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Free Paper Session 1

Long-term Results of Patients with Idiopathic Congenital Unilateral Club-foot Treated by Ponseti Method

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Clubfoot has historically been treated by serial plaster castings (Kite's method) and by surgical methods (soft tissue releases). The recurrence of these procedures and stiff and painful foot in long term was common. Presently, Ponseti method is most accepted method for treating clubfoot worldwide. Literature shows that the immediate results are good, but has only few literature support for the long term results. This study evaluates the long term functional and cosmetic outcomes of Ponseti method in patients with idiopathic congenital clubfoot.

Materials and methods: Thirty three feet (26 males and 7 females) treated by Ponseti method at our centre between January 2002 and December 2009 were included in this retrospective study. The details of history, Pirani Score, Laaveg–Ponseti functional score were collected.

Results: The mean age at follow-up was 10.5 years (range 8–16 years) with male to female ratio being 3.7:1. In 85% of the patients, treatment was started within 2 months of age and in 3 patients after 4 months of age. The mean Pirani Score at the start of treatment, 5.35 ± 0.73, improved to a good extent 0.59 ± 0.48, which was statistically significant ($p < 0.05$). The mean Laaveg and Ponseti score was 89.06 ± 7.03, which came in the range of good to very good as per the scoring. Two children showed poor results probably due to lack of compliance with Foot Abduction Brace. There was no statistically significant association seen between Laaveg and Ponseti Grading and age at follow-up ($p > 0.05$) and with age at which treatment started ($p > 0.05$), showing that Laaveg–Ponseti grading is independent of the age of the patient and age at which the treatment started.

Conclusion: Ponseti method, which consists of weekly serial manipulation, casting, tenotomy and use of foot abduction brace for minimum 4 years gives good cosmetic and functional results in idiopathic congenital clubfoot, which is shown by Pirani score and Laaveg–Ponseti score in the literature and in present study. Proper detailed explanation to the parents about the importance of casting andbracing, teaching them how to use the brace with strict follow-up increases the chances of good results in long term.

Functional and Radiological Outcomes of Internal Fixation in Closed Lisfranc Fracture Dislocations: A Case Series of 28 Patients

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Background: Aim of this study was to assess functional and radiological outcomes of surgical management of all types of Lisfranc fracture dislocations.

Materials and methods: Twenty-eight prospective cases of Lisfranc fracture dislocations treated surgically with a follow-up period of 12 months were reviewed. Patients were classified using Myerson classification. Modality of fixation was decided after assessing the type of injury and amount of displacement. Out of 28 cases, 10 were fixed with K-wires, 4 with bridge plating and remaining 14 were fixed with combined methods. Patients were evaluated for functional outcomes with AOFAS midfoot score and SF36 score. Radiological assessment was performed by measuring talus-first metatarsal angle on antero-posterior and lateral radiographs.

Results: It was observed that mean total AOFAS scores improved significantly from 23.71 at 6 weeks to 68.29 at 6 months and further to 78.04 at 1 year follow-up. A statistically significant difference was observed in Talus-first metatarsal angle on lateral view on preoperative and 1-year follow-up radiographs. Five incidences of complications were observed, which included 2 cases of early midfoot arthritis, 2 cases of persistent pain and 1 case of surgical site infection.

Conclusion: Primary surgical intervention in Lisfranc fractures gives satisfactory results. Anatomical reduction is associated with significantly better functional outcomes at the end of one year. Larger comparative groups and long-term follow-ups are needed to establish superiority of one modality over the other.

Subtalar Joint Preparation Using Two-portal Posterior Arthroscopic Technique vs Sinus Tarsi Open Approach: A Cadaveric Study

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Materials and methods: We used 19 below knee fresh-frozen cadaver legs for this cadaveric study. Subtalar joints of ten specimens were prepared through the arthroscopic approach, while the remaining nine joints were prepared using sinus tarsi incisions. After the completion of preparation, all ankles were dissected open, photographic images of calcaneal and talar articular were taken. Surface areas of each articular facet and prepared area of the talus, distal tibia, and distal fibula were measured and analyzed.
Results: Open technique resulted in better preparation of joint surface in calcaneus and overall. While open technique resulted in preparation of 92.3% joint surface (combined talus and calcaneus), arthroscopic technique resulted in 80.4% of joint surface ($p = 0.010$). Open technique resulted in better preparation of calcaneus (94.0% vs 78.6%, $p = 0.005$). The anterolateral corner of calcaneus was difficult to be reached using the scope and unprepared in most cases. There was no significant difference in the preparation of talar articular surface ($p = 0.071$).
Conclusion: Open sinus tarsi results in more joint preparation compared to two portal posterior arthroscopic technique. The less amount of joint preparation in arthroscopic technique is mostly due to less preparation of AL corner. Of calcaneus. When using posterior arthroscopic technique, it is advisable to use accessory portal to distract the joint to aid in adequate preparation.

Management of Displaced Calcaneal Fractures by Minimal Internal Fixation with Sinus Tarsi Approach

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Calcaneus is the most commonly fractured tarsal bone. The optimum treatment for any displaced calcaneal fractures involving posterior facet is surgical mainly. Due to risk of wound complications and sural nerve injuries, the extensile lateral approach is less preferred now a days. Various minimal invasive approaches such as sinus tarsi approach, limited posterior approach, percutaneous approach have been introduced.
Materials and methods: Total 48 cases of displaced calcaneal fractures were studies during June 2016 to April 2019. All the cases were treated with sinus tarsi approach. All cases operated in lateral position. 35 Male and 13 patients were female. Mean age group was 13 years to 65 years. Mean surgical time was from 7 days to 3 weeks after the trauma. Pre and postoperative and after one year CT scan done in all cases. The minimal internal fixation method was used with 4 mm cannulated cancellous screws, small reconstruction plate, k wires. Radiological evaluation done with AP, Lat and axial calcaneal views.
Results: All the patients were followed regularly after 3 months, 6 months, 1 year and 3 years. Radiological evaluation done at each follow-up. Weight bearing advised after three months. 3 cases superficial infection at k wire site, 3 cases varus deformity.
Conclusion: The management of displaced calcaneal fractures by sinus tarsi approach is a safe and effective treatment for displaced calcaneal fractures with minimal rate of complications. It is important to have adequate stable reduction of posterior facet, prevent varus reduction, and maintain width of the calcaneus.
Keywords: Calcaneal fractures—sinus tarsi approach.

Functional Outcome Following Fixation of Closed and Type 1 Open Tibial Pilon Fracture Using Locking Compression Plate

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Tibial pilon fractures are common and account for fewer than 10% of all lower-extremity fracture. The main aim of this study was to assess the functional outcome following treatment of pilon fractures with locking compression plate (LCP) and also to analyse the complications. Twenty five cases of closed and type 1 open pilon fractures were operated with LCP during August 2016 to March 2018 at our institute. Functional outcome was assessed using American orthopaedic foot and ankle society score (AOFAS) and visual analogue scale (VAS) at 3, 6 and 12 months postoperatively. At 12 months, the mean AOFAS was 84.24. Five patients (20%) had score more then 90 (excellent), 11 (44%) had score between 81–90 (good), 8 (32%) had score between 71–80 (fair) and 1 (4%) had 70 (poor). Mean AOFAS score improved from 71.36 (at 3 month) to 79.96 (at 6 month) and 84.24 (at 1 year). Mean VAS score at the end of 1 year was 22.4 mm. 17(68%) cases in the study had fracture union without any complications.8 (32%) cases had postoperative complications ranging from superficial wound infection to delayed union and secondary arthrosis. Tibia pilon fractures are challanging injuries. A constant balance has to be maintained to get anatomical reduction with minimal soft tissue handling. In a closed and type one open fracture low profile LCP is best option.

Study of Medial Column Injuries in Lisfranc Fracture–Dislocation

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Lisfranc injury is named after Jacques Lisfranc, a field surgeon in Napoleon's army. Based on columnar classification of Lisfranc fracture dislocation, study of injury to medial column was carried out as they have the potential to be a severe cause of residual disability in the foot if not properly treated at the initial stage. Importance of medial column is that it forms the highest point of longitudinal arch and may be injured in isolation or in association with lateral and middle column. Complex deforming forces may cause unusual pattern of medial column injuries at more than one level. There is renewed interest in this injury over past decade as modalities of treatment have changed over a period of time from conservative to fixation with K-wires to rigid fixation with screws to fixation with absorbable screws or combination of above. We present 21 cases of medial column injuries in Lisfranc fracture–dislocation. Age ranged from 18 years to 65 years. All were male. Four fixed with compression screws,12 fixed with K-wires, 2 managed conservatively, 3 were neglected cases. Postoperatively POP back splint was given, K-wire removal at 8 weeks, screw removal after 12 weeks and partial weight bearing started at 8–12 weeks. Follow-up ranged from 3 months to 3 years.

They were graded on basis of residual pain, foot shape, and movements. Best results were seen in cases where rigid intertarsal/intercolumnar stability was achieved by screw fixation. There was residual intercuneiform subluxation in 4 cases, which were fixed with K-wires, and this led to residual pain. Conservative/neglected cases had poor results. Intercolumnar/intertarsal instabilities should be primarily recognized and stabilized under compression. Stabilization should not only be within the 3 columns but also intercolumnar, thus maintaining the relative length of three columns and hence reconstitution of medial longitudinal arch.

Endoscopic Excision of Os Trigonum in Symptomatic Ballet Dancers of Odisha: A Prospective Cohort Study

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Background: The purpose of this study is to show that endoscopic excision of os trigonum results in early return to professional activity, better cosmesis and less wound complications.
Materials and methods: Between october 2016 and January 2019, 30 ankles of 20 consecutive patients underwent arthroscopic removal of the symptomatic os trigonum in prone position. Five points were male 15 female. All patients were ballet dancers by profession. Mean duration of postoperative follow-up was 24 months and no patients were lost to follow-up. Clinical evaluations were performed using the American Orthopaedic Foot and Ankle Society (AOFAS) ankle—hind foot score and the visual analoge scale (VAS) for pain. The time to return to profession (dancing) was assessed.
Results: Average AOFAS ankle hindfoot score increased from 45 preoperative to 95 postoperative and VAS for pain decreased from 8 to 1. Average plantarflexion of the ankle increased from 10° to 45° postoperatively. Mean time to resumption of activity and dancing was 9 weeks (range 6–12 weeks). There was no major complications in any patients.
Conclusion: Arthroscopic excision of a symptomatic os trigonum using posterolateral and medial portals in prone position was a safe and effective technique.

A Minimally Invasive Surgical Approach with Percutaneous Screw and/or Plate Fixation for Sanders Type 2 and 3 Intra-articular Calcaneal Fractures: A Prospective Study of 45 Patients

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A minimally invasive surgical approach with percutaneous screw and/or plate fixation for sanders type 2 and 3 intraarticular calcaneal fractures: a prospective study of 45 patients. Open reduction and internal fixation (ORIF) of calcaneal fractures using an extended lateral approach results in soft tissue disruption and therotically sutalar joint stiffness while those treated by closed reduction and percutaneous pinning cannot addressed all the intraarticular fragments sufficiently. The objective of our study is to evaluate restoration of subtalar joint and functional outcomes in intrarticular displaced sanders type 2 and 3 calcaneal fractures treated with a minimally invasive sinus tarsi approach for posterior facet exposure and percutaneous screw and/or plate.
Materials and methods: Fourty five intraarticular calcaleal fractures in fourty patients from sep 2016 to june 2018 were treated with percutaneous screw with or without plate fixation via sinus tarsi approach. All calcaneal anatomical parameters, including height, width, length, Bohlers angle and Gissane angle were measured by X-ray before and after surgery. Postoperative lateral wound healing was also evaluated and clinical functional outcomes were graded using the Maryland foot score. All patients had been followed up for an average of 12 months ranged from 3 months to 24 months.
Results: Maryland foot score demonstrated that excellent result was achieved in 38 cases, good in 05 cases, fare in two cases, and the excellent and good rate was 95%. An average complication rate of minor wound complications of 3% was reported and major wound complications in 0.7%. X-ray indicated satisfactory restoration of calcaneal height, width,length, Bohlers angle and Gissane angle.
Conclusion: Our results suggest that minimally invasive sinus tarsi approach with percutaneous screw and/or plate fixation technique for the treatment of intraarticular calcaneal fractures sanders type 2 and 3, cannot only obtain the satisfactory outcomes, but also can effectively prevent surgical complications.

Clinical Outcomes Following Double Osteotomy (Scarf and Akin) for Hallux Valgus Deformity

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Objectives
Evaluate the outcomes of osteotomy procedures around the great toe.
This Involved assessing:
Operation success rates.
Superficial wound infections.
Improvement in symptoms after the operation.
Materials and methods: Type of study: retrospective cohort study. Time period of study: November 2014 and December 2018. Data extraction: Data was collected using clinical portal for patient information, hospital interactive system and PACS (picture archiving and communication system) for assessing first MTP joint X-rays. Three components were assessed as follows: Success rate – using the AOFAS Foot and ankle scoring system.
Wound infections were used to assess infection rates – using the CDC criteria
Patient satisfaction – Using SF-36 Forms.
Results: The study involved 210 feet from 200 patients (10 bilateral feet). Patient group 75% females and 25% males (3:1) ratio. The cohort had a median age of 55. Radiological assessment of Hallux valgus included 40% (25°) 52% (25–40°) and 8% (50°). There were 20 further surgeries

due to the failed first surgery. Of this 12 had arthrodesis and 8 had arthroplasty. In terms of postoperative pain-free symptoms 158 patients were pain-free, 27 had minimal pain and 15 had moderate to severe pain.
Conclusion: The success rate, wound infection and improvement in symptoms after surgery were in favour of this procedure for Hallux Valgus deformity.

Maceira's Triple Weil Osteotomy

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Purpose of the study: To compare the maceira's triple weil osteotomy, a modification of weil osteotomy in 3rd rocker metatarsalgia, stabilized by fixation and without fixation, with respect to functional outcomes and complications.
Materials and methods: We studied retrospectively 45 feet of 42 patients, who were performed triple weil osteotomy between 2016 to 2018, in Hospital De Mataro, Barcelona, Spain. The surgical treatment done by three surgeons, in all cases surgeons performed the same surgical technique, except two of the surgeons did not fix the triple weil osteotomy and one performed triple weil osteotomy with fixation as originally described. 40 feet were associated with hallux valgus which was treated accordingly with distal and proximal osteotomies and 5 feet were metatarsalgia alone. 17 osteotomies were fixed with screw and no fixation done in 28 feet. The mean follow-up was 12.4 months and 13.1 months respectively.
Summary of results: All patients were evaluated clinically by using AOFAS LMI scale, the mean scores were 70.05 (24–95) and 67.25 (54–95) in fixation group and without fixation group respectively ($p = 0.11$).
Complications: 11 patients with deformity recurrence, 3 patients parabola disturbance, in 8 progression of hallux valgus and 2 patients had radiological nonunion without symptoms.
Conclusion: The result of maceira's Triple weil osteotomy fixed and without fixation were comparable and main complications did not show significant relationship.

Management Strategy of Nonidiopathic Clubfeet in Reference to Ponseti Methods: A Prospective Study

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Background: The management of idiopathic clubfoot with Ponseti method is well documented. However, the management of non-idiopathic clubfoot is more challenging as these feet have been considered more rigid with a higher rate of recurrence. We sought to find if this method could be reproduced in the Indian scenario for non-idiopathic one at tertiary referral institute.
Methods and results: Thirty five patients were evaluated with 51 non-idiopathic congenital clubfeet that had been treated with the Ponseti method in institute from 2012 to 2017. Recurrence and failure cases were subjected to surgical intervention in form of limited posterior or posteromedial soft tissue release. The common associated anomalies were meningomyelocele (15) and arthrogryposis multiplex congenita (8). Mean age for treatment initiation was 30 weeks with 160 weeks of mean follow-up of treatment. The mean number of casts was 16. Thirty four out of the 51 (67%) clubfeet underwent a percutaneous Achilles tenotomy. Recurrence occurred in 30% cases required different surgeries. The average time to recurrence was 14 months (range = 9–20 months).
Conclusion: Ponseti method should be the first line of treatment for all clubfeet, irrespective of etiology. Recurrence rate has been higher, but deformity improved with recasting in most cases. In our experience, once a complex clubfoot is corrected, the rigidity of the soft tissue lessens, the skin creases and puffiness disappear and the foot develops normally.

To Evaluate the Functional Outcome of Suture Button vs Screw Fixation in Syndesmotic Injuries

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Syndesmotic injuries are found in 10% of the ankle fractures and should be evaluated both clinically and radiologically and treated so as to prevent delayed complications like loading failure. Syndesmotic screw fixation is the standard fixation technique but with the advent of fibre wire, the tight rope technique with endobutton has gained the attention of the foot and ankle surgeons. Thirty patients (15 in each group) within the span of 2 years who underwent either standard syndesmotic screw fixation or suture button fixation were selected for the study after meeting the inclusion criteria. The mean age of the patients in tight rope group was 44.5 years and in screw fixation group it was 46.8 years. The average time of non weight bearing in the tight rope group was 4.8 weeks whereas it was 6.2 weeks in the screw fixation group. The functional outcome was assessed using AOFAS score and follow-up was done for 2 years. Patients with suture button fixation showed better results in terms of immediate postoperative weight bearing, early rehabilitation, range of movement of ankle joint, shorter learning curve for the surgeon. The cost of the tight rope being the only reason not favoring the technique and there were no soft tissue complications noted.

