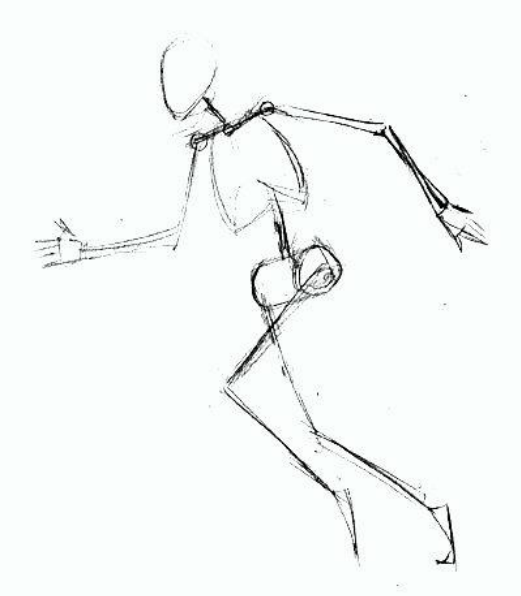
University Hospitals Bristol NHS
NHS Foundation Trust

Trauma & Orthopaedics

Evidence Update



August 2017 (Quarterly)

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Recognising success
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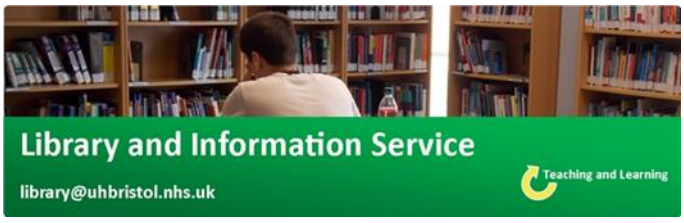
Our hospitals.



Training Calendar 2017

All sessions are one hour

August (12.00-13.00)

4th (Fri)	Critical Appraisal
9th (Wed)	Literature Searching
15th (Tues)	Interpreting Statistics
24th (Thurs)	Critical Appraisal

September (13.00-14.00)

Fri 1st	Literature Searching
Mon 4th	Critical Appraisal
Tue 12th	Interpreting Statistics
Wed 20th	Literature Searching
Thu 28th	Critical Appraisal

October (12.00-13.00)

Fri 6th	Interpreting Statistics
Mon 9th	Literature Searching
Tue 17th	Critical Appraisal
Wed 25th	Interpreting Statistics

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OUTREACH: Your Outreach Librarian can help facilitate evidence-based practise for all in the Orthopaedics team, as well as assisting with academic study and research. We can help with **literature searching, obtaining journal articles and books**, and setting up individual **current awareness alerts**. We also offer one-to-one or small group training in **literature searching, accessing electronic journals, and critical appraisal**. Get in touch: library@uhbristol.nhs.uk

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Updates

UpToDate®

OpenAthens login required. Register here: https://openathens.nice.org.uk/

Severe extremity injury in the adult patient
- Open fracture grading
- Hard signs of arterial injury
- Summary and recommendations

Anesthesia for orthopedic trauma
- Anesthesia for lower extremity trauma
- Proximal upper extremity fractures
- Summary and recommendations

Posterior cruciate ligament injury
- Indications for orthopedic consult or referral
- Summary and recommendations

Antimicrobial prophylaxis for prevention of surgical site infection in adults
- Orthopedic surgery
- Summary and recommendations
-

Medical consultation for patients with hip fracture
- Thromboembolic prophylaxis
- Unfractionated heparin
- Summary and recommendations

Prevention of prosthetic joint and other types of orthopedic hardware infection
- S. aureus decolonization
- Summary and recommendations

NICE National Institute for Health and Care Excellence

The available evidence on demineralised bone matrix in trauma and orthopaedic surgery: A systematic review

Source: PubMed - 01 July 2017 - Publisher: Bone & Joint Research Read Summary

Early or delayed reconstruction in multi-ligament knee injuries: A systematic review and meta-analysis

Source: PubMed - 14 July 2017 - Publisher: The Knee Read Summary

Femoral nerve block versus fascia iliaca block for pain control in total knee and hip arthroplasty: A meta-analysis from randomized controlled trials

Source: PubMed - 01 July 2017 - Publisher: Medicine Read Summary

2017 ACR/American Association of Hip and Knee Surgeons Guideline for the Perioperative Management of Antirheumatic Medication in Patients With Rheumatic Diseases Undergoing Elective Total Hip or Total Knee Arthroplasty

08 August 2017 - Publisher: Arthritis Care and Research Read Summary

Cochrane Library

Deliberate hypotension for orthopaedic surgery

Jia Jiang , Yun Yue , Bo Li and Ran Zhou

Online Publication Date: July 2017

KnowledgeShare

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Journal Tables of Contents

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Journal of Bone and Joint Surgery
July 19 2017, Volume 99, Issue 14

Journal of Orthopaedic Trauma
August 2017, Volume 31, Issue 8

Injury
July 2017, Volume 48, Issue 7

Strategies in Trauma and Limb Construction
August 2017, Volume 12, Issue 2 (triannual)

Clinical Orthopaedics and Related Research
August 2017, Volume 475, Issue 8

Recent Database Articles related to Orthopaedics

Below is a selection of articles related to orthopaedics recently added to the healthcare databases.

The role of teriparatide to an orthopedic surgeon and its effectiveness on the fracture healing process

Author(s): Coppola C.