Reliability of Smart Wearable Device Pheezee vs Other Traditional Devices in a Podiatric Setting: A Comparative Study

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In this paper, we describe the methods and experiments done on healthy subjects to measure the range of motion (ROM) of the ankle while performing exercises in real-time using a novel wearable device, Pheezee, a product of Startoon labs. Pheezee is equipped with an onboard ARM microcontroller and motion sensors for data acquisition and processing to measure the range of motion. Pheezee consists of two modules, one to be worn above the ankle and the other below the ankle. The device is connected wirelessly with an android phone to measure ROM in real time while exercising. The device has the least count of 1° for ROM measurement. Tests were done on 20 healthy subjects to measure ROM while performing dorsiflexion and plantar flexion. The results were compared with a traditional CE certified goniometer

and digital goniometer app, Goniometer Records (released by Indian Orthopaedic Research Group) and found an accuracy of 96% for ROM measurements. Thus, it is concluded that, unlike the traditional devices to measure static ROM, Pheezee can be used to measure dynamic ROM accurately for foot and ankle movements.

Guest Nation

Peroneal Tendoscopy

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Tendoscopy of the peroneal tendon is a promising procedure for the treatment of peroneal tendon pathology and its disorders. This procedure is minimally invasive with less physical morbidity and early functional rehabilitation. The present report demonstrates the techniques of peroneal tendoscopic debridement and endoscopic groove deepening in the prone position to treat peroneal tenosynovitis and low-lying muscle belly of peroneus brevis with a shallow and flatsurface of the retromalleolar groove.

FREE PAPER Session 2

Effect of CT on Management Plan in Malleolar Ankle Fractures

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Purpose of study: Conventionally ankle fractures have been classified using plain radiographs. Because of complex 3-dimensional anatomy and complexity of injuries, plain radiographs may not always be able to clearly depict the complete fracture pattern. There is a paucity of studies regarding the utility of computed tomography (CT) scanning in malleolar ankle fractures (MAFs). Hence, we conducted this study to further understand the role of the CT scan in MAFs.
Materials and methods: A prospective study of 56 consecutive malleolar ankle fractures was conducted. In the first evaluation by a team of 3 observers, a management plan was made based on plain radiographs. All patients received a CT scan evaluation with a standard protocol. The second evaluation by the same team included formulating an operative plan based on the CT.
Results: In 13 (23.2%) cases, the management plan changed after CT evaluation. In most of the cases, the change in the management plan included an alteration in fixation of the posterior malleolus followed by lateral malleolus in 4 cases. Most of the changes took place in AO 44 type C followed by types B and A. Maximum change was noted in trimalleolar fractures followed by bimalleolar and unimalleolar. The most common morphological characteristic fracture identified on CT scan that was not evident on plain radiography was Chaput fracture in 17 cases.
Conclusion: CT scan evaluation of MAFs changed the management plan in a significant number of cases, especially if the fractured fragment included a posterior malleolus, AO type C, and/or if 2 or more malleoli were fractured as noted on plain X-rays.

Bilateral Calcaneus Fracture: A Prospective Study Comparing Operative vs Nonoperative Management

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Introduction: Current literature suggests that operative intervention in bilateral calcaneum fractures does not lead to significant benefits in both subjective and objective functional outcomes. However, data on bilateral calcaneal fractures is sparse with just two major studies being published so far looking at post treatment outcomes of bilateral calcaneal fractures. Operative intervention in bilateral calcaneum fractures depends on fracture morphology and soft tissue condition and when chosen appropriately, significantly improves functional outcome. The primary objective of this study was to assess the functional and radiological outcomes between operative and nonoperatively treated bilateral calcaneal fractures. Secondary objective was to compare the functional outcome of bilateral calcaneal fractures treated operatively with unilateral calcaneal fractures also treated operatively.
Materials and methods: Twenty-three patients sustaining bilateral calcaneum fractures in the age group of 18–60 years during the time period June 2013 to December 2014 were enrolled in the study out of which 17 patients (34 feet) completed follow up. Preoperative radiographs and computerised tomograms were done to classify fractures according to Essex-Lopresti and Sander's classifications respectively. Each individual fracture was treated conservatively or operatively depending on the type of fracture, time duration at first presentation, soft tissue condition and associated injuries as decided by the primary surgeon. These patients were followed up for a mean period of 11.7 months (range: 7–18 months). Primary outcome was hindfoot pain and function assessed by AOFAS (American Orthopaedic Foot and Ankle Society score) scoring. Secondary outcomes were degree of correction in Bohler's angle and complications. The functional outcomes of bilateral calcaneal fractures treated operatively were also compared to the functional outcomes of 13 unilateral calcaneal fractures which were treated operatively as part of a larger study.
Results: 18.75% (n = 4) were extra articular fractures. Among the intra-articular fractures 9.38% had type I (n = 3), 40.62% type III (n = 14), 31.25% type IV (n = 13). All extra articular fractures and Sander's type I fractures were treated conservatively. All Sander's type II and III fractures and 50% of sander's type IV fractures were treated operatively (by both MIS and Extensile approaches). All patients had a statistically significant improvement in bohler's and gissane's angle post surgery (p = 0.001) in both unilateral and bilateral groups and there was no difference in operatively managed Unilateral and Bilateral cases (p = 0.94). The outcomes assessed in terms of AOFAS hindfoot scores were good to excellent in all cases. Operatively managed bilateral fractures had comparable clinico-radiological outcomes when compared to unilateral fractures in when each foot is evaluated separately.
Discussion and conclusion: The outcomes of both operative and nonoperative management acceptable (AOFAS good to excellent) provided each foot is chosen appropriately in the operative and nonoperative groups based on fracture morphology, classification and soft tissue status. The Bias of nonoperative management of bilateral calcaneus fractures as proposed by pre-existing studies should no longer be propogated. Eachfoot should be individually assessed for operative vs nonoperative management for optimising the functional outcome.

Displaced Intra-articular Calcaneal Fracture Management with Box Configuration: Can it be an Alternative?—A Prospective Study of 20 Cases

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Introduction: Extensile lateral approach is considered workhorse approach with superior construct strength but wound complications (15–20%)and timing for surgery are drawbacks. MIS can be an alternative interms of wound complications and timing for surgery but construct strength is questionable. Dual plating is considered as an alternative only for construct strength. A need for alternative in terms of wound issues, timing and construct strength is needed.
Aim: To study the radiological and functional outcome of displaced intraarticular calcaneal fracture with box configuration in 20 cases.
Materials and methods: A total of 20 cases of sanders type II and III are included with ages of 20–60, operated by single surgeon on day 1–2 of reporting in a single center. All cases are managed with sinus tarsi approach and box configuration.
Results: Radiological outcome assessed by Bohlers angle, Gissane angle, posterior facet ht and angle, calcaneal width and length, at around 18 months showed no loss of reduction, functional assesment done by routine follow-up and questionaire with aofas score showed a mean score of 90/100 at 18 months. When compared with ELA and dual palting, box configuration has no loss of reduction, no wound complications, all cases are operated on day 1–2, and construct strength is on par.
Conclusion: Box configuration with sinus tarsi approach can be considered an alternative as it provides the required strength, and allows to be operated on day 1–2 and no wound issues.

Calcaneum Fracture Management through Sinus Tarsi Approach

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Background: The aim of study is to observe postoperative outcomes and morbidity of the anatomically reduced displaced Intraarticular calcaneus fracture (DIACFs) using sinus tarsi approach.
Materials and methods: Twelve closed displaced Intraarticular calcaneus fracture (DIACFs) were included in study. All cases are operated through sinus tarsi approach. Postoperative assessment was done using American Orthopaedic Foot and Ankle Score (AOFAS) and radiological angles of Gissane and Bohler.
Results: (1) In 10 cases wound underwent primary uneventful healing, in 2 cases wound gap occurred which required surgical debridement. (2) In all cases Bohler's angle improved from preoperative mean 15° (range 0–28) to postoperative mean of 32° (range 22–42) and Gissane's angle improved from preoperative mean 140° to postoperative mean of 125°. (3) *p* value for restoration of Gissane angle and Bohler's angle ≤0.001. (4) No case required local tissue flaps or skin grafts during healing. (5) No case showed implant failure. (6) One case showed peronei impingement. (7) On last follow up, AOFAS SCOREs of 10 cases were excellent and 2 cases were fair.
Conclusion: Sinus tarsi approach is an excellent approach which favors early surgical intervention, excellent exposure to intra articular fracture of calcaneus with less postoperative wound morbidity and excellent clinical outcomes after fixation.

Fiber-wire Fixation for Ankle Syndesmotic Injury

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Background: Ankle syndesmotic injury are complex in regard to diagnosis and require anatomic reduction and fixation to restore the normal biomechanics of the ankle joint and prevent long-term complications.
Materials and methods: Ten patients with ankle syndesmotic injury underwent treatment with 01 fiber wire and 02 endobutton. Bony fixation was done with standerd technique. Postoperative evaluation was done with aofas score and radiographic evaluation of tibio-fibular clear space.
Results: Ten cases were followed up for 06 months. The mean age of 10 patients was 30.4 ± 11.79 (range 18–53) years. Most common mechanism of injury was found to be road traffic accident (60%). According to lauge-hansen classification, pronation-external rotation (50%) is the most common type. Tibio-fibular clear space 1 cm proximal to tibial plafond in preoperative period was 5.9 ± 0.7 cm and 3.7 ± 0.64 cm in postoperative period. Mean AOFAS score was 82.5 ± 7.5 at 06 month. 01 patient (10%) developed superficial infection which was treated with oral antibiotic.
Conclusion: Fiber wire fixation with endobutton is a semi-rigid fixation for ankle syndesmotic injury and helps in early mobilisation. Technique is simple, minimally invasive, do not require routine removal. There was no failure of syndesmotic fixation despite early ankle range of movements exercise and weight bearing in postoperative period.

Gait Analysis and Functional Outcome after Surgical Treatment of Patients with Calcaneal Fractures

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Need for the study: The objective functional outcomes along with gait analysis following calcaneal fracture fixation are hitherto unpublished. The present study is undertaken to study the radiological, functional outcome and gait pattern changes for patients in whom calcaneal fracture fixation has been performed.
Materials and methods: The current study involved 18 patients with post traumatic intra-articular calcaneal fractures operated with open reduction and plating using extended lateral approach. Postoperative assessment by radiological X-ray and Gait analysis with GaitRite mat and AOFAS/IFAS scoring was done at regular intervals.
Results: All 18 patients had good union of fracture at the end of 12 weeks and postoperative Gait analysis showing a mean FAP score of 92 which is nearly normal, with the mode being 100 and the restoration of the calcaneal angles on xray was nearly normal, both of which correlated with the post operative AOFAS score mean of which being 78 ± 10 at a mean follow-up period of 24 months.
Conclusion: This study demonstrated that postoperative gait and the radiological findings of the patient and subjective functional outcome were found to be near normal whenever a good intra-articular reduction was obtained and showed the need for internal fixation of intraarticular calcaneal fractures to be necessary to obtain good results with early return to normalcy.

Functional Outcomes of FHL Transfer for Chronic Insertional Achilles Tendinosis

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Objective: The purpose of this study was to evaluate functional outcomes of FHL transfer for Chronic Insertional Achilles Tendinosis by assessing Ankle Range of motion, AOFAS Hind foot score, single heel raise and level of satisfaction of patients
Materials and methods: Thirteen patients with persistent chronic Achilles tendinosis were diagnosed and underwent for surgery. After surgical reconstruction patients were evaluated At the time of follow-up for Ankle Range of motion, AOFAS Hind foot score, single heel raise and their level of satisfaction (Very Good, Good, Fair, Poor).
Results: We found no loss of plantarflexion and dorsiflexion of ankle. The study population scored an average of 84/100 for the total AOFAS-AH score post-repair. The average VAS decreased from 7.5 preoperative to 1.2 postoperative. 11 out of 13 were satisfied with their outcome (rated Very Good or Good), two patients rated their outcome as Fair and none as Poor.
Conclusion: Excellent functional and clinical outcomes including significant pain reduction For individuals with chronic insertional Achilles tendinosis for FHL transfer procedure.

Endoscopic Management of Retrocalcaneal Pain: A Prospective Observational Study

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Background: Retrocalcaneal pain is a disabling condition that responds well to the conservative methods of treatment. Patients who do not respond to conservative treatment may require surgical intervention which includes excision of the inflamed bursa, resection of calcaneal tuberosity. However open surgery have increased complication rates. This study evaluate results of endoscopic management of retrocalcaneal pain.
Materials and methods: Our prospective study included twenty patients with chronic pain in retrocalcaneal space for which nonoperative treatment had failed and endoscopic management was performed. The mean age was 45.25 years (range 28–65 years). Prone position, two portals were created, one laterally and one medially, over the posterosuperior portion of the calcaneus to gain access to the retrocalcaneal space. The inflamed bursal tissue was removed, and the prominent bone was resected. Patients were evaluated preoperatively and postoperatively with the American Orthopaedic Foot and Ankle Society (AOFAS) Ankle-Hindfoot scale.
Results: The AOFAS score mean 65.6 preoperatively and 96.8 postoperatively ($p < 0.001$). There is a steep learning curve with the endoscopic procedure. The first procedure took approximately one and half hour, whereas the operative time at the end of our investigation was averaging thirty minutes. Only two complication occurred: a postoperative neuralgia and one postoperative swelling with scar tenderness. There were no postoperative infection.
Conclusion: The endoscopic technique of decompressing the retrocalcaneal space reduce the morbidity and decrease the time to recovery for patients with retrocalcaneal bursitis and haglund deformity. Sufficient exposure of the Achilles tendon and removal of the calcaneal prominence and retro calcaneal bursa can be done effectively using an endoscopic technique with low complication rate.

A Study of Functional Outcome of Contoured Plate Fixation in Displaced Intra-articular Calcaneum Fractures

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Aim: To find the functional outcome of intra-articular calcaneal fractures treated with contoured plating, mean duration of union, improvement on Bohler's and Gissane's angles and associated complications.
Materials and methods: Study was carried out in the Department of Orthopedics, Father Muller's Medical College, Mangaluru from May 2015 to August 2017. Twenty five patients with intra-articular calcaneum fractures, treated with contour plating using 3.5 mm reconstruction plate within 14 days of injury were included and followed up at 3, 6 and 12 months. Functional outcome was assessed by "American Orthopedic Foot And Ankle Society Ankle Hindfoot scoring system".
Results: The average age of patients was 37 years and all were males. Fall from height was the commonest mode of injury with left calcaneum more commonly involved. Fracture classification was based on Sander's and Essex-Lopresti method. All were joint depression type fractures, of which 8 were Type II Sander's and 17 were Type III. Functional outcome was better in Sander's Type II fractures. 22 out of 25 had signs of radiological union on second follow-up. The average time for union was 12.78 weeks. Two fractures had delayed union, one failed to unite secondary to infection. The functional outcome was good in 16 patients, fair in seven and poor in two. Complications with plating were more in Sander's type III fractures with lower preoperative Bohler's and higher Gissane's angle.
Conclusion: Contoured recon plate fixation is good in terms of union of the fracture, attaining anatomical reduction and better functional outcome.

Ankle Arthroscopy with Brostrom

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Introduction: Ankle sprains are a common sports injury encountered by orthopaedic surgeons in office practice. While most injuries are treated successfully with conservative management, a few patients have pain and instability that persist, with a high incidence of recurrent sprains and early onset of arthritis. Several surgical options are available to manage chronic ankle instability, anatomical as well as non-anatomical. The procedure described by Broström-Gould is considered the gold standard anatomical procedure and has been used to address chronic lateral ankle instability. In this study we share our initial experience with this procedure.
Materials and methods: In the period from Mar 2014 to May 2019, 14 patients underwent ankle arthroscopy and Broström-Gould procedure for chronic lateral ankle instability, which had not responded to conservative measures for at least 2 years. The mean age of the patients was 22 years, all male, and all had sustained the injury during sports. A functional outcome score was completed on each patient, with a mean follow-up of 2 years (range, 1–2.5 years).
Results: The mean functional outcome score (AOFAS) was 98. And it was found that all patients went back to normal activities of daily living, and participated in recreational sports from 6 months following surgery.

Conclusion: Anatomical procedures such as Broström-Gould lateral ankle reconstruction are very useful in a fit and young population. In addition to providing stability, they also prevent repetitive injuries and early onset of ankle arthritis. A preliminary arthroscopy helps to assess the status of cartilage, look for any associated osteochondral defects and address them, in addition to removal of the offending loose bodies. With availability of better equipment and skills, it should soon be possible to replace the traditional open Broström procedure with arthroscopic repairs soon.

Retrograde Funnel Drilling Technique: A Study on Accuracy, Adequacy, Safety and Reproducibility in Treating OCD

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Retrograde drilling is done in early stages of OCD. Radiological classification of OCD is not comprehensive as it lacks information on overlying cartilage status. Sometimes even in stage III lesions majority of the overlying cartilage is intact keeping the fragment relatively stable. Fixing these fragments augmented with drilling is a good option. Retrograde drilling per se is a technically difficult procedure (even more for grade B or C type lesions as per arthroscopic classification. In cystic type where the subchondral bone is thin, drilling with single large drill caries the risk of damaging the intact cartilage.

Objectives: To devise an accurate, safe, adequate and easily reproducible technique of retrograde drilling for treating OCD with regular arthroscopic equipments and image intensifier (accurate to correctly reach the lesion; adequate to reach maximum area involved; safe not to damage the stability of cartilage and subchondral bone).

Materials and methods: Technique involves drilling a pilot guide pin under both image intensifier and arthroscopic guidance using femoral aimer zig. Cannulated reamer (size: 4.5 mm) is passed 10 mm short of the guide pin tip. Reamer removed retaining the pilot guide pin. A 1.2 mm K wire is passed in the same tunnel adjacent to the pilot guide pin and drilled in 8 different directions around the pilot guide pin till subchondral bone is reached under image-intensifier guidance and arthroscopic visualisation. The depth and diameter of the cannulated reamer determines the area covered. These variations were reconstructed in computer simulation of distal femoral 3D reconstructions. To assess the easy reproducibility of this technique three different surgeons performed this technique on bone models and the accuracy and adequacy was assessed. In our study, 10 joints with grade II and III OCD underwent retrograde drilling by this technique performed by a single surgeon. Follow-up ranges from 3 months to 3 years.

Results: Short term follow-up results of seven patients (10 lesions) showed good outcome. None of the patients had progression of cartilage damage intra-operatively during drilling or progression of stage of the lesion in radiological follow-up indicating the safety and efficacy of the technique. Guidelines were formulated for adequacy by computer simulation. Templates were designed as reference for surgeons. Bone model drilling by 3 surgeons proved the technique to be accurate and reproducible.

Conclusion: Retrograde funnel drilling is accurate, adequate, safe, efficacious and easily reproducible technique for treating OCD. Templates designed will aid surgeons plan and perform this technique easily.

Achilles Tendon Tears: Management in Elderly, Late Presenters, Degenerate and Diabetics by Minimally Invasive Approach

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Inadequate healing potential of elderly, late presenting, degenerative and diabetic patients with Achilles tendon rupture suggests the need for treatment by debridement and augmentation procedures. Extensive surgery poses an extra risk in such patients.

Objectives: An attempt was made to replicate the results of percutaneous repair in cases of Achilles tendon rupture where a poor healing potential was anticipated: the elderly, late presentation, history of degenerative tendinitis, or diabetics. Recommendations for modifications in the technique were identified.

Materials and methods: Fifteen cases of Achilles tendon rupture, who were either over 58 years of age, or injury more than 4 weeks in duration, or had a history of degenerative tendinitis, or were diabetic, were taken for surgery. A percutaneous technique was used to pass a suture through the proximal tendon. A minimally invasive incision was used to expose the rupture and pass the suture through the distal tendon or calcaneum. Approximation was done and immobilization was given immediately. The postoperative protocol was modified, taking into consideration the selection criteria.

Results: Twelve patients were found to have excellent to good results; two patients had reduced comparative tendon strength. There was one case of suture infection in a diabetic.

Conclusion: The minimally invasive technique of Achilles tendon repair, with modifications, is an effective method of treatment for ruptures in cases where poor healing potential is perceived.

Funding: None

Role of Arthroscopy in Preoperative Evaluation and Management of Osteochondral Injuries in Acute Ankle Fractures

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Introduction: Ankle fractures are the second common lower limb fractures representing 10% of all fractures. These patients present with disabling pain despite restoration of congruity by fixation which could be due to missed intraarticular injuries. Aim of our study was to assess osteochondral injuries in acute ankle fractures arthoscopically and to investigate the incidence of ligament injuries and their causal relationship with the type of fracture.

Materials and methods: It was the prospective study, done at Indian Spinal Injuries Centre for the period of 1 year. All patients with closed ankle fractures with <3 weeks duration were included. After primary treatment, ankle arthroscopy planned to assess and manage osteochondral lesions, loose pieces, and ligamentous injuries.

Results: Total 16 cases (12 males and four females) were done in this study. Osteochondral lesions of the cartilage were found in 6 cases (38%),

distal tibia was involved more than talus, fibula/medial malleolus. Pa value in this study –0.3571 which was very high compared to normal range Pa value—0.001379. According to Fisher exact test, osteochondral lesions did not depend on the type of fractures. There were no major complications reported. The anterior tibiofibular ligament injury was seen in 6 cases (38%) and the syndesmotic screws were used.

Conclusion: The associated lesions of cartilage and ligament injuries remain a diagnostic challenge in acute closed ankle fractures. An arthroscopy is a useful tool for preoperative evaluation and simultaneous management of osteochondral and ligament injuries in acute ankle fractures.

Percutaneous Repair of Tendo-Achilles Tear under Local Anesthesia: A Series of 21 Cases

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Introduction: Closed rupture of tendo-Achilles is a troublesome injury. Closed tears can happen in any age group. Elderly people with medical comorbidities are more prone for injury. Various techniques for repair have been proposed. Due to various local factors open repair caries an inherent risk of wound complications. Hence a study is being conducted to assess percutaneous tendon repair under local anesthesia.

Materials and methods: A total of 21 patients were being done percutaneous repair of tendo-Achilles tear by Maa and Griffith technique during May 2011 to June 2013. The procedure was done under local anesthesia. A postoperative cast was given for 6 weeks followed by walking cast for 4 weeks.weight bearing started with supports by 8–10 weeks. Gradual mobilization started by 10–12 weeks. Mean age of patients was 36. Mean followup was 12 months. The patients were analyzed for return of activities, range of motion, and functional assessment.

Results: There was 1 case of wound necrosis. All others had excellent results with only 2 patients had dorsiflexion restriction. All patients were able to return to daily activities by 15–18 weeks.

Conclusion: Considering overall results this is a good surgical technique with satisfactory better results with early return to daily activities.

Evaluation of Hallux Valgus Deformity Correction Using Adjustable Suture Button

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Hallux valgus is the most common deformity of toes seen in outpatient department. There are many procedures described for correction of this deformity depending on severity. Many of them are aggressive procedure and, are associated with complications like wound infection, implant failure and recurrence of deformity. Mini-incision technique is required to avoid wound complications. We evaluated correction of deformity of patients with mild to moderate hallux valgus using adjustable suture button. Adjustable suture button gives the liberty to adjust intermetatarsal angle (IMA) intraoperatively. Total 8 patients (10 feet), 3 males and 5 females, with mean age of 26.10 ± 5.34 years, were treated with minimum follow up of 9 months (range 6–18 months). They were evaluated clinically and radiologically. Preoperative mean hallux valgus angle (HVA) was 30.50 ± 2.23° and IMA was 15.80 ± 1.23°. Medial and dorsal approach was used for all cases. Proximal phalanx closing wedge osteotomy was done in 2 cases. Postoperative HVA was 10.70 ± 2.21° and IMA was 6.30 ± 0.95°. No recurrence was seen at last follow up. No complications related to adjustable suture button or related to the procedure like surgical site infection and wound dehiscence was seen. Adjustable suture button is a less invasive and effective implant for correcting mild-to-moderate hallux valgus deformity, however more number of patients and longer follow-up are needed for further validation.

Talus and Time: An Institutional Experience

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Talar neck fractures have high incidence of complications like non-union osteonecrosis and posttraumatic arthritis. The purpose of this study is to assess the functional and radiological outcome of surgically managed talar neck fractures and to analyze the influence of time from trauma to surgery on the outcome. Eighteen patients were included in study and studied for a period of about 52 weeks. Outcome was analyzed with AOFAS scale and Lindvall et al. criteria. Mean AOFAS score was 81. Union rate was 79.8%. Nonunion in three patients arthritis in 13.4% and osteonecrosis in 13.4%. One patient underwent ankle arthrodesis and one underwent Blair fusion. The study shows reduced trauma to surgery time reduces incidence of osteonecrosis and gives better outcome.

Comparison of Clinical Outcomes of Simple Needling vs Needling with Autologous Blood Injection vs Intralesional Depomedrol Injection for the Treatment of Chronic Plantar Fasciitis

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Comparison of clinical outcomes of simple needling vs needling with autologous blood injection vs intralesional depomedrol injection for the treatment of chronic plantar fasciitis abstract.

Evaluation of Results Using Endoscopic Management of Haglund's Syndrome via Three-portal Technique

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Purpose: Our study is a prospective study to evaluate the three portal endoscopic calcaneoplasty technique for providing access to the retrocalcaneal space, allowing adequate endoscopic resection of haglund deformity, excision of retrocalcaneal bursa and Achilles tendon debridement.

Materials and methods: Patients of Haglund's syndrome who had proper trial of conservative treatment for at least 6 months duration and did not get adequate relief and opted for endoscopic surgical treatment were included in the study. Total 18 patients were (23 Heels) studied. Outcome was assessed by comparing preoperative and postoperative clinical scoring using ogilvie harris score, Maryland foot score and ankle and hindfoot scale (AOFAS) at 6 weeks, 12 weeks and 24 weeks.
Results and observations: Of the total of 23 heels, 2 patients lost in follow-up and 21 heels were assessed. According to Ogilvie-Harris score, of the 21 patients 6 (28.5%) had good while 15 (71.4%) showed excellent results at end of 24 weeks. AOFAS score was 56.42 ± 8.60 preoperatively which improved significantly to 91.67 ± 4.40 in postoperative period. Maryland foot score was 54.17 ± 5.84 preoperatively and was 94.50 ± 3.23 postoperatively at end of 24 weeks, the difference was statistically significant. No major complications were noted.
Conclusion: There was statistically significant improvement in patients operated via 3 portal endoscopic calcaneoplasty for Haglund's syndrome in terms of clinical and functional outcome.

Achilles Endoscopy for Insertion Tendinopathy in Haglund Deformity

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Haglund deformity is a common cause of heel pain in runners and common population. Conservative treatment is first line of management involving anti-inflammatory drugs, physiotherapy and others. Surgical management is indicated in almost 10% of cases. Surgical methods involve open debridement/reinsertion or endoscopic excision of bursa/spur excision. Open debridement has side effects involving wound dehiscence, prolonged rest and higher cost of treatment. We reviewed 5 cases of insertional tendinopathy treated endoscopically in prone position. Patient was allowed to bear full weight from next operative day. There was no need of any stitches after surgery. No postoperative complications were reported, achieving a complete satisfaction in all patients. There was a follow-up period of 1 year.

Effect of Distal Fragment Length on Stability in Distal Tibial Fractures Managed by Intramedullary Nailing: A Biomechanical Study

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Introduction: Interlocking nailing has gained popularity for internal fixation of extra-articular fractures of the distal tibia as it is minimally invasive, has the advantages of being a load sharing device and has fewer hardware related soft-tissue problems. However, malunion remains a significant problem, occurring in up to 28% of the cases. Although a lot of research has focused on factors that affect the stability of interlocked nail constructs, there is no study that addresses the effect of distal fragment length on stability in distal tibial fractures managed by interlocking nails.
Materials and methods: This was a biomechanical study on an extra-articular distal tibial fracture model in synthetic bones. Four study groups with 7 bones each were created on the basis of the length of the distal fragment. Group A had a distal fragment length of 12% of the total tibial length, group B—15%, group C—20% and group D—25% of the total tibial length. A transverse fracture with 1 cm gap was created and stabilized with an interlocking nail with 2 proximal and 3 distal interlocking bolts in all the bones. The stability was assessed using a servohydraulic machine, by three-point bending within the elastic range and phased, cyclic axial compressive loading. The outcome parameters included axial stiffness, mediolateral (ML) and anteroposterior (AP) bending stiffness, AP and ML neutral zones, AP and ML peak fracture gap angles and change in the fracture gap (micromotion) on compressive loading.
Results: Group A demonstrated significantly lower AP bending stiffness, higher AP neutral zone and higher AP fracture gap angle as compared to group D. There were no significant differences in any of the other parameters between any of the study groups. All constructs survived the cyclic loading protocol without any evidence of permanent deformation or fatigue failure.
Conclusion: We conclude that fractures with a short metaphyseal distal fragment (12% of the total tibial length) demonstrate significantly higher instability in the sagittal plane as compared to fractures with a long diaphyseal distal fragment (25% of the total tibial length). Hence, the surgeon must anticipate sagittal plane malunion problems when considering interlocking nailing for such fractures. Also, it may be justifiable to use additional support in the form of external bracing and restrict ankle range of motion in the early postoperative period to minimize the sagittal plane instability in such cases.

Hybrid Fixation of Fracture Distal End Tibia and Fibula: A Novel Method of Treatment

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Management of fracture of distal end tibia and fibula has always been an issue of controversy while conservative management may lead to malunion due to inadequate reduction on the contrary aggressive surgical treatment may lead to wound dehiscence. The subcutaneous nature of tibia makes it vulnerable to frequent injuries. The management with hybrid fixation, i.e., external fixation combined with limited internal fixation through principles of ligamento-taxis has proved to be a preferred method for these fractures either single or two staged procedure. We had treated 31 patients of these fractures who had been successfully treated and had given us good to excellent results in more than 83% patients. The clinical outcome was performed on the basis Tenny and Weiss score. Majority of the patients were either of type 43B or 43C. Radiological outcome was judged by Burwell and Charnley criterion and gave us almost 90% fair to anatomic reduction. It concludes the minimal invasive method along with hybrid fixation still holds the key for the good results.
Keywords: Fracture distal end tibia, Hybrid fixation, Minimal invasive methods.

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Mosaicplasty by a Modified Lateral Malleolus Osteotomy Approach for Osteochondral Lesion Talus: A Case Report

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Osteochondral lesions of talus more commonly affect the medial and anterolateral dome. These acquired/idiopathic lesions of the articular cartilage are least likely to affect the posterolateral part of the dome. Furthermore, if encountered, they are difficult to manage due to the limited surgical exposure. We report a case of idiopathic osteochondral lesion of the lateral talar dome in a 40-year-old male. He presented with recurrent ankle effusion and pain disabling his activities of daily living. He was managed osteochondral autologous grafting by a modified lateral malleolus osteotomy approach. Osteotomy site was fixed with 1/3rd tubular plate. Patient improved clinically and is asymptomatic now. Serial imaging showed good union of the osteotomy site, good defect filling and graft integration at the lesion.

Foriegn Body-induced Infection Mimicking Tuberculosis: A Diagnostic Challenge and Management

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Osteo-articular tuberculosis has been the great masquerade since this is known to mankind. The osteo-articular tuberculosis still remains a major problem in our country and other developing countries. Incidence of bone and joints tuberculosis is 1–3% only and this rarely affects foot. Osteo-articular tuberculosis mimics many other diseases and also mimicked by other diseases very closely i.e., tumors, chronic infections, fungal infections, parasitic infections etc. which poses difficulty in early correct diagnosis and initiation of correct treatment for the same. In our case report, patient had clinical picture of chronic pain and discharging sinus over dorsum of left foot and radiological picture consists of lytic lesion in base of 3rd metatarsal left foot with strong periosteal reaction all along the 3rd metatarsal shaft. The patient was started on anti-tubercular therapy (ATT) for clinical and radiological diagnosis of tuberculosis 3rd metatarsal left foot. There is waxing and waning of signs and symptoms in our case over the period of four weeks. Due to non resolution of the discharging sinus curettage and open biopsy planned for the patient. In curettage we found a thorn which was removed and sample sent for culture, sensitivity and histo-pathological examination (HPE). Report showed culture of pseudomonas supp. sensitive to ciprofloxacin. Patient started on tab. Ciprofloxacin and found to be clinically and radiologically improved over the period of 3 weeks. In conclusion all the cases with suspected diagnosis of tubercular osteomyelitis and associated lytic lesion in the bone should undergo open biopsy.

Keywords: Lytic, Metatarsal, Osteo-articular, Pseudomonas, Tuberculosis.

Posterior Malleolar Fracture Fixation in Semilateral Position: A Review Study of 15 Cases

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Objective: Ankle fracture is a common orthopedic injury 1. Ankle laxity varies depending on the plantarflexion-dorsiflexion position and the direction of the applied force so light rotational forces can cause complex ankle fracture 2. Careful evaluation of X-rays and clinical examination are mandatory for succeful outcome.

Materials and methods: We reviewed 15 cases of ankle fracture with posterior malleolar involvement. We operated all cases by posterolateral approach in semilateral position.

Results: Semilateral position and posterolateral approach allows a great exposure of all malleoli. This makes interpretation of fracture and fixation easy.

Conclusion: We strongly recommend semilateral position and posterolateral approach for all fibula fracture with post malleoli involvement.

Keywords: Dorsiflexion, Pasterolateral, Plantarflexion, Posterior malleoli, Semilateral.

First Tarsometatarsal Fusion Using Saw Preparation vs Standard Preparation of the Joint: A Cadaver Study

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Introduction: First tarsometatarsal (TMT) joint fusion is indicated for several underlying causes of first ray dysfunction and pain, including arthritis, traumatic injury, and recurrent hallux valgus. Preparation of the joint surface by denuding the articular cartilage is a key step for arthrodesis, as inadequate preparation may result in poor fixation and non-union. However, excessive removal of cartilage and bone may result in excessive shortening of the ray. Despite the importance of joint preparation on the outcomes of fusion, the effects of using a bone saw vs osteotome on ray length is poorly documented in the literature. The purpose of this study was to investigate whether utilization of an osteotome or saw would minimize shortening of the first ray in TMT arthrodesis.