Source: Osteoporosis International; 2017; vol. 28

Publication Type(s): Conference Abstract

Abstract: Introduction: Despite the use of drugs for osteoporosis can prevent the risk of further fracture in 30-70% of cases, today only about 20% of patients with fragility fractures receive adequate drug therapy at discharge. This is due to several reasons: The working environment of ortho-trauma surgeons, as many orthopedic surgeons do not consider the post-fracture secondary prevention being a responsibility of their daily work; fears that treatment for osteoporosis may interfere with the healing of the fracture and cause adverse reactions or drug interactions, especially in geriatric patients undergoing medical polypharmacy; lack of knowledge about the prescription and reimbursement criteria, availability to compile dedicated sheets, as well as lack of consideration of the cost-benefit related to the use of anti-osteoporosis drug therapy. In addition, many of these patients often present fragility fractures of the long bones, related to vertebral fractures, with delayed consolidation due to the poor bone stock quality (5-30%), that may require further surgical treatments. Teriparatide results in a rapid and greater increase in vertebral bone mineral density (BMD) and a decreased risk of vertebral and non-vertebral fractures in postmen-opausal women and men with osteoporosis, providing also en-couraging preclinical results in fracture healing. Objectives: Pointing out the correct use of PTH, according to the eligibility prescription criteria, and its effectiveness on fracture healing process in fragility fractured patients with complex long bones fracture or refractures, with a high risk of delayed or nonunion. Methods: We present several patients with severe osteoporosis who reported multiple vertebral fractures and refractures, and complex long bone fractures (Humerus AO12-C1, Femur AO31-B3, AO32-A3, AO33-A3, and Tibia AO42-B1, AO43-C3) with delayed union, who received Teriparatide. Results: All patients healed (avg follow up 4yrs), without any systemic or local complications on the fracture site. Conclusion: According to the latest literature data, Teriparatide confirmed, in our clinical series, to improve and accelerate fracture healing and enhance bone formation, even in fragility fractures with a high risk of delayed or nonunion.

Treatment strategies on managing complex acute and sub-acute lower limb trauma in patients with osteoporosis using circular ilizarov frame

Author(s): Iliopoulos E.; Morrissey N.; Cho S.; Khaleel A.

Source: Osteoporosis International; 2017; vol. 28

Publication Type(s): Conference Abstract

Abstract: Background: The treatment of complex acute fractures and non-unions is a challenge for the orthopaedic surgeons. The management of such conditions is becoming even more challenging

in poor quality bone due to osteoporosis; and often we have to alter the normal practice to overcome these problems. The use of circular Ilizarov frame in such conditions could be a reasonable option, but is still not well established in the literature for elderly and osteoporotic patients. Aim: The purpose of this study was to illuminate the technical alternations of the management of the osteoporotic bone and demonstrate the outcomes after severe acute and sub-acute lower limb trauma in elderly patients, who were treated with circular Ilizarov frame. Materials and Methods: Data from all elderly patients (aged over 65 years), treated with an Ilizarov circular frame for severe acute and sub-acute lower limb trauma, between January 2002 and December 2014, was collected. Clinical, radiological and quality of life questionnaire (SF-12) data, mortality, complication and revision data were also collected. The intact joint above or below was used as a reference to identify the mechanical axis of the limb. The mechanical axis was used in order to achieve alignment and a stable ring of appropriate size was applied with at least two wires on each ring. A separate wire was added away of the ring, to increase the stability of the ring when necessary (drop wire). The wires were tensioned with increased tension to 130kg force. Four connective rods were used to connect the rings, in order to achieve a more stable frame. The frame crossed the joint for intra-articular fractures in order to protect the reduction and allow immediate full weight bearing post-operatively. Olive or plain wires were added to achieve fracture reduction or compression across the non-union. Results: During this period we treated 44 elderly patients with Ilizarov circular frame at a mean of age 70. 67 years. Indications were tibia plateau fractures (Schatzker IV-V-VI) (41. 9%), pilon fractures (20. 9%), miscellaneous complex lower limb acute fractures (20. 9%) and lower limb non-unions (16. 3%). Mean time in the frame was 176. 71 +/-80. 6 days. Mortality and complication rates were low (2. 7-5. 4%) at a mean follow-up 4. 2 years. There was no case of new induced septic arthritis or deep infection. Physical and Mental components of SF-12 questionnaire returned to normal for that age group (43. 55 and 51. 55 respectively). There was no difference between the subgroups concerning the physical and mental subjective (PCS and MCS SF-12 component) outcomes (p>0. 05). There was no significant correlation between age and subjective outcomes, neither between time of follow-up and subjective outcomes. Conclusions: Complex acute and sub-acute lower limb trauma in patients with osteoporosis can be treated safely and reliably by using circular Ilizarov frame with good quality of life results.

Seasonal variation in orthopedic trauma patients-An experience from central India

Author(s): Shukla R.; Jain N.; Agarwal U.; Sheikh T.; Jain R.

Source: Journal of Clinical Orthopaedics and Trauma; 2017

Publication Type(s): Article In Press

Abstract: Objectives: This study aims to determine the various epidemiological factors responsible for orthopedic trauma cases: how do weather patterns, month, season and public working schedule influence the daily frequency of orthopedic trauma. Material and methods: This was a descriptive study performed in the Department of Orthopedics at a tertiary care centre in central India Participants: 7980 trauma cases reported in our study period. Study variables: Demographic characteristics of the cases, time, day, the month of injury and type of trauma and cause of trauma. etc. Statistical analysis: Proportions. Results: In our study period from 2005 to 2016, there were total 7980 admissions, the annual incidence of trauma was 22.78%. RTA was the commonest cause of injury (46.85%). Most common age group affected was 11-40. year age group (64.06%), with the predominance of Male (67.40%) and rural population (72%). The commonest victims of trauma were labourer (37.66%). Maximum cases of trauma occurred during summer (58.9%). Fracture of upper extremity especially around Elbow was common which were 987 (26.41%) amongst which the fracture supracondylar humerus in pediatric age group was most common around 456. And in rainy season and winter season, there was the dominance of lower extremity fracture which was fracture around Ankle and Foot (i.e 557; 23.59%) and fracture of tibia bone (i.e 516; 27.4%) respectively.

Conclusion: Orthopedic trauma at a tertiary health care trauma center do vary significantly with the weather and are highest in the Summer season.