Materials and methods: Ten fresh-frozen cadaver specimens without evidence of musculoskeletal abnormalities were used for this anatomic dissection study. A medial incision was made along the first ray from the medial aspect of the medial cuneiform to the base of the first metatarsal. The first TMT joint was exposed through transverse capsulotomy. The soft tissues surrounding the joint were not removed from the bone. The specimens were randomly assigned to undergo cartilage removal and joint preparation using either an osteotome ($n = 5$) or saw ($n = 5$). Care was taken to reach the plantar-most aspect of the joint. Fusion was then performed using a cross-screw construct through the dorsal aspect of the proximal phalanx and the medial cuneiform. Pre- and postoperative X-rays were taken with a radiopaque ruler in the field, and length changes were compared between osteotome and sawblade groups.

Results: The average change in metatarsal length was significantly smaller in the osteotome group (1.6 mm) as compared to the saw group

(4.4 mm) ($p = 0.031$). The average percent change in metatarsal length was also significantly smaller in the osteotome group (3.0%) compared to the saw group (8.4%) ($p = 0.025$). There was no significant difference between the two groups with respect to change in cuneiform length. The osteotome group demonstrated a significantly smaller average measured change (3.0 mm vs 6.9 mm, $p = 0.001$) and percent change (4.1% vs 9.3%, $p < 0.001$) in total length (cuneiform plus metatarsal) in comparison to the saw group.

Conclusion: The results of this study demonstrate that first TMT joint preparation with an osteotome may prevent over-shortening of the first ray, thereby theoretically decreasing the risk of metatarsalgia and the need for additional procedures when compared to utilization of a bone saw. Judicious use of the bone saw for joint preparation may still be beneficial in some cases. This information can be used clinically to implement evidence-based standardization of operative techniques to improve the outcomes of these cases.

Accuracy of Talonavicular Injection Using Ultrasound vs Anatomical Landmark: A Cadaver Study

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Introduction: Intra articular injections play diagnostic as well as therapeutic roles in foot and ankle pathologies owing to the complex anatomy, small size, diverse bones and joints with close proximity in this region. Conventionally, these injections have been carried out using the anatomical landmark technique and/or under fluoroscopic guidance. The small joint space and needle size make the injection challenging. Fluoroscopy is not readily available in the clinical setting, and ultrasound guidance for injections is therefore increasingly being used in these settings. The purpose of this cadaveric study was to compare the accuracy of intra-articular talonavicular injections using the anatomical landmark technique vs ultrasound guided method.

Materials and methods: The study was carried out in 10 foot and ankle cadaveric specimens that were harvested transversely at mid-calf level. The foot was held in neutral position by an assistant while a fellowship-trained foot and ankle orthopaedic surgeon injected 2 cc of radiopaque dye using the anatomical landmarks and palpation method in five specimens. Same amount of radiopaque dye was injected in the remaining five specimens under ultrasound guidance. The needles were left *in situ* in all specimens and intraarticular placement was confirmed fluoroscopically.

Results: In all the five specimens injected under ultrasound guidance, the needle was found to be in the joint under fluoroscopic examination. All five needles injected by palpation method were found to be out of the joint, with one injected into the naviculo-cuneiform joint. Ultrasound-guided intra-articular injections were found to be significantly superior in terms of accuracy to the ones injected by palpatory method alone.

Conclusion: Intra-articular injections of the foot and ankle have considerable diagnostic as well as therapeutic values. Although injections using anatomical landmarks and palpation are easily performed at the office set-up, correct placement of the needle cannot be confirmed. Ultrasound guided injections can not only confirm correct needle placement but can also delineate any tendon and/or joint pathology simultaneously.

Ultrasound is convenient to use in the office set-up and demonstrably enhances the accuracy and reliability of talonavicular injections.

Entry Point Safe Zone for Anteroposterior Screws in Posterior Malleolus Fracture Fixation: A Cadaver Study

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Background: Percutaneous anterior-posterior (AP) screw is an option for posterior malleolus fracture fixation when the fracture fragment can be reduced indirectly by the mean of ligamentotaxis. However, anterior anatomic structures could be injured during screw placement. We assessed this risk in cadavers.

Materials and methods: Eleven below-knee cadavers were employed for the placement of AP screws in an attempt of fixing assumed Haraguchi Type-I posterior malleolar fractures. Three entry point, medial, middle, and lateral, were selected as medial to the tendon of tibialis anterior (TAT), lateral to the TAT, and lateral to the extensor digitorum longus (EDL). On each cadaver, three AP screws were placed under the guidance of fluoroscopy. After dissection, measurements were made (mm) from each screw to nearby structures. Mean, minimum, maximum distances, and 95% confidence intervals were calculated. Instances of damage to the structures were recorded.

Results: Mean, minimum, and maximum distances from the medial screw to the saphenous vein, TA, EHL, anterior tibial artery (ATA), and deep peroneal nerve (DPN), were 18.1 (12–25) mm, 2.0 (0–5) mm, 13.6 (9–20) mm, 16.6 (9–25) mm, and 20.1 (12–27) mm. From the middle screw to the ATA, DPN, TA, EHL, and EDL, were 1.2 (0–3) mm, 4.9 (3–9) mm, 3.8 (1–7) mm, 0.4 (0–2) mm, and 13.6 (10–18) mm. From the lateral screw to the superficial peroneal nerve (SPN), EDL, DPN, and ATA, were 10.8 (0–16) mm, 1.2 (0–4) mm, 15.9 (11–25) mm, 19 (15–27) mm. The SPN was found partially cut by the lateral screw on 1 specimen. The middle screws were adjacent to the ATA and DPN without damaging to them.

Conclusion: Lateral and middle percutaneous AP screw placement put certain anatomic structures at-risk of injury. Medial screw placement did not result in appreciable damage to adjacent structures. Entry point of AP screws should be selected with respect to posterior malleolar fracture and anatomic structures. Meticulous dissection should be performed when placing anteroposterior screws.

Keywords: Anterior–posterior screw, Cadaver, Latrogenic injury, Posterior malleolus fracture.

Evaluation of Appropriate Screw length and Diameter to Prevent Mal-reduction in Zone 2/3 5th Metatarsal Fractures: A Retrospective Analysis

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Introduction: Percutaneous fixation of 5th metatarsal fracture is associated with good outcomes. However, it may lead to malreduction due to improper implant selection and placement. Our aim was to test the effects of screw entry, length and diameter on reduction parameters

both previously defined as well as those introduced by the authors and to evaluate if this malreduction transpired to delayed union, non-union or refracture.

Materials and methods: We retrospectively reviewed acute, delayed and nonunion cases of isolated skeletally mature zone II and III 5th metatarsal fractures managed with intramedullary screw fixation with a single screw. Comparisons were made between plantar cortex distraction/lateral cortex distraction and ratios of screw length, diameter and entry point using multiple regression analysis. A further analysis was carried out between time to union and distraction in lateral/plantar cortices.

Results: Fourty eight patients were included with majority being females (30/48) with mean age being 43.5 years. Multiple regression analysis revealed that plantar and lateral gap was determined by entry point ratio on lateral and AP view respectively ($p < 0.001$ for both AP and Lateral). However there was no statistically significant association of either screw diameter/canal ratio ($p = 0.36$ for AP and $p = 0.89$ for lateral) or screw/apex length ratio ($p = 0.36$ for AP and $p = 0.67$ for lateral) to plantar/lateral gap. Ratio of postoperative/preoperative apex height on AP and lateral showed correlation to presence of lateral and plantar fracture gap respectively on postoperative X-rays ($p < 0.001$).

Discussion/conclusion: Contrary to radiologic studies emphasizing on screw length and diameter changing reduction we found screw entry as the only significant determinant for reduction in operatively managed Jones fractures.

Miniopen vs Lateral Approach for Ankle Arthrodesis, Which Approach is Better for Joint Preparation: A Cadaver Study

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Introduction: Ankle arthrodesis has been considered as a gold standard procedure for end stage ankle arthritis in patients who fail conservative management. Ankle arthrodesis may be done through direct anterior, lateral, arthroscopic or mini open approaches. Whatever the approach, important aspects of fusion are joint preparation, apposition of the joint surfaces and stable fixation. Ankle arthrodesis may be associated with complications like infection, chronic pain and nonunion. Out of these, nonunion is the most common complication reported in the literature. So achieving the union is of utmost importance while minimizing the complications associated with the procedure. Whatever the approach or fixation method, one of the most important things for successful union is preparation of the articular surface. However, the preparation of joint surface may be limited by the approach. Aim of our study is to evaluate the difference between direct lateral and dual mini open approaches (extended arthroscopic portals) in terms of joint preparation.

Materials and methods: We used 10 below knee fresh-frozen cadaver legs for this cadaveric study. Ankle joints of five specimens were prepared through the lateral approach, while the remaining five ankles were prepared using dual mini incisions. After the completion of preparation, all ankles were dissected to open, photographic images of tibial plafond and talar articular were taken. Surface areas of each articular facet and unprepared cartilage of the talus, distal tibia, and distal fibula were measured and analyzed using ImageJ software.

Results: A significantly greater amount of total surface area was prepared among specimens using the mini-open approach in comparison to those with the transfibular approach. The percentage of prepared surface area of total articulating surface (including talus and tibia/fibula), talus, tibia and fibula in trans fibular approach were 76.9%, 77.7% and 75% respectively. The percentages were 90.9%, 92.9%, and 88.6% in mini open approach. While the medial gutter was well prepared with mini incision technique (un prepared surface 44.64% vs 91.08%), lateral gutter was well prepared in trans fibular technique (88.82 vs 82.04 sq cm). There is no difference the amount of unprepared surface of talar dome between the two approaches. When. Excluding the medial gutter there was no significant difference between the transfibular and mini open techniques (83.94 vs 90.85, $p = 0.1412$).

Conclusion: Joint preparation using the mini-open approach (extended arthroscopic portal) is equally as efficacious as the transfibular approach for preparation of the tibiotalar joint. When including preparation of the medial gutter, the mini-open approach provides superior joint preparation. This may be advantageous with decreased rate of nonunion and less complications. But many surgeons fuse only tibiotalar surface, considering that, both approaches yield equal amount of joint preparation. But it needs to be confirmed with clinical studies.

Repair of Chronic Tendo-Achilles Rupture

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Introduction: Chronic rupture of Achilles tendon causes marked functional impairment. The recommended treatment for this is surgery and various techniques have been reported in the literature.

Materials and methods: From 2008 to 2016, 30 patients (20 men and 10 women) operated with Bosworth technique (23 patients) or peroneus brevis (PB) tendon transfer (7 patients) were included for the study. At 12-month follow-up, all patients were assessed with regard to postoperative complications, the American Orthopaedic Foot and Ankle Society (AOFAS) Ankle–Hindfoot score, and ankle range of motion.

Results: American Orthopaedic Foot and Ankle Society scores increased from an average 61.57/100 (range, 58–80) preoperatively to 95.91 (range, 90–98) postoperatively for Bosworth technique. AOFAS scores increased from an average 61.14/100 (range, 58–64) preoperatively to 96.71 (range, 94–98) postoperatively for PB tendon transfer technique. All patients were able to perform their daily activity unrestrictedly at last follow-up. Two patient experienced wound dehiscence and one patient had hypertrophic scar in Bosworth technique while one patient experienced wound dehiscence in PB Tendon transfer technique.

Conclusion: Both the techniques have near similar functional outcome and complication rate. However, Bosworth technique has limitations in the form of requirement of the distal stump and imparting of bulky consistency to the tendo-Achilles which are not present with PB tendon transfer technique. Either of the technique can be used as per the surgeon's preference and expertise as well as patients profile and choice.

Osteoarticular Tuberculosis of Foot and Ankle: A Case Series

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Tuberculosis of the foot and ankle is an uncommon presentation of skeletal tuberculosis. Five cases of osteoarticular tuberculosis of foot and ankle were studied and followed-up. All patients presented with pain and swelling of foot and ankle, and few with discharging sinus. X-rays and MRI was done as preoperative evaluation along with blood investigations. X-rays showed lytic lesions in tarsal and mid tarsal bones and destruction of mid foot joints and ankle joints. Biopsy was done in all cases to confirm the diagnosis. All had granulomas in the report

only one had acid fast bacilli positive in biopsy. All patients were started on medical line of treatment for 1 year. The symptoms of all patients improved during the course of treatment. Only one patient developed deformity of hind foot along with ankle joint destruction for which ankle arthrodesis was performed. Patient after few months developed discharging sinus and mid tarsal instability with destruction, which was uncontrolled with medical line of treatment. Patient underwent below knee amputation for same.

Outcome of Conservative Treatment in Achilles Tendinitis in Nonathletes

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Purpose of the study: To study the evaluation and outcome of conservative treatment in achilis tendinitis in non athletes.
A brief description of the methods: We prospectively studied 33 cases of achilis tendinitis. 12 were males and 21 were females. Average age was 36.4 years, average pain duration was 6 weeks. X-rays showed calcaneal spur in 13 patients and calcification of lower tendo achilis in 5 patients. Patients were given heel rise for 3 to 4 weeks duration with analgesics and anti-inflammatory medication. Gradual stretching exercises were started in all which included single leg heel down. Patients were followed up at 3 weeks, 6 weeks and 3 months.
Results obtained: Visual analog scale was used to determine pain score. Numerical rating scale and wong becker face rating scale was average of 7.36 which reduced to 2.63 and 7.27 which reduced to 2.7 respectively.
Conclusions reached: Conservative management gives good results in achilis tendinitis in non athletes.

New Landmarks for Ideal Syndesmotic Screw Positioning: A CT-based Analysis and Radiographic Simulation

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Purpose: Lack of rigid bony landmarks for orienting syndesmotic-screw results in high risk of malpositioning. In this CT based study, we investigated relationship of syndesmosis with various rigid bony landmarks around ankle joint, independent of foot and horizontal plane and performed a radiographic simulation for their practical applicability.
Materials and methods: We collected consecutive CT studies of uninjured normal ankle joints between 2018–2019. We defined following surface landmarks—posterolateral and posteromedial surface of distal tibia, bimalleolar tips and anterior and posterior extents of both malleoli. Axial differences between coronal plane through the central axis of syndesmosis and specific coronal planes through these bony landmarks were measured. Software-based lateral radiographs were created with the reference coronal plane for each kept horizontal assuming a supine positioned limb.
Results: Among the different modified coronal planes, the axial differences of syndesmotic axis with anterior malleolar, bimalleolar tips and posteromedial surface based coronal planes were the least varying in that order. Except for the posterior lip of tibial incisura, all other bony landmarks were radiologically identifiable in majority (91.66%) of the cases.
Conclusion: Our study attempts to provide solution for issues related to syndesmotic screw malpositioning, by using new bony landmarks that can be used clinically and fluoroscopically for syndesmotic-screw positioning. Bimalleolar tips, anterior malleolar extents and posteromedial surface can be reliably used clinically as well as fluroscopically for directing syndesmotic-screw.

Talar Dislocation without Medial Malleolus Fracture: A Rare Presentation

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Talus dislocation without medial malleolus fracture is rarely described. We have encountered two such cases.

Dumbell-shaped Tubercular Tenosynovitis of Ankle: An Uncommon Presentation of a Common Etiology

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Tuberculosis is endemic in our country with pulmonary manifestations being the commonest. Amongst the extrapulmonary manifestations, musculoskeletal involvement occurs in less than 5% cases. We report a case of tubercular tenosynovitis of the ankle joint in a young Indian female. Involvement of the ankle joint is a rarer entity which is often missed due to non specific and indolent presentation. The patient had an insidiously developing, non tender ankle swelling for which ultrasound and MRI was advised. On ultrasound, tenosynovial effusion with rice bodies was seen which was confirmed on MRI. The extensor digitorum tendons were passing through the lesion, but were unaffected. The swelling was dumbell shaped as the collection passed below the extensor retinaculum. Surgical excision with biopsy of the lesion was done which revealed tubercular necrotising granulomatous infection. The patient was advised anti TB treatment and is asymptomatic. With this case report, we re-inforce that TB remains an uncommon yet an important consideration in slowly developing tenosynovitis.

Reconstruction of Neglected Tendo-Achilles Tear with Peroneus Brevis: A Prospective Study

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Introduction: Reconstruction of degenerated ruptures of the tendo-Achilles is a challenge. Ruptured tendons and the remaining tendon ends are abnormal. A number of methods have been described in literature to reconstruct the tendo-Achilles, but with variable results.
Materials and methods: This prospective study was conducted between July 2015 to December 2018 at BPS Government Medical College.

Thirty patients with more than 3 weeks old ruptured tendo-Achilles, were managed by excision of fibrous tissue from the affected site and transferring the peroneus brevis tendon to calcaneum. They were between 38 years and 50 years of age. There was history of steroid injection for retrocalcaneal bursitis and Achilles tendinitis in 16 cases, in 6 cases it was spontaneous rupture and in the rest direct trauma was the cause.

Results: Good results were achieved in 27 cases and fair in 3. There was only one skin necrosis with mild infection which healed by secondary intention without any serious after effect.

Conclusion: This procedure requires a smaller incision and provides a vascular dynamic transfer and reinforcing tendon graft. The strength and function of ankle and push off are achieved earlier and are better.

Management of Retrocalcaneal Bursitis with Calcaneal Osteotomy: A Prospective Study

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Introduction: Retrocalcaneal bursitis or hagelunds deformity is common cause of posterior heel pain. Surgical treatment like excision of postero superior portion of calcaneum was considered when conservative treatment fails.

Materials and methods: This was prospective study on 30 patients at BPS Govt Medical College between January 2016 to December 2018. In 17 patients, resection of bursal projection and calcaneal osteotomy was done through medial approach and in 13 patients through lateral approach as prominent posetro superior part was more on lateral side.

Results: 24 patients (82%) had good results, 4 (10%) had fair and 2 (6.7%) had poor results. Two patients had superficial infection and 1 had paraesthesia

Conclusion: Calcaneal osteotomy gives good results in retrocalcaneal bursitis patients with failed conservative management.

Safety and Efficacy of Achilles Repair Using the Mini-open Approach in Supine Position vs Prone Position: A Retrospective Study

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Intro/purpose: Surgical repair of the Achilles tendon is a commonly-performed procedure in cases of acute tendon rupture. Open Achilles tendon surgery with traditional extensile approach is most often performed with the patient in prone position, but this can interfere with airway access, put increased pressure on the abdomen, and subject to increase perioperative period and comorbidities. Mini-open approach in supine repair may potentially avoid the risks of the prone position, but the outcomes and of this approach have not been established. The purpose of this study is to compare perioperative outcomes and differences in cost between patients undergoing acute Achilles rupture repair with mini-open approach in the supine position vs traditional approach in the prone position.

Materials and methods: Patients who underwent surgical repair of acute Achilles rupture between the years 2011 and 2018 at a single institution were retrospectively identified using CPT code 27650. Patients who underwent concurrent procedures for additional injuries were excluded. Charts of included patients were retrospectively reviewed for demographic information, intraoperative characteristics, and postoperative outcomes. Statistical analysis was conducted and p values ≤0.05 were considered significant.

Results: A total of 80 patients were included for analysis, 26 supine and 54 prone. Baseline characteristics were statistically similar between the two groups. Average total time in the operating room was significantly greater among patients in the prone position (118.7 minutes) than those in the supine position (100 minutes) ($p = 0.001$). Average surgery time, blood loss, total cost, and time in PACU were greater among the prone group than the supine group, although these differences were not statistically significant. While not statistically significant, total cost for the supine group ($19,889) was less than the for the prone group ($21,722) ($p = 0.153$) Average postoperative pain score, infection rate, dehiscence rate, sepsis rate, and DVT rate were also similar between the two groups.

Conclusion: The mini open approach in supine position may be advantageous in repair of acute Achilles rupture in that it significantly reduces total time in the operating room and total cost while maintaining positive patient outcomes. Prospective clinical studies are warranted to validate these assessments.

Summary: The mini open approach in supine position may be advantageous in repair of acute Achilles rupture in that it significantly reduces total operating room time while preserving positive patient outcomes and potentially reducing costs.

Keywords: Achilles Repair, Achilles Rupture, Mini-open approach, Prone, Supine.

Does Postoperative Gabapentin Administration Reduce Opioid Consumption after Foot and Ankle Surgery?

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Introduction/purpose: Prescription opioids are commonly used to control postoperative pain in foot and ankle surgery, but present potentially detrimental side effects including sedation, respiratory depression, and addiction. In foot and ankle surgery, pain is a common cause of delayed hospital discharge and decreased willingness to move, thereby slowing recovery. Gabapentin acts by decreasing lesion-induced hyperexcitability of posterior horn neurons and central sensitization, and has been explored as a potential addition to patients' pain regimen. Although studies have previously assessed the effect of gabapentin on pain relief, to our knowledge none have evaluated whether gabapentin is effective in opioid consumption reduction beyond the immediate postoperative period. The purpose of this study is to assess whether gabapentin acts synergistically to improve postoperative pain among patients undergoing foot and ankle surgery.

Materials and methods: Patients from a single institution who underwent elective foot and ankle surgery were identified using CPT codes 27700, 27702, 27870, 28705, 28715, 28725, 28730, and 28740. All patients prescribed opioids postoperatively were included. A retrospective chart review was conducted for each patient to identify

prescription dose, number of pills, date in which prescription was filled, and dates of refills for oxycodone, hydrocodone, oxycodone–acetaminophen, hydrocodone–acetaminophen, tramadol, and gabapentin. Medication information was collected only for prescriptions by the operating surgeon, nurse practitioner, physician assistant, resident, or fellow which were pertinent to the foot/ankle surgery performed; prescriptions from other services or providers were not included in order to ensure that the medications prescribed were specific to postoperative pain. Opioid quantities were converted to morphine equivalents and compared at various time intervals between patients who were prescribed only opioids, and patients who were prescribed opioids and gabapentin.

Results: Among patients not taking opioids or gabapentin preoperatively, total morphine equivalents prescribed was significantly less among patients prescribed postoperative gabapentin (177.3 OME) in comparison to those prescribed only opioids (442.2 OME) ($p = 0.0018$) in the 3–6 week postoperative interval. When all patients were analyzed, including those taking preoperative opioids or gabapentin, patients who received postoperative gabapentin were also prescribed significantly fewer OME at weeks 1–2 ($p = 0.0270$), weeks 3–6 ($p = 0.0006$), and weeks 7–12 ($p = 0.0149$).

Conclusion: Gabapentin may be effective in reducing postoperative opioid consumption beyond the immediate postoperative period among elective foot and ankle surgery patients. Prospective clinical trials are warranted to further validate these results.

Comparison of Risk Factors for Postoperative Complications across Age Groups in Patients Undergoing ORIF of the Ankle

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Introduction: Risk factors associated with various adverse outcomes for patients undergoing open reduction and internal fixation (ORIF) of the ankle, and how these risks differ between younger and older patient populations, has not been clearly established. Objective quantitative data may aid physicians in surgical decision making, individualizing postoperative management, and targeting interventions for reducing postoperative comorbidity. The purpose of this study is to compare the incidence of and risk factors for adverse postoperative outcomes following ORIF of ankle fractures across patient age groups.

Materials and methods: Charts of patients age 18 years and older who underwent open reduction and internal fixation (ORIF) for any closed, non-polytraumatic, non-pilon ankle fracture at a single institution between the years 2008 and 2018 were reviewed. Demographic information, comorbidities, and postoperative outcomes were collected. Relative risks for adverse outcomes were calculated and compared between patients younger than 50 and patients 50 years and older.

Results: A total of 886 patients were included, 375 (42.3%) of which were over age 50. The incidence of complications between younger and older age groups can be seen in Table 1. In both age groups, risk of infection was significantly increased among patients with hypertension, although risk among older patients (RR = 3.52, $p = 0.004$) was greater than that among younger patients (RR = 2.46, $p = 0.017$). In patients younger than 50, significant risk of wound dehiscence was associated with tobacco use (RR = 3.39, $p = 0.022$), substance use (RR = 3.07, $p = 0.020$), and CHF (RR = 12.77, $p < 0.001$). Risk of implant failure was significantly increased among younger patients with HIV (RR = 4.33, $p = 0.026$), CHF (RR = 10.54, $p < 0.001$), and CKD (RR = 10.54, $p < 0.001$), and among older patients with HTN (RR = 4.51, $p = 0.006$), CHF (RR = 5.83, $p < 0.001$), and tobacco use (RR = 3.82, $p = 0.001$).

Discussion and Conclusion: Patients undergoing ORIF of the ankle should be well-informed of the potential risks of surgery as they pertain to specific comorbidities. The results of this study provide valuable information regarding possible risks for adverse outcomes in younger and older patient age groups undergoing ORIF of the ankle. Multidisciplinary approaches are warranted for appropriate management of patients with multiple comorbidities.

Postoperative Aspirin Use and its Effect on Bone Healing in the Treatment of Ankle Fractures

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Introduction and purpose: There is hesitancy to administer nonsteroidal anti-inflammatories (NSAIDs) within the postoperative period following fracture care due to concern for delayed union or nonunion. However, aspirin (ASA) is routinely used for chemoprophylaxis of deep vein thrombosis (DVT) and is gaining popularity for use after treatment of ankle fractures. The current study examines the incidence of nonunion of operative ankle fractures and risk of DVT in patients who did and did not receive postoperative ASA. We hypothesize that time to clinical and radiographic union and the risk of DVT are no different.

Materials and methods: A retrospective chart review was performed on all patients treated between 2008 and 2018 for ankle fractures requiring operative fixation by three foot and ankle fellowship trained orthopaedic surgeons at a single institution with a minimum of three months follow up. Demographics, preoperative comorbidities, and postoperative medical and surgical complications were compared between patients who did and did not receive ASA postoperatively. For both groups, union was evaluated by clinical examination as well as by radiographs.

Results: In total, 506 patients met the inclusion criteria for this study and were included in the final analysis (152 who received ASA and 354 who did not). The demographic characteristics of ASA and non-ASA patients are, respectively, mean age of 43.8 and 212 41.7 years (p value 0.1693), 43.4% (66/152) and 46.2% (163/353) male (p value 0.5684), 51.3% (78/152) and 51.1% (180/352) Caucasian (p value 0.5182), mean BMI of 31.2 and 30.5 (p value 0.2845), with a majority in both groups being American Society of Anesthesiologists Class 2, 48.7% (74/152) vs 53.7% (189/352) (p value 0.0983). There were no significant differences in medical comorbidities between the ASA and non-ASA patients, respectively except for immunosuppressant use (0.7% (1/137) vs 4.6% (15/324); p value 0.0366) and hypertension (41.6% (59/142) vs 29.1% (95/327); p value 0.0081).

Complication risks among ASA and non-ASA patients, respectively, were 3.6% (5/138) vs 6.5% (21/324) for superficial infection (p value 0.2224), 0.7% (1/137) vs 3.4% (11/323) for deep infection (p value 0.0997), 4.4% (6/138) vs 4.0% (13/323) for wound dehiscence (p value 0.8730), 0.7% (1/137) vs 0.0% (0/323) for sepsis (p value 0.1243), and 9.4% (13/138) vs 8.3% (27/324) for hardware failure (p value 0.7038). Mean pain scores at 2, 6, 12, and 24 weeks were not significantly different between groups. Radiographic healing was assessed at 6, 12, and 24 weeks. The percent showing expected radiographic healing among ASA and non-ASA patients were, respectively, 95.9% (94/98) vs 98.6% at 6 weeks (207/210) (p value 0.2134), 96.0% (72/75) vs 94.9% (149/157) at 12 weeks (p value 0.8998), and 95.9% (94/98) vs 98.6% (207/210) at 24 weeks (p value 0.2134). Nonunion risks at 24 weeks between the ASA and non-ASA patients were, respectively, 3.1% (3/98) and 1.0% (2/210) (p value 0.2134). None of the nonunions occurred in patients on immunosuppressive

therapy. With respect to the incidence of DVT within the postoperative period, there was no statistical difference found between groups, with a 0.7% (1/137) risk of DVT in those who received prophylactic ASA vs 1.2% (4/323) in those that did not (*p* value 0.6305). A subgroup analysis based on risk factors (tobacco use, alcohol use, illicit drug use, diabetes, HIV, immunosuppressant use, peripheral neuropathy, chronic kidney disease, RA) was also performed. Outcomes were delineated based on ASA use and whether a patient had one of the listed risk factors. ASA use was not associated with a statistically significant difference in complication risk, healing risks, or pain scores. Of note, patients with at least one risk factor who received ASA had shorter follow-up than those with at least one risk factor who did not receive aspirin.

Conclusion: The role of inflammation in fracture healing is key, thus in theory the inhibition of the COX-2 pathway by NSAIDs, such as the ASA prescribed in the postoperative period for DVT prophylaxis, may play a role in nonunion. However, this clinical question has not been posed in the setting of ankle fractures and rates of nonunion. This study shows postoperative use of ASA may not delay radiographic union of operative ankle fractures or affect the rate of postoperative DVT. This is the first and largest study to examine the effect of ASA on time to union of ankle fractures.

Joint Preparation and Ray Shortening in Arthroscopic vs Open First MTP Fusion: A Cadaver Study

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Background: First metatarsophalangeal (MTP) joint fusion has been shown to improve stability, propulsive power, and overall function of the foot with excellent patient satisfaction. Regardless of surgical approach, adequate joint preparation is critical to successful outcomes of MTP fusion. Little evidence exists regarding the safety and efficacy of arthroscopic technique for MTP fusion. Additionally, there is no consensus on the amount of first ray shortening that is acceptable following MTP fusion. The purpose of this study was to compare the amount of joint preparation and first ray shortening following first MTP joint fusion utilizing open conical reaming vs arthroscopic technique.

Materials and methods: Ten below-knee cadaver specimens were randomly assigned to undergo either open or arthroscopic first MTP fusion. Following fixation, first ray length measurements were obtained from preoperative and postoperative radiographs and were used to determine first ray shortening. Additionally, the ratio of first ray length to second ray length was calculated both preoperatively and postoperatively and compared between the two approaches. All ankles were then completely dissected and prepared surface areas were demarcated. ImageJ photo analysis software was used to calculate the percentage of prepared and unprepared cartilage of each articular surface of each specimen.

Results: Overall, the open approach resulted in 94.1% joint surface preparation while the arthroscopic approach yielded 70.6% ($p = 0.051$) (Table 1). On average, the head of the first metatarsal was significantly more prepared with use of the open approach (92.5%) than with the arthroscopic approach (70.6%) ($p = 0.0350$). However, with respect to the base of the phalanx, the average difference in preparation between the arthroscopic approach and the open approach was not statistically significant (90.0% vs 99.0%, $p = 0.159$). The average amount of first ray shortening in the arthroscopic approach was 2.2 mm compared to 2.1 mm in the open approach (0.934). The average change in first to second ray length ratio was 0.02 for both approaches (0.891).

Conclusion: Arthroscopic first MTP fusion can be used to achieve joint preparation comparable to open technique while maintaining first ray length. Arthroscopic first MTP fusion may be a safe alternative surgical option for patients at high risk for complications of an open procedure. However, MTP arthroscopy is technically demanding and requires adequate training and surgical experience.

Keywords: Arthroscopy, First ray shorteningy, Metatarsalgiag, Metatarsophalangeal fusiona.

Anatomical Landmark Technique vs Ultrasound-guided Approach for Posterior Tibial Nerve Block in Cadaver Models

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Introduction: Until recently, many regional anesthetic blocks were performed without the assistance of ultrasound, relying on methods such as anatomical landmarks and nerve stimulation. The use of ultrasound for peripheral nerve blocks has proven extremely useful for improving the efficacy of many regional anesthetic techniques. There remain a few nerve blocks which have lagged behind in employing the assistance of ultrasound consistently, one of which is the ankle block. This block is commonly utilized for either surgical anesthesia or postoperative analgesia for a variety of foot and ankle procedures. In this study, we compared the accuracy of traditional landmark technique with an ultrasound guided approach for ankle block by assessing the spread of injectate (dye) along the posterior tibial nerve (PTN) in cadaver models.

Materials and methods: Ten below-knee cadaver specimens were used for this study. Five were randomly chosen to undergo landmark guided PTN blocks, and five were selected for ultrasound-guided PTN blocks. The landmark technique was performed by identifying the medial malleolus and Achilles tendon and inserting the needle (4 cm long, 21G Braun® Stimuplex) at the midpoint of the two structures, aiming toward the medial malleolus and advancing until bone was contacted. 2 cc of blue acrylic dye was injected at this location. The ultrasound technique was performed with a linear probe identifying the medial malleolus and the PTN. The needle was advanced in-plane with a posterior to anterior trajectory until the tip of the needle was adjacent to the nerve. 2 cc of blue acrylic dye was injected surrounding the nerve. The extremities were then dissected to determine which nerves had been coated with dye.

Results: 100% of the ultrasound guided blocks resulted in completely stained PTN with dye. In the landmark group, only 40% of the landmark technique blocks resulted in completely stained PTN with dye. Of the nerves not stained with dye, 2 were noted to have had dye injected posterior to the nerve and 1 was noted to have had dye injected into the flexor digitorum longus tendon.

Conclusion: The base of evidence has dramatically increased in recent years in support of the use of ultrasound in regional anesthesia. This study substantiates the superiority of ultrasound guidance for ankle block by demonstrating a 100% success rate amongst the ultrasound guided group.

Do Geographic Region, Pathologic Chronicity, and Hospital Affiliation Affect Access to Care among Medicaid- and Privately-insured Foot and Ankle Surgery Patients?

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Background: Studies have shown that patients enrolled in Medicaid have difficulty obtaining access to care compared to patients with private insurance. Whether variables such as geographic location, state expansion vs non-expansion, and private vs academic affiliation affect access to care among foot and ankle surgery patients enrolled in Medicaid has not been previously established. The purpose of this study is to assess the differences in access to care between patients who are privately insured and those with Medicaid in need of foot and ankle consultation.