Low-Energy Hawkins Type III Talar Neck Fracture-Dislocation With Neurovascular and Tendon Entrapment in a Pediatric Patient

Author(s): Kizilay Y.O.; Aytan O.

Source: Journal of Foot and Ankle Surgery; 2017

Publication Type(s): Article In Press

Abstract: Several serious complications can occur after talar neck fractures. However, these fractures are extremely rare in children. We present a pediatric low-energy Hawkins type III fracture-dislocation that had excessive displacement accompanied by neurovascular and tendon entrapment. A 9-year-old male patient referred to our hospital 5 hours after jumping off a swing in a children's playground. An excessively displaced talar neck fracture-dislocation was observed at the initial evaluation. The patient underwent urgent surgery. The tibialis posterior flexor digitorum longus tendons, posterior tibial artery, and tibial nerve were entrapped at the fracture site. The talar neck fracture was reduced using open reduction. The neurovascular structures and tendons were removed from the fracture site. The fracture was fixed using two 4.5-mm cannulated screws. The patient was able to bear full weight at 10 weeks postoperatively. At 6 months, the patient was able to walk unassisted with full ankle range of motion. However, at 2 years, his American Orthopaedic Foot and Ankle Society Ankle-Hindfoot scale score had decreased to 72 points, and we observed avascular necrosis in the talar head. In conclusion, talar fractures are rare but can lead to serious complications. In the pediatric population, even low-energy trauma, such as had occurred in our patient, can result in severe displaced fracture-dislocations. After severe displaced fracture-dislocations, important soft tissue structures can become entrapped between fracture fragments, and surgeons should be aware of this situation when considering using closed reduction.

The crush index: Orthopedic trauma as an economic indicator

Author(s): Arshi A.; Barad J.H.; Allis J.B.; Soohoo N.F.; Johnson E.E.; Patel R.K.

Source: Orthopedics; 2017; vol. 40 (no. 4); p. 248-255

Publication Type(s): Article

Available in full text at Orthopedics - from ProQuest

Abstract: The purpose of this study was to evaluate the relationship between economic activity and the incidence of high-energy orthopedic trauma. California's Office of Statewide Health Planning and Development patient discharge database was queried to identify monthly orthopedic trauma incidence from 1995 to 2010. Patient inclusion required 1 diagnosis code and 1 associated procedural code for fractures of the femur, tibia, ankle, pelvis, or acetabulum. Data on composite market indices, energy and transportation use, and unemployment were obtained from government sources. Statistical analysis was performed using univariate and multivariate linear regression. The average monthly incidence of orthopedic trauma was 2.92 cases per 100,000 people. Of 15 economic indicators analyzed with univariate regression, 7 variables correlated with trauma incidence to statistical significance. Dow Jones Industrial Average (P=.032), Standard & Poor's 500 (P=.034), vehicle miles driven (P

Findings from subacute visual oculomotor assessments in mTBI patients differ from agematched trauma and healthy controls

Author(s): Matuseviciene G.; Moller M.; De Boussard C.N.; Johansson J.; Pansell T.

Source: Brain Injury; 2017; vol. 31 (no. 6); p. 810-811

Publication Type(s): Conference Abstract

Abstract: Background: Many patients with MTBI return to previous activities within a few weeks of injury, but up to 40% of patients report persistent symptoms. Disruptions in visual functioning after MTBI have recently been described, and these may play a role in sustaining or aggravating chronic symptoms. The diagnosis of MTBI is mostly based on selfreported symptoms. Objectively signs for diagnosis and monitoring of MTBI are still lacking. Reported rates of visionrelated symptoms in MTBI vary from 1% to 75%. Objectives: The aim of the study was to investigate whether objectively measurable visual disturbances are observed more often in MTBI patients than in two groups of age-matched controls: individuals with minor trauma without head injury, and healthy controls. In addition, we evaluated whether selfreported vision-related symptoms after MTBI correlated with objectively detectable changes in visuomotor performance. Methods: This prospective observational study included 15 consecutiveMTBI patients (age 18-40) with GCS 14-15 at presentation to the emergency department, and required acute CT scan, and two age-matched control groups: 15 patients with minor orthopaedic trauma without head injury and 15 age-matched healthy controls. All study participants completed questionnaires and were examined by an optometrist 7-10 days and 3-6 months after the injury. The following outcome measures were assessed: Rivermead Postconcussional Symptoms Questionnaire (RPQ), Hospital Anxiety and Depression Scale (HADS), Revised Convergence Insufficiency Survey (CISS, assesses near vision-related symptoms). Visual examination included assessment of visual acuity, accommodation, and eye alignment. Oculomotor measures of saccades, fixation, and reading performance were recorded with eye tracking. Results: Patients with MTBI reported statistically significantly more near vision-related symptoms in CISS compared to each of the control groups, while no difference was observed between both control groups. In MTBI group, CISS median value (24) at the baseline was above the cut-off score (21), reflecting abnormal symptom levels. Median values of CISS score were reduced in MTBI group at the follow-up. The CISS score in control groups were below cut-off level at both time points. A significantly worsened near point of convergence was found in MTBI patients compared to control groups at baseline, but not at follow-up. A correlation was found between increased near vision symptom score (CISS) and reduced positive fusional vergence at near ($r = -0.6$; $p = 0.02$). MTBI patients reported significantly more symptoms in RPQ than controls at the baseline. No difference in RPQ symptom load was found between groups at follow-up. RPQ symptom load decreased significantly in MTBI group between the baseline and follow-up. Conclusion: Preliminary results suggest that during the subacute period, there are transient measurable visual changes in MTBI patients.

Atypical femur fractures: a survey of current practices in orthopedic surgery

Author(s): Schneider P.S.; Wall M.; Harvey E.J.; Morin S.N.; Brown J.P.; Cheung A.M.