Materials and methods: Twenty providers from each of five Medicaid-expanded and five non-expanded states in different U.S. geographic regions were randomly chosen via the American Orthopedic Foot and Ankle Society (AOFAS) directory. One investigator contacted each office requesting the earliest available appointment for their fictitious relative's acute Achilles tendon rupture or hallux valgus. Investigator insurance was stated to be Medicaid for half of phone calls, and blue-cross blue-shield (BCBS) for the other half. Appointment success rate and average time to appointment were compared between private insurance and Medicaid. Results were further compared across geographic regions, between private and academic practices, and between urgent acute injury (Achilles rupture) and chronic non-urgent injury (hallux valgus).

Results: Appointments were successful for all 100 (100%) calls made with BCBS, in comparison to 73 of 100 calls (73%) with Medicaid ($p < 0.001$). Both acute and chronic injury had significantly higher success rates with BCBS than Medicaid ($p < 0.001$). Medicaid patients had similar appointment success rates for a complaint of hallux valgus (72.0%) and Achilles rupture (74.0%). Appointment success rate was significantly lower with Medicaid than with BCBS ($p \leq 0.01$) in all geographic regions, with highest and lowest success occurring in the west (80.0%) and northeast (65.0%), respectively. The was no significant difference in success rate between Medicaid expanded (88.0%) and non-expanded (85.0%) states ($p = 0.53$). Success rate with Medicaid (66.7%) was significantly lower than with BCBS (100.0%, $p < 0.001$) for private practice offices, but there was no significant difference in success rate for academic practices. Additionally, there was no significant difference in appointment wait time between insurance types.

Conclusion: Patients with Medicaid experience difficulty in obtaining outpatient appointments for common non-emergent foot and ankle problems and may experience increased difficulty scheduling appointments at private rather than academic institutions. Additionally, patients with Medicaid have decreased success of receiving an appointment regardless of geographic region. The chronicity and time-sensitivity of the injury does not appear to impact the ability to gain an appointment. The medical community should continue to seek and identify potential interventions which can improve access to orthopaedic care for all patients, regardless of insurance status.

Schwannoma: A Rare Cause of Nondiskogenic Sciatic Pain

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Introduction: Schwannoma, also called neurinoma or neurilemmoma, is a benign peripheral nerve sheath tumor arising from Schwann's cells. Schwannomas are the most common peripheral nerve sheath tumors. Schwannomas of the sciatic nerve are very rare (1%) and may raise confusion in diagnosis with late discovery of the tumor. In the present observation, we report a case of sciatic nerve schwannoma revealed by chronic sciatica in a middle aged female and discuss the importance of early diagnosis and prompt treatment in form of complete excision of this benign tumor.

Observation: A 45-year-old female patient, with no previous medical history, presented with pain of 1-year duration that radiated from the posterior aspect of the right thigh to the lateral aspect of the leg and right foot and associated with numbness of right lower limb, without trauma. This patient had already undergone lumbar magnetic resonance imaging (MRI), which had not revealed any particular anomaly. On neurologic examination, no obvious motor deficit but hypoesthesia in S1 dermatome was noted. Osteotendinous reflexes and range of motion were normal. Biological analysis failed to exhibit any anomaly. Further questioning combined with palpation of the posterior aspect of the right thigh elicited an isolated oblong soft-tissue mass sensitive to percussion, which had been gradually increasing in size for more than 1 year but never mentioned by the patient. Standard radiographs were normal and did not reveal any bone anomaly. Magnetic resonance imaging of the right thigh showed an ovoid expansive mass of 50 mm height along the right sciatic nerve, of iso signal intensity to muscle on T1-weighted images the mass was enhanced heterogeneously after injection of gadolinium. Schwannoma of the right sciatic nerve was thus diagnosed. Complete excision of the tumor was then performed. Examination revealed the excised mass to be well-encapsulated, of whitish appearance, adherent to the sciatic nerve, eccentrically located on the nerve and easily removable. It repulsed fascicular groups without penetrating them and a cleavage plane was found along the interface between the tumor capsule and nerve fibers thus allowing a complete macroscopic excision with no interruption in the continuity of the sciatic nerve. Macroscopic aspect of the mass after complete surgical excision.

Discussion: Peripheral nerve tumors are rare conditions. They arise from the sheath of the nerve, which in turn originates from the neurectoderm and neural crest. Schwannomas are the most common peripheral nerve sheath tumors they generally affect the main trunk of the nerve, more specifically in the upper limb. The posterior tibial nerve at the tarsal sinus is the most frequently involved nerve of the lower limb. Involvement of the sciatic nerve is rare and represents less than one over 100 cases. The nerve might be affected by the tumor all along its course.

Schwannomas most commonly occur in adults between 20 years and 50 years of age, without distinction of gender, with an approximate one sex ratio. They generally appear as solitary lesions. Occurrence of multiple schwannomas is rare and not necessarily correlated with neurofibromatosis, which demonstrates very precise chromosomal alterations. Malignant transformation of benign schwannomas is unusual. The most common clinical presentation of sciatic nerve schwannoma consists of a painful palpable mass. Other clinical symptoms include radicular and distal pains often distant from the lesion site, paraesthesia, hypoesthesia and rarely motor deficiencies. Pain is often attributed to distal sciatica but there is no impulse at cough and a mass sensitive to percussion is detected at palpation of the nerve course. Aetiologic investigation late reveals a schwannoma of the sciatic nerve since it is often combined with a radicular pain similar to sciatic due to a herniated disk while imaging of the

spine might reveal a moderate discopathy wrongly considered as responsible for symptoms. In our observation, clinical symptom consisted of chronic sciatica and imaging of the spine was normal. Ultrasonography revealed a hypoechoic mass, eccentrically located on the affected nerve which fibrillar aspect was preserved. At cross-sectional imaging using color Doppler, it was found to be round and often hyperaemic. The main lesion to be considered in the differential diagnosis is neurofibroma, which unlike schwannoma, appears as a solid and well-centered mass on the affected nerve which fibrillar aspect completely disappears. Three-dimensional high contrast resolution MRI offers better discrimination of soft-tissue than CT scan. It accurately depicts the tumor and its extent. The schwannoma is excentrically located on the nerve, and appears of isosignal intensity on T1-weighted images and of hypersignal intensity on T2-weighted images. This is a well-circumscribed mass which peripheral rim is of hyposignal intensity thus suggesting the presence of a capsule. Gadolinium signal enhancement is usually homogeneous except in cystic or necrotic lesions or in case of giant tumors. In most cases, MRI allows differentiation between schwannomas and neurofibromas. Actually, the rounded aspect, peripheral hyperintensity and more or less homogenous hypointense center on T2-weighted images are characteristic features of schwannoma whereas neurofibroma is usually heterogeneous or rarely homogeneous on both T1- and T2-weighted images. Such distinction between neurofibroma and schwannoma is important since neurofibroma deeply affects the nerve thus requiring complete resection with functional consequences whereas schwannoma might be resected without loss of nerve continuity. A variety of expansive lesions might also originate from the sciatic nerve and lead to mistaken diagnoses such as fibrolipomatus hamartoma, a rare benign tumor, which might progressively reach a significant size in the pelvis with no other clinical symptom than compression of the neighbouring organs. Other rare nerve tumors might develop from the constitutive elements of the nerve such as intra-nervous lipoma, hemangioma of Schwann's sheath and neuro-fibro-lipoma. Mucoid cysts are rare and benign tumors which can arise from all peripheral nerves near joints and which should be suspected when facing rapid occurrence of neural lesion near joints. Pre- and postoperative search for communication with the neighboring joint should be performed especially to reduce the risk of recurrence. Malignant neural tumors have different clinical manifestations and a bad prognosis. They are initially painful and rapidly growing tumors often associated with neurologic deficit. Magnetic resonance imaging is the most efficient tool for diagnosis of these tumors. However, only histological investigation will provide accurate diagnosis. Surgical excision is the treatment of choice. Schwannomas are theoretically removable since they repulse fascicular groups without penetrating them thus allowing their enucleation while preserving nerve continuity as reported in our patient. Microsurgical excision should be performed using electrical stimulation to facilitate detection of motor fascicles. The sciatic nerve fascicles might sometimes be incorporated peripherally on the tumor capsule thus requiring to be sacrificed. Finally, one should consider the medico-legal consequences of an incomplete tumor excision or resection of a major nerve for a benign tumor since the neural graft subsequently associated with muscular transfer only provide partial recovery of deficits.

This tumor has a good prognosis and a low incidence of recurrence and malignant transformation unlike neurofibromatosis.

Conclusion: Schwannomas of the sciatic nerve are rare and well-delineated tumors, eccentrically located on the nerve. Although rare, schwannoma of the sciatic nerve should be systematically suspected if persistent sciatica is reported in young adults with no signs of radicular compression at imaging. Slice imaging, especially MRI, can help improve detection and perform differential diagnosis between schwannoma and neurofibroma. However, diagnosis should be histologically confirmed.

Conflicts of interests: None

To Recognize the Problem Areas of Newcomers in Ponseti Method

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To Recognise the problem areas of newcomers in Ponseti method. The author faced a lot of problems while managing clubfoot using the Ponseti method and decided to tabulate them as a questionnaire, was distributed to 10 willing participants (Orthopaedic Postgraduate Trainees at KMCH, Katihar, Bihar) having experience of less than 10 clubfeet management by Ponseti method and their responses were recorded. Questions regarding 1 number of casts to be needed 2 need for tenotomy 3 not starting the casting in the first week? 4 calming the baby 5 Locating the head of the talus 6 deformity seemingly increasing after the first cast? 7 cast too bulky or of adequate strength 8 pressure during casting like ulcers 9 premature tenotomy or inadequate tenotomy 10 deformity seemingly overcorrected on the post tenotomy cast 11 compliance of the FAO. All newcomers found Q1, 2, 11 problematic. 9 newcomers found Q3, 6, 7, 10 problematic. Q4, 5, 8, 9 were problematic for 7 out of the 10 newcodmers. Interestingly, the problem areas were less of the technical points (7/10) we teach the newcomers or we are taught by seniors and more of practical points (10/10 and 9/10). Recognising these problem areas may logically guide us to where we need to focus our further advise, guidance and training to get results as good as Ponseti himself by all, even by newcomers.

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Case Report of One-month-old Neglected Left Medial Peritalar Dislocation

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Introduction: Peritalar dislocation is a very rare entity in Traumatology, as they affect 1–1.5% of all leg injury cases. It represent about 1% of all types of traumatic dislocation. It involves simultaneous disruption of the talocalcaneal and talonavicular joints.

Mode of injury can be road traffic accident, fall from height and sports injuries leading to excessive inversion and eversion force and tearing of ligaments. If closed reduction is not possible, then open reduction. Irreducible injuries have been reported in 47% of cases. Open dislocations represent between 46% and 83% of all cases and have been associated with poor prognosis. We report a case where closed reduction of the Medial peritalar dislocation was attempted and failed. Subsequently, patient presented with neglected case with one month old dislocation. Closed reduction with external fixator tried but failed so open reduction was done with intraop-fixator.

Case description: 48-year-old presented to causality with history of dash given by four wheeler from back side while patient was on bicycle. He injured his right ankle and foot in the incident. He presented with hospital after 1 week.

On examination, there was swelling and tenderness and deformity of right foot. There was no distal neurovascular deficit. Antero-posterior, lateral and mortise view radiographs and a CT scan of the ankle with 3D reconstruction was taken. Diagnosis of medial peritalar dislocation. Closed reduction was attempted under spinal anesthesia by the resident doctors which failed. Then patient again presented after 1 month.

Postoperative Weight-bearing was started at 6 weeks and full weight bearing at 3 months. The patient was followed up and the radiograph below showed congruent reduction maintained at 18 months. Patient has good functional outcome.

Discussion: Subtalar dislocation is a very rare injury and reported as case reports or small series in literature. It is usually associated with fractures and isolated dislocations are uncommon. Subtalar dislocations represent about 1% of all types of traumatic dislocation. Emergency closed reduction is to be done to avoid complications of neurovascular and skin necrosis, closed reduction can be done by giving traction to the foot and heel in the line of the deformity with the knee in 90° flexion with counter traction. Literature shows that 10–20% of closed reduction have failed due to impingement and buttonholing of the soft tissues (mainly tibialis posterior followed by flexor digitorum and flexor hallucis longus tendons. In the open reduction of subtalar joint dislocation tibialis posterior along with flexor hallucis longus and flexor digitorum should be levered out.

Functional Reconstruction of Complex Posttraumatic Knee Foot and Ankle Deformity

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Purpose of study: Proper assessment and staged treatment protocol is important for satisfactory outcome in management of complex post traumatic and ischemic knee ankle and foot deformity.
Description of methods: We present a case of posttraumatic knee stiffness with tibia vara, equino cavo-varus foot with claw toe deformity in a patient with history of compound fracture proximal tibia with anterior compartment syndrome leading to volkmann ischaemic contracture presented 1 year after injury functional impairment and deformities were assessed by identifying.

- The leg compartments involved,
- Degrees of extrinsic and intrinsic muscle imbalance in ankle and foot
- Fixed deformities
- Degrees of motor sensory nerves injured
- Treatment is based on appreciation of the patho-anatomy of the deformities
- Treatment was planned according to established protocols in stepwise fashion to include release of fixed contractures, using infarct excision, myo-tendinous lengthening, tendon transfer, arthrodesis and osteotomy

Summary: Satisfactory outcome with ankle foot and knee functioning in near normal capacity working in tandem with the other normal leg allowing the patient to fulfill all activities of daily living.

Tale of Two Tali

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Talat body fracture are uncommon high energy injuries, which are difficult to manage and have variable outcomes. We are presenting two cases with fracture of talar body and talwar neck, one pt was managed by open reduction internal fixation using malleolar osteotomy and other patient was managed with fixation without malleolar osteotomy and non anatomical reduction. Final outcome obtained with anatomical reduction and osteotomy tend significantly improved outcome, and should be used when and where required. Anatomical reduction is key to good result and malleolar osteotomy present as a mean of obtaining good results in difficult situations.

A Surgical Approach to Giant Cell Tumor of Lower End of Tibia with Curettage and Reconstruction by Bone Grafting Harvested from Left Iliac Crest and K-wire Fixation: A Case Report

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Introduction: Giant cell tumor (GCT) is a distinctive lesion characterized by the proliferation of multinucleate giant cells in a stroma of mononuclear cells; it is generally seen in skeletally mature individuals. Giant cell tumor of bone is usually found in the long bones around the knee or in the distal radius but distal end of tibia, proxal humerus, vertebrae of young adults are unusual location. We report a case of GCT of the distal end of tibia, with a secondary aneurysmal bone cyst, in a 26-year-old female. Based on our review of the medical literature, it appears that the occurrence of a GCT along with a secondary aneurysmal bone cyst (ABC) in distal end of tibia is less typical with challenging task for full tumor resection and restoration of ankle function to normal.
Case description: 26 year old female presented with pain and swelling over left ankle since last six month. Biopsy was suggestive of GCT with ABC of lower third tibia. We managed this case with intralesional curettage using phenol and burr and bone graft harvested from left iliac crest for reconstruction of defect along with kwire fixation to achieve optimum anatomical restoration.
Postoperative X-ray
Preoperative X-ray
Conclusion: In cases of GCT, the management depends upon the various factors such as site, age,involvement of the bone, extent of bone involvement and whether there is articular involvement or not. Here Intra-articular GCT is managed with extended intralesional curettage with phenol. Bone graft plays a role of agent for reconstruction of the defect and kwire for anatomical reduction.
Keywords: Aneurysmal bone cyst, Distal end tibiar, Giant cell tumora.

Flexor Hallucis Longus Tendon Transfer for Neglected Tendo-Achilles Rupture: Is it the Procedure of Choice? A Case Series

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Purpose of the study: To assess the outcome of flexor hallucis longus tendon transfer in neglected tendo-Achilles rupture.
Introduction: Various procedures have been performed for neglected tendo-Achilles rupture: transfer of peroneus brevis, flexor digitorum

longus (FDL), flexor hallucis longus (FHL) tendons. Flexor hallucis longus has mechanical advantage compared to the other tendon transfers, as it has been shown to be stronger than peroneus brevis and almost twice as strong as the FDL tendon.

Materials and methods: This is a case series of 9 cases operated at JSS Hospital, Mysore. All cases presented with neglected tendo-Achilles rupture as confirmed by an USG scan. Preoperatively AOFAS ankle hindfoot scale score was assessed. All cases were operated with flexor hallucis longus tendon transfer. Postoperatively, the AOFAS score was assessed again and functional outcome was evaluated.

Results: The mean follow-up was 6 months. The mean AOFAS score was 53 preoperatively and 86 postoperatively. No wound complications noted in any of the 9 cases.

Conclusion: Though there are many techniques of tendon transfer for neglected tendo-Achilles rupture, current literature doesn't show which single technique is superior. This study shows that flexor hallucis longus tendon transfer improves functional outcome. Larger studies will be necessary to establish it as the standard procedure of choice.

Health Insurance and Diabetes Care in India

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Diabetes is an old friend of we Indians. Not just the heart, brain, eyes, kidneys and foot it has one more target and shrinks our pockets and thereby adding to the suffering. Our diabetes care in future also should include mandatory health insurance which will take care of outpatient and hospitalized diabetic complications thereby reducing financial stress on the family of a diabetic. We dont choose diabetes but we can surely choose to live longer and without complications. We also need to have kiosks for young indians who can screen themselves for diabetes and be a part of the treatment regime early if detected before target organ damage sets in. Diabetes is a long battle for the entire healthcare system but with health insurance we can control the disease and also control the cost of treatment This paper emphasis the need of health cover in our country like india which has its own sets of problems. In big forums and conferences we stress upon this new friend of diabetic patient health policy.

Study to Assess Outcome of Posterior Plating for Posterior Malleolar Fracture of Lower End Tibia and Fractures around Ankle

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Introduction: Intra-articular fracture with involvement of posterior malleolus usually bear worse long term prognosis and pertain high risk for degenerative changes. The decision regarding the surgical fixation of the posterior malleolus depend on its size. Larger displaced fragments of the posterior tibial plafond involving more than 25–30% of the articular surface require surgical reduction and stabilization. Direct reduction and fixation of the posterior malleolus from the posterior surface using posterolateral approach to the ankle with Buttress plate.

Materials and methods: Thirty patients with posterior malleolus fracture intra-articular surface were enrolled in this study. Patients underwent open reduction and fixation with buttress plate. Physical examination and radiographs were performed at the first, third and sixth month. Patient's pain and function were measured.

Results: The duration of study was 18 month and all the patients were followed up for at least 6 months. Ankle and foot score is 94. 23 patients attained full range of movement at ankle joint without any complications, 3 patients had delayed wound healing, 2 patients with varus deformity, and 2 patients developed joint stiffness.

Conclusion: All posterior malleoli fractures have to be fixed. Posterior plate is in buttress mode it gives better contour of joint, early mobilization will be started, avoids secondary displacement and prevents arthritis.

Arthrodesis of the First Metatarsophalangeal Joint for Severe Hallux Valgus Deformity

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Need for the study: To study the outcome following fusion of 1st MTP joint and to evaluate the efficacy of fusion in reducing the pain in patients with severe hallux valgus deformity.

Materials and methods: The current study involved 8 patients all having involvement of other toes like hammer toe deformity and all the patients had pain and difficulty in walking as the main complaint. Cosmesis was not the indication for surgery in any of the cases. A specific 1st MTP Fusion Plate was used for arthrodesis. HVA and 1-2IMA ANGLE used for Pre and Postop objective assessment. IFAS score used for postoperative assessment. The follow-up was from 4 months to 2 year 11 months postoperative.

Results: All nine of 9 first MTP joints had successfully fused with the primary procedure at an average followup of 3 months. The average corrections in the HV angle and 1–2IM angle were 30° and 9°, respectively. There was significant reduction in postoperative pain and deformity. Postoperative assessment showed no major activity restriction.

Conclusion: In the present study, arthrodesis of the first MTP joint for Severe hallux valgus deformity resulted in a high percentage of successful results at an average follow-up of over 16 months and has been a preferred treatment modality for such patients with severe deformity and pain.

Minimally Invasive Treatment for Chondroblastoma: A Welcome Change

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Chondroblastoma are rare, benign tumours characteristically arising in the epiphysis or apophysis of a long bone in young patients. We report a case of pre procedural biopsy proven chondroblastoma in the calcaneum in a 17 year old male which was managed by radiofrequency ablation, a novice minimally invasive method. The patient presented with non specific ankle pain and underwent radiological examinations which suggested a non aggressive bone tumour which was then confirmed to be a chondroblastoma. With this case report we demonstrate our successful experience with radiofrequency ablation for management of chondroblastoma.

Foot Drop by Intraneural and Extraneural Ganglion Cysts: A Report of Two Cases

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Ganglion cysts are pseudocysts with no epithelial lining of their own. These are non-neoplastic lesions filled with gelatinous material and originate from tendon sheath, ligament, bursa, joint capsule or subchondral bone. Rarely, they may present in an intramuscular location, away from the joint with no synovial communication. Upper limb involvement is more common and such lesions are usually found on the hand, wrist and ankle. In lower limb, dorsal surface of the foot is reported to be the most common site. Occurrence of ganglion cysts in lower limb causing compressive neuropathy is an even rarer combination. We report two cases of common peroneal nerve palsy, one with intramuscular ganglion cysts compressing upon the nerve and the other with intraneural ganglion cyst, resulting in foot drop. Both the patients underwent high resolution ultrasound and MRI for evaluation of the common peroneal nerve which revealed the cystic lesions. Operative management was planned to relieve the compressive neuropathy in the first case, excision biopsy of which proved it to be a ganglion cyst. The case with intraneural ganglion was managed conservatively as the patient refused for any surgical intervention.

Total Talar Allograft

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Total talar allograft – showpiece or much more?

Case description: 28 years male had a RTA, sustained open injury type 3B to ankle with isolated extrusion of the Talus at the site of accident. Patient was initially stabilized with ex fix application, wound debridement and SSG. Patient comes to our hospital after 5 months with healed soft tissue, ex fix still on with an absent Talus. A Talar allograft adequately matched to patient's dimensions was transplanted and fixed with 2 K wires for 6 weeks. The patient was ambulated non weight bearing for 6 weeks, after which he started partial weight bearing and progressed to full as per his tolerance within a span of 4 months. At his latest follow-up, (8 months) Tibio-pedal movement of 40° noted, and patient had a painless gait.

Discussion: Talar extrusion following high velocity injuries is a very rare possibility (2% of all Talar injuries). They are treated differently in different settings, ranging from implanting the patient's own Talus, Tibio-calcaneal arthrodesis, to 3D printed total Talar replacement. Allograft Talar replacement has been rarely performed with mixed results. In our case it was the most preferred treatment, due to availability.

Conclusion: Total Talar replacement is a viable option of treatment following Talar extrusion and loss since we can preserve the hindfoot mechanics to the maximum.

Primary Aneurysmal Bone Cyst of Talus

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A 17-year-old male patient presented to Patan hospital OPD with complains of dull aching pain over medial aspect of his right ankle for 6 months. It was also associated with minimal swelling on the same site which was gradually progressive. There was history of trauma on the same ankle while playing football about 1 year back which was managed by plaster cast. On examination, there was tenderness just below medial malleolus on deep palpation and an ill-defined fixed bony swelling of about 2 × 2 cm size was present also just below medial malleolus. Overlying skin appeared normal. X-ray showed a well-defined, expansile, lytic lesion involving the body of the talus with sharply demarcated margins. CT-Scan showed a mildly expansile, lytic lesion with internal trabeculations measuring 5 × 3.7 cm in the talus without any cortical breach or erosion suggesting an aneurysmal bone cyst. The talus was exposed by the postero-medial approach to the ankle. Extended curettage was done using distilled water as an adjuvant. Finally, the ensuing cavity was packed with harvested autologous cancellous iliac crest bone graft. Postoperatively, the foot and ankle was immobilized in a non weight bearing below knee plaster cast which was removed at 3 months. The patient is showing good radiological and functional outcome at 6 months. Primary Aneurysmal bone cyst of the talus is an extremely rare lesion; less than 20 cases have been reported in PubMed till 2012. An intralesional extended curettage followed by autologous bone grafting provided good results.

Keywords: Aneurysmal bone cyst, Bone graft, Curettage, Talus.

Reconstruction of Chronic Large Achilles Tendon Rupture with Hamstring Tendons: A Case Series

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Purpose: Chronic Achilles tendon rupture with size more than 4 cm has various management options. We used technique of reconstruction with hamstring tendon graft for chronic Achilles tendon ruptures. Objective of this study is to evaluate functional outcome of this technique.

Materials and methods: This is case series in which we retrospectively studied 8 patients (5 male and 3 female) of chronic Achilles tendon ruptures more than 4 cm who were treated with hamstring tendon reconstruction in between January 2017 to April 2018. We did not use any fixation device like screw, anchors. We made tunnel in calcaneum from lateral to medial to pass the graft. Gastrocsoleus power was calculated preoperatively and postoperatively by manual muscle testing (MMT).

Results: The mean age was 49.7 years. Mean defect size was 5.12 cm (range 4–7 cm). Postoperative weight bearing MMT was 5/5 in 3 patients, 4/5 in 4 patients, 3/5 in 1 patient. Non weight bearing MMT was 5/5 in 7 patients. One patient suffered complete failure with zero power due to postoperative infection. One patient had superficial infection which was successfully treated with oral antibiotics and regular dressing.

Conclusion: Hamstring tendon graft reconstruction is good alternate treatment method for chronic large Achilles tendon rupture.

Evaluation of Results of Minimally Invasive Endoscopic Management of Haglund Syndrome

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Purpose: The purpose of our study is to make a retrospective evaluation of endoscopic treatment of Haglund's syndrome in which all patients showed a Haglund projection on radiography and none had a cavovarus deformity.
Materials and methods: All 30 patients (40 heels) with mean age 50 years were evaluated preoperatively and postoperatively with parallel pitch lines and the American Orthopaedic Foot and Ankle Society (AOFAS) score.
Results: The mean follow-up was 30 months (range 3–45 months). There was no obvious intra or postoperative complications. In all operated heels postoperative radiographs showed the achievement of negative parallel pitch lines. The average AOFAS score improved from 40 to 96 at 9 months follow-up. 28 showed excellent results, 8 good results, 4 fair results and no poor results.
Conclusion: Endoscopic calcaneoplasty is an effective minimally invasive treatment option for Haglund disease in which there is failure of conservative treatment for 6 months.

Surgical Mangement of Müller–Weiss Disease

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Aim: Müller–Weiss disease is a rare condition, characterized by idiopathic collapse of the lateral aspect of navicular bone. It presents with chronic mid and hindfoot pain, mostly seen in middle-aged females. A different entity from Kohler's disease, which is self-limiting and resolves completely in childhood. We present our results on series of 4 cases of Stage III Müller–Weiss disease treated surgically.
Materials and methods: A total of 3 patients with 4 affected feet (1 with bilateral involvement) presented to VPS Lakeshore Hospital, Kochi, Kerala in our outpatient department over a period of 3 years. Müller–Weiss disease was diagnosed based on radiographic appearances demonstrating idiopathic collapse of the lateral part of navicular. There was no history of trauma in our patients. Affected feet were graded using maceira classification.
Results: All patients with a mean age of 50 years were treated surgically. Of the three patients, two had a triple arthrodesis, two had double arthrodesis and all had talo-naviculo-cuneiform fusion. Solid union was achieved in all cases. We followed up our patients for a period of 1 year and results were analysed using AOFAS scoring system.
Conclusion: Müller–Weiss disease is a complex idiopathic foot condition and is a diagnostic challenge. We advocate surgical management of the condition by peri-navicular arthrodesis with bone graft extention to include a talo naviculo-cuneiform fusion whenever indicated.

Comparative Study between Closed Reduction and Cast vs ORIF with Plating in Intra-articular Calcaneal Fractures

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Background: External fixation with cannulated screw or Internal fixation of displaced intraarticular calcaneal fractures in patients remains controversial. This is, in many cases, due to fear of loss of fixation and the risk of implant failure in osteoporotic bone. It is the objective of this study to compare the fixation strength obtained using calcaneal plates with cannulated screws, in the fixation of intra-articular calcaneal fractures.
Materials and methods: In 37 cases of intra-articular calcaneal fractures operated between august 2012 to September 2016 in mgm medical college kishanganj were treated with closed reduction and cannulated screw fixation and with open reduction and plate fixation using lateral extensile approach. Radiographs were obtained to assess reduction. The Wilcoxon signed rank test was used to test for differences in the results.
Interpretation: This study supports the mechanical viability of using calcaneal plates for the fixation of intra-articular calcaneal fractures in patients.
Keywords: Cannulated screw, Lateral approach, Locking screw, Plate fixation, Posterior tuberosity.

Lateral Approach to Calcaneum

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Objectives: Evaluation of outcomes of patients operated for calcaneus fracture through an lateral approach. Postoperatively patient were evaluated for wound complication and functional outcome.
Introduction: Lateral approach is considered and commonly followed approach for calcaneus fracture which visualise subtalar joint depression, calcaneocuboid joint, peroneal tendon, medial constant fragment and allows to treat comminuted fracture, and severe subtalar depression.
Materials and methods: Twelve patient are studied from Nov 2017 to may 2019, 24 which underwent for calcaneal fracture fixation through lateral approach. The patients were followed up clinically and radiologically for wound complication, AOFAS hindfoot score, VAS score, and X-ray.
Results: The average AOFAS hindfoot score was 78, and the mean VAS 1.8. The wound complication rate was 8.3% (1 out of 12), which patient were followed up till wound get healed.
Conclusion: Lateral approach for calcaneus is commonly used for intra-articular calcaneal fractures, to visualise articular comminution, subtalar joint depression which is associated with wound complication, we found less wound complication.

Traumatic Fracture in a Oatient of Osteopoikilosis

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Introduction: Osteopoikilosis or osteopathia condensans disseminata is a rare hereditary autosomal dominant sclerosing bone dysplasia. Patients are usually asymptomatic and the diagnosis is usually made incidentally on radiographs which show presence of symmetric, multiple, well defined, small ovoid areas of increased radiodensity clustered in peri-articular osseous regions with propensity for epiphyseal and metaphyseal involvement. There are no increased risks of pathological fracture in a case of osteopoikilosis and traumatic fracture healing in a case of osteopoikilosis is similar to fracture occurring in other normal patients.
Case description: A 34 years male, electrician came with history of accidental fall from height while working in office leading to development of pain and swelling over left lower leg and ankle diagnosed with Ruedi-Allgower classification type I pilon fracture (without fibula fracture) no distal neuro-vascular deficit. Patient was offered surgical treatment in form of open reduction and internal fixation of tibial fracture by plate osteosynthesis using antero-medial approach, showed complete union and was followed up for eight months.
Conclusion: Osteopoikilosis has a benign course and it should always be kept as a possible differential diagnosis for osteoblastic metastasis to avoid diagnositic dilemma. Diagnosis can be settled by routine X-rays (for type, extent and site of lesions, bones affected), clinical features of patient, histopathology and other systemic or pre-existing conditions.

Haglund Deformity in Achilles Tendinopathy

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Objectives: To evaluate role of Haglund deformity in Achilles tendinopathy.
Study design: Retrospective cross sectional study.
Materials and methods: Fifty patients of Achilles tendinopathy were selected as cases and 50 age and sex matched normal patients as controls. Lateral radiograph were taken and comparison of measurements between 2 groups were made for Haglund deformity height, Haglund deformity peak angle, Bohler's angle, Fowler–Philip angle, parallel pitch sign and calcification.
Results: Haglund deformity was seen in 44 cases and calcification was present in 43 patient as compared to presence of Haglund deformity in 38 radiographs of normal patients and calcification seen in 4 patients. Calcification in TA tendon and Hyperuricemia were more commonly present in Achilles tendinopathy patients and Haglund deformity itself alone may not be a cause of Achilles tendinopathy.
Conclusion: Haglund deformity itself may not be a cause for Achilles tendinopathy but Calcification and hyperuricemia may be associated with Achilles tendinopathy.

Clinicoradiological Outcome of Sub-talar *In Situ* Arthrodesis and Distraction Bone Block Arthrodesis in Malunited Calcaneal Fractures with Sub-talar Arthritis: A Retrospective Comparative Study

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Purpose: To compare the clinicoradiological outcome between *in situ* and distraction bone block arthrodesis for painful subtalar joint arthritis in patients with malunited calcaneal fracture.
Materials and methods: Patients presenting between March 2015 to March 2018 were included after thorough clinical and radiological evaluation. *In situ* group (A) had 22 patients and distraction group (B) had 14. All patients were evaluated at final follow-up (Mean—19.26 for *in situ* and 12.91 for distraction group) for functional outcome with AOFOS score and radiological parameters including talocalcaneal height (TCH), calcaneal pitch (CP), lateral talocalcaneal angle (LTCA) and talar declination angle (TDA).
Results: We observed statistically significant improvement in radiological parameters of talocalcaneal height ($p = 0.006$), calcaneal pitch ($p = 0.025$), lateral talocalcaneal angle ($p = 0.078$) and talar declination angle ($p = 0.02$) in the distraction group. AOFOS scoring post procedure (Maximum of 94) showed a rise in both groups but the difference between the groups (Mean in group B 80.8 and group A 73.83) was not significant ($p = 0.371$).
Conclusion: Distraction arthrodesis in mal-united calcaneal fractures with painful subtalar arthritis gives good improvement in radiological parameters as compared to the *in situ* group although there is no significant functional improvement and is fraught with complications like pseudoarthrosis and donor site pain in few.

Aneurysmal Bone Cyst of the Calcaneum

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Aneurysmal bone cysts (ABC) is a benign, tumor like lesion described as an expansile osteolytic lesion consisting of blood filled spaces of variable size, separated by connective tissue septa containing trabeculae or osteoid tissue and osteoclast giant cells. The lesion may arise de novo (65%) or secondarily (35%) in pre-existing benign or malignant lesions. It occurs more commonly in females, commonly presenting between the first and second decades of age. The commonly involved bones are the humerus, femur, tibia,radius and spine. The calcaneus is a rare site for ABC, comprising only 1.6% of the cases. In this poster, we present a case of a male patient with a 1 year history of heel pain that got worse and was accompanied by swelling and difficulty in walking. The magnetic resonance images of the calcaneus showed a contrast-enhanced expansile,multi loculated cystic lesion involving almost whole of calcaneum but without any soft tissue extension. Heterogeneous

hyperintense septae formations and blood level components were also detected. The pathological material was cureted out and the cavity was filled with bone cement. Histopathology confirmed the diagnosis as ABC. After four months, the patient was able to bear weight and walk withot any pain.