Source: Osteoporosis International; Aug 2017 ; p. 1-6

Publication Type(s): Article In Press

Abstract: Summary: The results of a self-administered online survey demonstrate that orthopedic surgeons' management practices for AFF are variable. These data will inform the development of clinical practice guidelines. Introduction: We aimed to determine current AFF treatment practices of orthopedic surgeons to inform clinical practice guideline development. Methods: A self-administered online survey was developed and sequentially posted on the Orthopaedic Trauma Association (OTA) website from July to August 2015 and the Canadian Orthopaedic Association

(COA) website from December 2015 to January 2016. Level of confidence in diagnosis and treatment as well as treatment preferences between respondents who self-identified as trauma surgeons vs. non-trauma surgeons were compared. Results: A total of 172 completed surveys were obtained (OTA, N = 100, 58%; COA, N = 72, 8%). Seventy-eight percent of respondents had treated >=1 AFF in the previous 6 months. Seventy-six percent reported feeling extremely or very confident in diagnosing AFF (trauma 84% vs. non-trauma surgeons 70%, p = 0.04), and 63% reported feeling extremely or very confident in treating AFF (trauma 82%, non-trauma surgeons 50%, p

Optimizing Radiation Dose in Computed Tomography of Articular Fractures

Author(s): Mansfield C.; Komperda K.; Rehman S.; Ali S.; Zhao H.

Source: Journal of Orthopaedic Trauma; Aug 2017; vol. 31 (no. 8); p. 401-406

Publication Type(s): Conference Paper

Abstract: Objectives: To determine whether a substantially lowered radiation protocol would provide satisfactory information for the surgeon, using the distal tibia as a model. Methods: Eleven adult cadaveric distal tibia specimens were used to create Orthopaedic Trauma Association (OTA/AO) 43C distal tibia fractures with varying displacements in 2 planes. Each specimen was scanned at 3 modified protocols, which were then subsequently read by both qualified attending orthopaedists and midlevel residents. Observer reliability was evaluated, as well as confidence levels of identifying fracture pattern and treatment protocols. Results: On average, there was less than a millimeter of variability in the measured gap to true gap as a whole (mean = 0.74 mm, P

Antimicrobial and bone-forming activity of a copper coated implant in a rabbit model

Author(s): Prinz C.; Rychly J.; Neumann H.-G.; Elhensheri M.

Source: Journal of Biomaterials Applications; Aug 2017; vol. 32 (no. 2); p. 139-149

Publication Type(s): Article

Abstract: Current strategies in implant technology are directed to generate bioactive implants that are capable to activate the regenerative potential of the surrounding tissue. On the other hand, implant-related infections are a common problem in orthopaedic trauma patients. To meet both challenges, i.e. to generate a bone implant with regenerative and antimicrobial characteristics, we tested the use of copper coated nails for surgical fixation in a rabbit model. Copper acetate was galvanically deposited with a copper load of 1 mug/mm2 onto a porous oxide layer of Ti6Al4V nails, which were used for the fixation of a tibia fracture, inoculated with bacteria. After implantation of the nail the concentration of copper ions did not increase in blood which indicates that copper released from the implant was locally restricted to the fracture site. After four weeks, analyses of the extracted implants revealed a distinct antimicrobial effect of copper, because copper completely prevented both a weak adhesion and firm attachment of biofilm-forming bacteria on the titanium implant. To evaluate fracture healing, radiographic examination demonstrated an increased callus index in animals with copper coated nails. This result indicates a stimulated bone formation by releasing copper ions. We conclude that the use of implants with a defined load of copper ions enables both prevention of bacterial infection and the stimulation of regenerative processes.

Functional Outcomes Post Lisfranc Injury - Transarticular Screws, Dorsal Bridge Plating or Combination Treatment?

Author(s): Lau S.; Guest C.; Oppy A.; Hall M.; Tacey M.; Joseph S.

Source: Journal of Orthopaedic Trauma; Aug 2017; vol. 31 (no. 8); p. 447-452

Publication Type(s): Conference Paper

Abstract: Objective: To identify whether transarticular screws, dorsal bridging plates or a combination of the 2 result in the best functional outcome after Lisfranc injury. Design: Case series. Setting: Level one trauma center. Patients: Fifty patients who underwent surgical fixation of Lisfranc injuries over a 6-year period were retrospectively reviewed. Intervention: One of 3 treatment arms: transarticular screw fixation alone, dorsal bridge plating alone or a combination of dorsal bridge and transarticular screw fixation. Main Outcome Measures: The primary outcome measures were 1 of 2 midfoot scores - the American Orthopaedic Foot and Ankle Society (AOFAS) Midfoot Score and the Foot Function Index (FFI) Score. Secondary results included postoperative complications. Results: Quality anatomical reduction is the best predictor of functional outcomes (FFI - P = 0.008, AOFAS - P = 0.02). Functional outcomes with both FFI and AOFAS scores were not significantly associated with any of the fixation groups (FFI - P = 0.495, AOFAS - P = 0.654) on univariate analysis. Injury type by Myerson classification systems or open versus closed status was also not significantly associated with any fixation group. Open exposures were more likely to result in soft-tissue complications, but there was no significant difference in metalware failure or need for removal. Conclusion: Functional outcomes after Lisfranc fractures are most dependant on the quality of anatomical reduction and not the choice of fixation implant used.

What Is the Diagnostic Accuracy of the Duck Walk Test in Detecting Meniscal Tears?