Factors Affecting Postoperative Length of Stay after Total Ankle Replacement

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Our study examined variables such as age, primary or revision ankle arthroplasty, anesthesia, postoperative analgesia and enhanced recovery protocols that could influence postoperative to stay after TAR. Pain management is important as it allows immediate mobilisation reducing postoperative morbidity and mortality. A total of 68 patients with TAR performed by four surgeons over a 2 year period were retrospectively reviewed. All patients undergoing primary or revision ankle arthroplasty were analysed for type of anesthesia, peripheral block, infiltration prior to closure and enhanced recovery protocol. Pain scores were recorded for each day of hospital stay until the patient was discharged. Multivariable logistic regression analysis was performed to identify patient characteristics and relevant intraoperative and postoperative variables that were associated with prolonged length of stay and postoperative complications. The age ranged for 45–81 there were 44 male and 24 female patients enrolled in the study. 24 patients had only spinal anesthesia, 12 had combined adductor and popliteal block with spinal anesthesia, 16 patients had the only peripheral nerve block, 10 patients had G.A. and 6 patients had combined spinal, peripheral block and infiltration prior to closure. 54 patients received an enhanced recovery protocol. Enhanced recovery protocol reduced length of stay by 30% (2 days) reducing the length of stay in both primary and revision length of stay.

Anatomic Variations of the Sural Nerve in Foot and Ankle with Relevance to Surgical Approaches: A Cadaveric Study

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Purpose of the study: Foot and ankle surgeons must be aware of the normal course of sural nerve and its variations while planning the surgical approaches. Inadvertent damage to the sural nerve can result in complications ranging from simple paresthesia to a painful neuroma.
Materials and methods: Variations of the sural nerve were observed during the routine dissection of human cadavers as a part of the medical curriculum for the first-year medical graduation program. A total of 50 lower limbs were dissected, and variations of sural nerve course, branching, and distribution in the leg and the foot were documented. These variations were correlated with the surgical approaches around foot and ankle.
Results: On the basis of the formation and course, the sural nerve in the back of the leg was divided into six types and in the foot into two types. In 10% of cases the medial sural cutaneous nerve and lateral sural cutaneous nerve are independent but communicate with each other, in other 10% of cases, they are independent but without communication. In 2% of cases, the lateral sural cutaneous nerve was absent and in rest of 78% of cases, the formation of sural nerve was normal by union of medial sural cutaneous nerve (MSCN) and lateral sural cutaneous nerve (LSCN). It was also observed that the site of formation of sural nerve was only in upper 1/3rd and also communication between the MSCN and LSCN found only in upper and lower 1/3rd of the leg without any communication in middle 1/3rd which is unique in our study.
Conclusion: Awareness regarding the anatomical variations of the sural nerve becomes clinically relevant especially with the posterolateral approach of the leg and lateral approach of the foot.

Rare Occurrence of Posttraumatic Tuberculosis: Ankle Joint with Mid-foot Involvement

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Rare occurrence of posttraumatic tuberculosis: ankle joint with mid-foot involvement abstract even after continued dedicated research and advancements in the field of tuberculosis (TB) musculoskeletal TB is becoming more and more common with atypical presentation and symptoms. Because of the same reason, musculoskeletal TB is difficult to diagnose early andleads to delay in the initiation of correct treatment and unwanted complications. Posttraumatic musculoskeletal tuberculosis is a very rare occurrence with very few reports available in literature. We hereby report our case diagnosed with posttraumatic occurrenceof tuberculosis of left ankle joint with involvement of mid-foot after ankle sprain. The casewas managed successfully through conservative means with 18 months of multidrug anti-tubercular therapy.
Keywords: Ankle joint, Mid-foot, Musculoskeletal, Posttraumatic, Tuberculosis.

Reverse Sural Flap—Soft Tissue Coverage for Ankle Defects in Peripheral Vascular Disease

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Introduction: Reverse sural artery flap is a reatively simple fasci-ocutaneous flap used to cover wounds of the lower leg and foot. Flaps in diabetics is a challenging process moresoever if associated with peripheral vascular occlusive disease.
Case description: This is a case series of three patients where reverse sural artery flap was used to cover ankle region defects in patients with documented peripheral vascular disease.
Results: All the patients were treated for their arterial disease with surgeries before the flap procedure. The patients underwent debridement of the ulcer, partial calcaneal removal in two patients and reverse sural artery flap cover. None required amputation.
Discussion: The medial sural artery is disease free in patients with arterial disease, which functions as an important collateral. Preoperative MRA or CTA is recommended in diabetics to assess the location and reliability of perforator, anatomy of vessel, assess the vascular disease.

Conclusion: Diabetics solely or along with peripheral vascular disease is not a contraindication for reverse sural flap or medial sural artery perforator free flap. Orthopaedic surgeons without microvascular training can also perform these flaps with adequate knowledge of the anatomy of the arterial status and the perforator location.

Evaluation of the Results of Platelet-rich Plasma Infiltration in Plantar Fasciitis in Relation to Pain Relief and Functional Outcomes in Prospective Manner

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Introduction: There are various treatments modalities available for plantar fasciitis but none have uniform success rate so it can be frustrating to treat and require careful management and patience to ensure optimal outcome. We have evaluated the result of PRP infiltration in plantar fasciitis in relation to pain relief, functional outcome and its possible complications.

Materials and methods: 37 consecutive patients (24 female and 13 male) with mean age of 35.48 years (20–63) included in study and PRP injected at the sites of maximal tenderness at plantar surface under regional block. Evaluation was done at 3 week, 3 month and 6 months with different parameters including skin reaction, pain and complications, while outcomes were assessed as per modified AOFAS score, VAS and FAAM score.

Results: VAS score decreased an average of 6.44 from baseline (mean 8.85 ± 1.13) to post infiltration follow-up (mean 2.41 ± 1.76), representing 73% pain relief. The AOFAS score improved an average of 22.33 from baseline (mean 67.75 ± 9.7) to final follow up (mean 90.08 ± 7.9), 33% improvement. Similarly, participants reported clinically significant improvement in FAAM score an average of 23.72 from baseline (mean 49.38 ± 5.2) to final follow-up (mean 73.10 ± 5.2), a 48% improvement. No complications were reported except temporary pain and swelling in 15 patients for average 3 days (2–7 days) which subsided gradually within a week.

Conclusion: In our experience PRP infiltration in plantar fasciitis has a high rate of success, relatively simple to perform, performed as day care procedure and has been with minimal complications.

Incorporating Radiological and Functional Outcomes in Intra-articular Calcaneal Fractures Managed with Different Modes of Treatment: A Prospective Comparative Study

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Introduction: 65–70% of calcaneal fractures are intra-articular and management of displaced intra-articular calcaneal fractures remains a controversy. Therefore with availability of computed tomography, quality implants and various tools we conducted a study to evaluate the radiological and functional outcomes of patients with intra-articular calcaneal fractures treated with operative management and compared the outcomes of patients with conservative methods.

Materials and methods: Fourty seven patients having 57 intra-articular calcaneal fractures were included and divided into two groups; group I of 22 patients having 27 intra-articular fractures were treated by open reduction and internal fixation; and group II of 25 patients having 30 intra-articular calcaneal fractures were treated by closed reduction and plaster application. Patients having extra-articular calcaneal fractures, undisplaced fractures (Sanders type I), pathological fractures and open fractures were excluded. The patients with peripheral vascular diseases, diabetes and skin infection were also excluded. Radiographs in lateral, axial and Broden's views and 3D CT scan of calcaneum were taken. The fractures were classified on the preoperative X-rays by Essex-Lopresti classification and by the system of Sanders et al. on CT scan. Clinical assessment was done with the AOFAS (American Orthopedic Foot and Ankle Society) hind foot scale, while radiological assessment was evaluated with preoperative and postoperative roentgenogram by measuring Bohler's angle, Gissane angle, Joint congruency and calcaneal height and width.

Results: Mean age was 37.7 years with 67% males and 34.5 years with 80% males in group I and II respectively. Post intervention follow-up was done for mean duration of 46.6 weeks and 37.7 weeks in group I and II respectively. In group I and group II the mean improvements in radiographs were: Bohler angle (20.40 vs 2.020) and in Gissane angle (10.00 vs 1.40). Joint congruency was restored in 87% and 12.5% of fractures in group I and group II. The mean improvement in calcaneal height in group I was 6.9 mm, whereas in group II, it was 0.8 mm. The mean AOFAS score at final follow-up was 84.6 in group I, whereas in group II was 78.6. In group I, 23 cases (85%) showed excellent to good results and only four cases (14.81%) showed fair to poor results whereas in group II, 11 cases (37%) showed excellent to good results and 19 cases (63%) showed fair to poor results. In group II, 100% of Sander's type II and type III fractures showed good to excellent results, while Sander's type IV 33.3% fractures showed good, fair and poor results each. In group II, 66.7% of Sander's type II fractures showed good to excellent results, and fair results were seen in 33.3% fractures. In Sander's type III, 30% fractures showed good results, while 70% fractures showed fair to poor results. Almost all the type IV fractures showed fair to poor results. In group I, during early follow up skin edge necrosis and wound dehiscence were common complications and subsided at final follow-up. Only one case progressed to osteomyelitis requiring removal of implant in group I, whereas in group II, ankle swelling, heel pain and heel widening were the most common complications than in group I cases.

Conclusion: A larger group of patients with a longer follow up is indicated to comment upon the statistically significant results of the two groups in terms of clinico-radiological and functional results. However, restoration of Bohler angle, Gissane angle, Calcaneal height and joint congruency is better in cases managed with open reduction and internal fixation than conservatively managed fractures. Also, the functional outcome is better in cases of group I as compared to group II. We concluded that operative treatment for displaced intra-articular calcaneal fractures results in a higher rate of return to pre-injury work but a higher rate of complications.

Open Fracture of the Talus with Extrusion: A Case Report

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Open fracture with extrusion of the talus is a rare injury. Some injuries are total talar extrusion without fractures and few cases are fracture neck

of talus along with extrusion. There are case reports in the literature and different treatment options are mentioned. Although there is no consensus regarding treatment but all of the authors have preserved the talus along with external fixation, internal fixation with screws with or without fusion of the tibiotalocalcaneal arthrodesis. We present a case of high energy trauma with open fracture of talar neck with extrusion. The patient was treated with debridement and external fixation initially followed by internal fixation with screws. The patient at 1 year follow-up had excellent function with painless range of motion. There were no signs of avascular necrosis in radiograph at 1 year.

Simple and Prudent Alternative in the Managements of Lytic Lesion of Talus

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Giant cell tumour (GCT) of the bone is known for its aggressive behavior and tendency to recur. Zolendronic acid (a bisphosphonate) is being used in various cancers for osteoporosis with an aim to reduce the resorption of bone, and as an adjuvant treatment for the management of GCT of bone. Recent studies indicate that intravenous infusion of zoledronic acid decrease the local recurrence of GCT of bone. Giant cell tumour commonly involves the epiphyseometaphyseal end of long bones. Giant cell tumour rarely involves small bones of hand and foot. Giant cell tumour of talus bone is a rare entity and very few cases were reported in literature so far. We report about one 24 year old male presented with pain and swelling of right ankle right ankle for one year with restriction of movement of right ankle and subtalar joint. Plain radiography and computerized tomography scan (CT) were suggestive of GCT of talus. A Single dose of intravenous zoledronic acid was given prior to the surgery. Through an anterolateral approach the talar dome was reached, a window was created, extended current age was done and the cavity was filled with autologous cartico-cancellous graft from iliac crest. Two more doses of intravenous zoledronic acid were given postoperatively four weeks apart. Postoperatively X-rays revealed early osteo integration but biopsy proved decisive as it was reported as chondroblastoma.

Keywords: Chondroblastoma, Extended curettage, Giant cell tumour, Histopathology, Zoledronic acid.

Tubercular Tenosynovitis of the Extensor Digitorum Longus at Right Ankle Joint

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Tuberculosis of the extensor tendon sheath at ankle joint is an extremely rare extrapulmonary manifestation. We report a case of tubercular tenosynovitis involving the extensor digitorum longus at right ankle.

Haglund

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Haglund's deformity is common cause of posterior heel pain. It is managed conservatively in initial stage. Many surgical techniques have been described in literature, however, there is no consensus regarding best technique for this condition. Purpose of this study was to evaluate improvement of AOFAS-hind foot score in case of patients with haglund's deformity and tendo-Achilles (TA) reconstruction with swivelock suture anchors (Arthrex). Total 7 female patients (10 feet) with mean age of 54.86 ± 4.91 years were operated from Jan 2018 to March 2019. Mean preoperative HFS was 53.86 ± 7.58. Lazy S incision was used for skin and TA was detached from insertion site. After excision of haglund's deformity, reconstruction of TA was done using 4.75 mm biocomposite Swivelock (Arthrex). Minimum follow-up period was of 3 months (range 3–16 months). Mean postoperative HFS calculated at last follow-up was 87.57 ± 4.86. No postoperative complications like skin infection, wound dehiscence, tendon avulsion, implant failure etc. was seen. Speedbridge technique is a promising option for TA reconstruction, however long term follow-up is required for further validation of this technique.

Functional Outcome Following Fixation of Closed and Type I Open Tibial Pilon Fracture Using Locking Compression Plate

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Tibial pilon fractures are common and account for fewer than 10% of all lower-extremity fracture. The main aim of this study was to assess the functional outcome following treatment of pilon fractures with locking compression plate (LCP) and also to analyse the complications. Twenty five cases of closed and type I open pilon fractures were operated with LCP during August 2016 to March 2018 at our institute. Functional outcome was assessed using American orthopaedic foot and ankle society score (AOFAS) and visual analogue scale (VAS) at 3, 6 and 12 months postoperatively. At 12 months, the mean AOFAS was 84.24. Five patients (20%) had score more then 90 (excellent), 11 (44%) had score between 81–90 (good), 8 (32%) had score between 71–80 (fair) and 1 (4%) had 70 (poor). Mean AOFAS score improved from 71.36 (at 3 month) to 79.96 (at 6 month) and 84.24 (at 1 year). Mean VAS score at the end of 1 year was 22.4 mm. 17 (68%) cases in the study had fracture union without any complications. 8 (32%) cases had postoperative complications ranging from superficial wound infection to delayed union and secondary arthrosis. Tibia pilon fractures are challanging injuries. A constant balance has to be maintained to get anatomical reduction with minimal soft tissue handling. In a closed and type one open fracture low profile LCP is best option.

Anatomical Structures at Risk in Proximal Fifth Metatarsal Fracture Fixation: A Cadaveric Study

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Introdution/purpose: Jones fractures are fractures of the proximal fifth metatarsal involving the metaphyseal–diaphyseal junction. They have an increased risk for refracture, delayed union and nonunion secondary to

poor blood supply to this área. They are usually treated conservatively, but when chosen for surgical treatment percutaneous fixation with screws is the most used. Few studies have evaluated the complications of injury to nearby structures during the percutaneous fixation. It has been shown, however, that the peroneal brevis and longus, the cuboid, and the sural nerve lie in close proximity to this starting point and are, therefore, at theoretical risk of injury. The study aims to evaluate the presence of injury of the structures at risk and to measure the distance of these structures to the entry point.

Materials and methods: Eleven fresh-frozen below-the-knee specimens underwent standard operative fixation for a Jones fracture via the "High and inside" percutaneous technique. A guide wire was placed through the medullary canal and confirmed on fluoroscopy. The cannulated drill with drill sleeve was then placed over the wire and advanced to the diaphysis. The guide wire was left and the skin and subcutaneous tissues were carefully removed from the lateral midfoot to fully expose the structures at risk. The guidewire was then removed, and then the solid screw was placed. Neurovascular and tendinous structures were assessed for any injury. The distance of the wire in the base of fifth metatarsal and these structures was measured and documented, including the branches of the sural nerve, cuboid, fourth metatarsal, peroneus longus, and peroneus brevis tendons.

Results: The structure with the shortest average distance from the pin was the peroneus brevis, measuring 0.91 mm (±1.22 mm SD), followed by the cuboid articular surface, sural nerve, peroneus longus, and base of the fourth metatarsal, respectively. The pin had damaged the peroneus brevis in 5 of 11 cadavers. However, it did not damage at the tendon insertion point in any specimen. The average distance from the tendon insertion point was 7.2 mm. The furthest measured distance was 10 mm, while the closest was 3 mm. The screw head contacted the articular surface of the cuboid in 3 of 11 cadavers. There were no instances of pin contact with or damage to the peroneus longus, sural nerve, or fourth metatarsal head.

Conclusion: This is the only study that evaluated the risk of injury the structures after a procedure that simulated an actual surgical act. It is also the only one that was aware of the risk of tendon injury not only in its insertion but also in its path during the placement of the wire and drill. We conclude that percutaneous fixation of fractures of the base of the fifth metatarsus presents a risk of partial lesion of the peroneus brevis tendon and lateral aspect of the cuboid. Therefore, specific care with these structures can be taken during the procedure.