Author(s): Van der Post, A; Noorduyn, J C A; Scholtes, V A B; Mutsaerts, E L A R

Source: Clinical orthopaedics and related research; Aug 2017

Publication Type(s): Journal Article

Abstract:BACKGROUNDClinical weightbearing provocation tests, like the duck walk test, may be of value in diagnosing or screening for medial meniscal tears. However, evidence of the diagnostic accuracy of the duck walk test is lacking.QUESTIONS/PURPOSES(1) To determine the sensitivity and specificity of the duck walk test in diagnosing medial meniscal tears. (2) To determine whether tear location, tear cause (traumatic versus degenerative), and ACL insufficiency were associated with differences in the sensitivity and specificity of the test.METHODSA convenience sample of 136 patients of all ages was retrospectively analyzed by evaluating the outpatient knee clinic appointment list of one orthopaedic surgeon for patients with a broad range of knee injuries who had a prior MRI before (24%) or after (76%) physical examination and had a duck walk test stated in their patient records. Of 230 patients with MRI requested by one orthopaedic surgeon attributable to knee complaints, 136 (59%) fulfilled the inclusion criteria; 70 (52%) patients were male and 66 (49%) were female, with a mean age of 42 (± SD 14) years. The duck walk test was performed in case of suspected meniscal injury, based on mechanism of injury, general joint line pain, and/or mechanical complaints (ie, locking, giving away). The test is performed by squatting and "waddling" before rising and is positive in case of general joint line pain or painful "clicking". Interobserver repeatability was not evaluated, but the test is well defined and leaves little room for difference in interpretation. Diagnostic accuracy measures were evaluated. Since the convenience sample in this study consisted of patients who had a duck walk test and MRI, and a positive result of the duck walk test almost certainly increased the probability that MRI would be ordered in the majority (76%) of

the patients, the test properties calculated here-especially sensitivity-should be considered inflated.RESULTSThe calculated sensitivity of the duck walk test was 71% (95% CI, 59%-81%) and there was low specificity of 39% (95% CI, 27%-52%). We found no difference in sensitivity between medial (67%; 95% CI, 51%-80%) and lateral (76%; 95% CI, 50%-92%; p = 0.492) meniscal tears. With the numbers available, we compared these patients with patients without a history of trauma and with an intact ACL. We found no difference among patients with traumatic tears (79%; 95% CI, 59%-91%; p = 0.253) and in patients with ACL tears (77%; 95% CI, 46%-94%; p = 0.742).CONCLUSIONSBecause of the issue of verification bias, the actual sensitivity of this test in practice is likely much lower than the calculated sensitivity we observed. In addition, the test did not seem to perform better in patients with trauma or ACL insufficiency, nor was it more effective in detecting medial than lateral tears, although the numbers on some of those comparisons were rather small. Based on these results, we conclude that used alone, the duck walk test likely has little value in practice as a screening test. However, it is conceivable that it could be used in combination with other provocative tests for screening purposes. Future studies might consider using it as a means to best identify which patients should undergo MRI for the possibility of a meniscal tear.LEVEL OF EVIDENCELevel III, diagnostic study.

The benefits of hardware removal in patients with pain or discomfort after fracture healing of the ankle: a systematic review protocol.

Author(s): Thune, Alexandra; Hagelberg, Mårten; Nåsell, Hans; Sköldenberg, Olof

Source: BMJ open; Aug 2017; vol. 7 (no. 8); p. e014560

Publication Type(s): Journal Article

Available in full text at BMJ Open - from ProQuest

Abstract:INTRODUCTIONFor any orthopaedic surgeon working with trauma; ankle fractures are one of the most common injuries treated. The treatment of ankle fractures can be conservative, using external fixation, but more commonly the fractures are treated with open reduction and internal fixation. Residual pain and discomfort are common in patients after surgical treatment of fractures of the ankle. Sometimes it is difficult to determine whether the pain or discomfort is due to the implants left in situ or the primary injury itself. In many cases, the decision is made to remove the implants. Extraction of internal fixation material from the ankle is a common procedure in many orthopaedic clinics. There are no evidence-based guidelines or consensus regarding the effect of hardware removal from the ankle. The aim of this protocol is to describe the method that will be used to collect, describe and analyse the current evidence regarding hardware removal after fracture healing of the ankle.METHODS AND ANALYSISWe will conduct a systematic review of studies that were published after 1967 regarding the benefits of hardware removal in patients with pain or discomfort after fracture healing of the ankle. Study selection will follow the Preferred Reporting Items for Systematic Reviews and Meta-Analysis guidelines. We will make a predefined search strategy and use it in several databases. We will include both randomised controlled trials (RCTs) and non-RCT studies. We will use descriptive statistics to summarise the studies collected. If more than one RCT is collected then a meta-analysis will be conducted. The quality of evidence will be assessed using Grading of Recommendations Assessment, Development and Evaluation guidelines.ETHICS AND DISSEMINATIONNo ethics approval is required as no primary data will be collected. Once complete, the results will be made available by peer-reviewed publication.TRIAL REGISTRATION NUMBERPROSPERO registration number CRD42016039186.

The accuracy of emergency physician performed ultrasonography as a diagnostic tool for lateral malleolar fracture.

Author(s): Ozturk, Pinar; Aksay, Ersin; Oray, Nese Colak; Bayram, Basak; Basci, Onur; Tokgoz, Duygu

Source: The American journal of emergency medicine; Aug 2017

Publication Type(s): Journal Article

Abstract:OBJECTIVEMany studies in the literature related to the investigation of the sensitivity and specificity of ultrasound examinations in lateral malleolar fractures is limited. The aim of this study is to investigate the sensitivity and specificity of ultrasound examinations performed by emergency physicians in fractures who are presented to the emergency department with blunt lateral malleolar trauma.METHODPatients over 18years of age who were admitted to the ED with lateral malleolar tenderness were enrolled to this study with convenience sampling. Ultrasonographic examination was performed by emergency physicians. Following the ultrasound examination, a two-sided X-ray was performed. In the case of inconsistency between the US exam and the X-ray evaluated by the emergency physician, a CT was performed on the patients. The X-ray or CT imaging evaluation of an orthopedic surgeon was accepted as the gold standard.RESULTSA hundred-twenty patients were included in the study. Fractures in the lateral malleolus were detected in 47 patients. The sensitivity of X-ray in the diagnosis of lateral malleolar fractures was 92.8%, (95% CI, 79.4-98.1) and the specificity was 100% (95% CI, 89.5-100), while the sensitivity of US exam was 100% (95% CI, 94.1-100), and the specificity was 93% (95% CI, 85-97.6). X-ray gave false negative results in 3 patients, whereas US gave false positive results in 5 patients.CONCLUSIONIn patients admitted to ED with lateral malleolus tenderness, the sensitivity of the ultrasound examination performed by emergency physicians regarding diagnosis of lateral malleolar fracture is higher than X-ray.

Tracking Cumulative Radiation Exposure in Orthopaedic Surgeons and Residents: What Dose Are We Getting?

Author(s): Gausden, Elizabeth B; Christ, Alexander B; Zeldin, Roseann; Lane, Joseph M; McCarthy, Moira M

Source: The Journal of bone and joint surgery. American volume; Aug 2017; vol. 99 (no. 15); p. 1324-1329

Publication Type(s): Journal Article

PubMedID: 28763418

Available in full text at Journal of Bone and Joint Surgery - American Volume - from Ovid

Abstract:BACKGROUNDThe purpose of this study was to determine the amount of cumulative radiation exposure received by orthopaedic surgeons and residents in various subspecialties. We obtained dosimeter measures over 12 months on 24 residents and 16 attending surgeons.METHODSMonthly radiation exposure was measured over a 12-month period for 24 orthopaedic residents and 16 orthopaedic attending surgeons. The participants wore a Landauer Luxel dosimeter on the breast pocket of their lead apron. The dosimeters were exchanged every rotation (5 to 7 weeks) for the resident participants and every month for the attending surgeon participants. Radiation exposure was compared by orthopaedic subspecialty, level of training, and type of fluoroscopy used (regular C-arm compared with mini C-arm).RESULTSOrthopaedic residents participating in this study received monthly mean radiation exposures of 0.2 to 79 mrem/month, lower than the dose limits of 5,000 mrem/year recommended by the United States Nuclear Regulatory Commission (U.S. NRC). Senior residents rotating on trauma were exposed to the highest monthly radiation (79 mrem/month [range, 15 to 243 mrem/month]) compared with all other specialty rotations ($p < 0.001$). Similarly, attending orthopaedic surgeons who specialize in trauma or deformity surgery received the highest radiation exposure of their peers, and the mean exposure was 53 mrem/month (range, 0 to 355 mrem/month).CONCLUSIONSResidents and attending

surgeons performing trauma or deformity surgical procedures are exposed to significantly higher doses of radiation compared with all other subspecialties within orthopaedic surgery, but the doses are still within the recommended limits.CLINICAL RELEVANCEThe use of ionizing radiation in the operating room has become an indispensable part of orthopaedic surgery. Although all surgeons in our study received lower than the yearly recommended dose limit, it is important to be aware of how much radiation we are exposed to as surgeons and to take measures to further limit that exposure.

The impact of helipad designation on meeting the best practice tariff for fractured neck of femur cases in a major trauma centre.

Author(s): Dabis, John; Hussein, Aliyah; Rickman, Mark

Source: The surgeon : journal of the Royal Colleges of Surgeons of Edinburgh and Ireland; Aug 2017; vol. 15 (no. 4); p. 202-205

Publication Type(s): Journal Article

Abstract: Hip fractures represent a significant burden to the NHS: the cost for all UK hip fractures is approximately £2 billion and in 2013, 64 838 people were admitted to hospital with a fractured neck of femur (FNOF). In April 2010 St George's NHS Hospital was designated one of four Major Trauma Centres (MTC) in London. Following MTC designation, in April 2014 St George's Hospital opened a helipad. This study aimed to assess the impact of the helipad designation on the Trust's ability to meet the Best Practice Tariff (BPT) criteria for FNOF patients. Two samples were analysed: 'pre-helipad' (from October 2013 to March 2014) during which 125 patients presented with FNOF, and 'post-helipad' (from April 2014 to September 2014) during which 122 patients presented with FNOF. The percentage of cases receiving surgery within 36 h, receiving joint care of a consultant geriatrician and a consultant orthopaedic surgeon, and receiving assessment by a geriatrician in the perioperative period were found not to have been negatively impacted by the helipad. However, completion of routine recommended assessments including admission using the agreed assessment protocol (96.6% vs. 50%, $p < 0.05$) and completion of two Abbreviated Mental Test (AMT) scores (74.7% vs. 58%, $p = 0.007$) were found to have been compromised.

Stress fractures of the foot and ankle.

Author(s): Welck, M J; Hayes, T; Pastides, P; Khan, W; Rudge, B

Source: Injury; Aug 2017; vol. 48 (no. 8); p. 1722-1726

Publication Type(s): Journal Article Review

Abstract: Stress fractures occur as a result of microscopic injuries sustained when bone is subjected to repeated submaximal stresses. Overtime, with repeated cycles of loading, accumulation of such injuries can lead to macro-structural failure and frank fracture. There are numerous stress fractures about the foot and ankle of which a trauma and orthopaedic surgeon should be aware. These include: metatarsal, tibia, calcaneus, navicular, fibula, talus, medial malleolus, sesamoid, cuneiform and cuboid. Awareness of these fractures is important as the diagnosis is frequently missed and appropriate treatment delayed. Late identification can be associated with protracted pain and disability, and may predispose to non-union and therefore necessitate operative intervention. This article outlines the epidemiology and risk factors, aetiology, presentation and management of the range of stress fractures in the foot and ankle.

A six-year retrospective analysis of cut-out risk predictors in cephalomedullary nailing for pertrochanteric fractures: Can the tip-apex distance (TAD) still be considered the best parameter?

Author(s): Caruso, G; Bonomo, M; Valpiani, G; Salvatori, G; Gildone, A; Lorusso, V; Massari, L

Source: Bone & joint research; Aug 2017; vol. 6 (no. 8); p. 481-488

Publication Type(s): Journal Article

Available in full text at Bone and Joint Research - from Highwire Press

Abstract:OBJECTIVESIntramedullary fixation is considered the most stable treatment for pertrochanteric fractures of the proximal femur and cut-out is one of the most frequent mechanical complications. In order to determine the role of clinical variables and radiological parameters in predicting the risk of this complication, we analysed the data pertaining to a group of patients recruited over the course of six years.METHODSA total of 571 patients were included in this study, which analysed the incidence of cut-out in relation to several clinical variables: age; gender; the AO Foundation and Orthopaedic Trauma Association classification system (AO/OTA); type of nail; cervical-diaphyseal angle; surgical wait times; anti-osteoporotic medication; complete post-operative weight bearing; and radiological parameters (namely the lag-screw position with respect to the femoral head, the Cleveland system, the tip-apex distance (TAD), and the calcar-referenced tip-apex distance (CalTAD)).RESULTSThe incidence of cut-out across the sample was 5.6%, with a higher incidence in female patients. A significantly higher risk of this complication was correlated with lag-screw tip positioning in the upper part of the femoral head in the anteroposterior radiological view, posterior in the latero-lateral radiological view, and in the Cleveland peripheral zones. The tip-apex distance and the calcar-referenced tip-apex distance were found to be highly significant predictors of the risk of cut-out at cut-offs of 30.7 mm and 37.3 mm, respectively, but the former appeared more reliable than the latter in predicting the occurrence of this complication.CONCLUSIONThe tip-apex distance remains the most accurate predictor of cut-out, which is significantly greater above a cut-off of 30.7 mm.Cite this article: G. Caruso, M. Bonomo, G. Valpiani, G. Salvatori, A. Gildone, V. Lorusso, L. Massari. A six-year retrospective analysis of cut-out risk predictors in cephalomedullary nailing for pertrochanteric fractures: Can the tip-apex distance (TAD) still be considered the best parameter?. Bone Joint Res 2017;6:481-488. DOI: 10.1302/2046-3758.68.BJR-2016-0299.R1.

Development of a multidisciplinary quality improvement bundle to improve perioperative care in the management of neck of femur fractures at a district general hospital

Author(s): Eshelby S.; Saxena S.; Oliver M.; Bower G.

Source: Anaesthesia; Jul 2017; vol. 72 ; p. 35

Publication Type(s): Conference Abstract

Abstract: Hip fractures (NOFs) continue to pose a key challenge to healthcare. They remain the most common reason for the elderly population to need emergency surgery, costing the NHS over 1 billion per year [1]. A prospective audit in 2015 at Croydon University Hospital observed suboptimal practice with a protracted time to surgery of 63% (national average 86%). With the introduction of a multidisciplinary quality improvement bundle, the aim of this study was to demonstrate service improvement. Methods An improvement bundle for hip fractures was introduced and included: * Early assessment and clear referral pathway * Anaesthetic review within 6 h to aid optimisation * Raising awareness of the trauma coordinator post * Education on the importance of documenting pain scores * Training and performance on nerve block administration * Monthly clinical governance highlighting a 'process of the month' and relaying feedback of current care * Designated 'NOF notice board' outside the trauma theatre displaying current targets Prospective data were then collected over a 6-month period in 2016. The main outcomes of interest in line with NICE, the National Hip Fracture Database and Best Practice Tariffs were: 1 Admitted using an assessment protocol agreed

by geriatric medicine, orthopaedic surgery and anaesthetics 2 Time to surgery to be within 36 h - target 85% 3 The consideration of nerve blocks for peri-operative pain - target 45% [2] Results Since the quality improvement changes were introduced, 120 NOF patients have been treated at Croydon University Hospital and adherence to the referral pathway has been high. Time from diagnosis to surgery at 36 h is now 81%. Use of nerve blocks for peri-operative pain has improved to 86% (national average 46%) and documentation of peri-operative pain scores has improved. The study has also highlighted key areas requiring further potential improvement including senior clinician presence in theatre and initial assessment of pain on admission, both now being addressed, as well as a business case being written for the trauma coordinator post. (Table presented) Discussion By adopting a standardised, protocol-driven approach to referrals and peri-operative management of NOFs we are developing a culture of continuous improvement and awareness. This has made significant improvements in our peri-operative management of patient presenting with NOFs.

Low trauma fractures and osteoporosis n Men: Early onset owing to sedentary life style

Author(s): Abbas S.S.; Naqvi S.A.; Baig S.; Khan A.N.; Sattar S.

Source: Medical Forum Monthly; Jul 2017; vol. 28 (no. 7); p. 44-47

Publication Type(s): Article

Abstract: Objective: This study was designed for men to evaluate the role of daily physical activity and its association with osteoporosis and fractures in men. Study Design: Cross-sectional / prospective study Place and Duration of Study: This study was conducted at the Pathology Department, Ziauddin University, Karachi from February to November 2014. Materials and Methods: Around 1000 subjects were selected through free orthopedic camps set up in different areas of Karachi during the year 2014. After an informed signed consent demographic data including dietary habits, lifestyle and medical history including overall low-trauma fractures was recorded through interviewer administered Performa and BMD assessed by heel scan device. Results: Out of 1000 subjects (age 44.4+/-9.8 years), 113 (11.3%) had Osteoporosis. In 344 who had low physical activity 89 (26%) had osteoporosis compared to only 24 (3.6%) out of 656 (65.6%) physically active participants. Low trauma fractures were present in 155 (15.5%) participants including 110(71%) in non active (68(44%) upper and 42(27%) lower extremities fractures. In 45(29%) participants with active life style, 30(19%) had upper and 15(10%) lower extremities fracture. Out of 110 low trauma fracture patients 41(37%) were osteoporotic whereas, only 8(13%) of active participants were osteoporotic. Upper extremity fractures 98(63%) were more common compared to lower extremity 57(37%). Conclusion: Low daily activity may be the highest risk factor for osteoporosis and low trauma fractures at younger age in Pakistanis belonging to lower socioeconomic group.

Autologous minced muscle grafts improve endogenous fracture healing and muscle strength after musculoskeletal trauma

Author(s): Hurtgen B.J.; Ward C.L.; Leopold Wager C.M.; Garg K.; Goldman S.M.; Henderson B.E.P.; Greising S.M.; Wenke J.C.; Corona B.T.; McKinley T.O.

Source: Physiological Reports; Jul 2017; vol. 5 (no. 14)

Publication Type(s): Article

Available in full text at Physiological Reports - from Highwire Press

Abstract: The deleterious impact of concomitant muscle injury on fracture healing and limb function is commonly considered part of the natural sequela of orthopedic trauma. Recent reports suggest that heightened inflammation in the surrounding traumatized musculature is a primary determinant of fracture healing. Relatedly, there are emerging potential therapeutic approaches for severe muscle trauma (e.g., volumetric muscle loss [VML] injury), such as autologous minced muscle grafts (1 mm3 pieces of muscle; GRAFT), that can partially prevent chronic functional deficits and appear to

have an immunomodulatory effect within VML injured muscle. The primary goal of this study was to determine if repair of VML injury with GRAFT rescues impaired fracture healing and improves the strength of the traumatized muscle in a male Lewis rat model of tibia open fracture. The most salient findings of the study were: (1) tibialis anterior (TA) muscle repair with GRAFT improved endogenous healing of fractured tibia and improved the functional outcome of muscle regeneration; (2) GRAFT repair attenuated the monocyte/macrophage (CD45+CDllb+) and T lymphocyte (CD3+) response to VML injury; (3) TA muscle protein concentrations of MCP1, IL-10, and IGF-1 were augmented in a proregenerative manner by GRAFT repair; (4) VML injury concomitant with osteotomy induced a heightened systemic presence of alarmins (e.g., soluble RAGE) and leukocytes (e.g., monocytes), and depressed IGF-1 concentration, which GRAFT repair ameliorated. Collectively, these data indicate that repair of VML injury with a regenerative therapy can modulate the inflammatory and regenerative phenotype of the treated muscle and in association improve musculoskeletal healing.

First in the Nation: One Unit's Journey to Achieving Fragility Fracture Certification

Author(s): McDonald A.; Church S.; Hixon L.; Vo L.; Sleutel M.

Source: Orthopedic nursing; Jul 2017; vol. 36 (no. 4); p. 251-256

Publication Date: Jul 2017

Publication Type(s): Article

Abstract: Osteoporosis is related to more than 2 million fractures and $19 billion in healthcare costs each year (). A fragility fracture (FF) is a low-energy fracture of the distal radius, proximal humerus, ankle, or proximal femur (hip) from minimal trauma such as a fall from a standing height. In addition to cost, FFs often result in the loss of independence and productivity (). In 2015, our orthopaedic unit received the first certification ever awarded for FFs. Fragility fracture certification is a new certification demonstrating that a healthcare facility complies with national patient care standards and uses evidence-based practice guidelines to deliver quality outcomes. Orthopaedic nurses have a critical role in optimizing future bone health and fracture prevention. Our story describes the process and challenges faced becoming the first organization in the nation to be successfully surveyed for The Joint Commission's Fragility Fracture Certification.

Evaluation of the geriatric co-management for patients with fragility fractures of the proximal femur (Geriatric Fracture Centre (GFC) concept): Protocol for a prospective multicentre cohort study

Author(s): Joeris A.; Hurtado-Chong A.; Hess D.; Kalampoki V.; Blauth M.

Source: BMJ Open; Jul 2017; vol. 7 (no. 7)

Publication Type(s): Article

Available in full text at BMJ Open - from ProQuest

Abstract: Introduction Treatment of fractures in the elderly population is a clinical challenge due partly to the presence of comorbidities. In a Geriatric Fracture Centre (GFC), patients are co-managed by a geriatrician in an attempt to improve clinical outcomes and reduce morbidity and mortality. Until now the beneficial effect of orthogeriatric co-management has not been definitively proven. The primary objective of this study is to determine the effect of GFC on predefined major adverse events related to a hip fracture compared to usual care centres (UCC). The secondary objectives include assessments in quality of life, patient-reported outcomes and cost-effectiveness. Methods and analysis Two hundred and sixty-six elderly patients diagnosedwith hip fracture and planned to be treated with osteosynthesis or endoprosthesis in either a GFC or UCC study site will be

recruited, 133 per type of centre. All procedures and management will be done according to the site's standard of care. Study-related visits will be performed at the following time points: preoperative, intraoperative, discharge from the orthopaedic/trauma department, discharge to definite residential status, 12 weeks and 12 months postsurgery. Data collected include demographics, residential status, adverse events, patient-reported outcomes, fall history, costs and resources related to treatment. The risk of major adverse events at 12 months will be calculated for each centre type; patient-reported outcomes will be analysed by mixed effects regression models to estimate differences in mean scores between baseline and follow-ups whereas cost-effectiveness will be assessed using the incremental cost-effectiveness ratio. Ethics and dissemination Ethics approval for this study was granted from the local Ethics Committees or Institutional Review Board from each of the participating sites prior to patient enrolment. The results of this study will be published in peer-reviewed journals and presented at different conferences.

Can real-time RGBD enhance intraoperative Cone-Beam CT?

Author(s): Fotouhi J.; Fuerst B.; Navab N.; Wein W.

Source: International Journal of Computer Assisted Radiology and Surgery; Jul 2017; vol. 12 (no. 7); p. 1211-1219

Publication Type(s): Article

Abstract: Purpose: Cone-Beam Computed Tomography (CBCT) is an important 3D imaging technology for orthopedic, trauma, radiotherapy guidance, angiography, and dental applications. The major limitation of CBCT is the poor image quality due to scattered radiation, truncation, and patient movement. In this work, we propose to incorporate information from a co-registered Red-Green-Blue-Depth (RGBD) sensor attached near the detector plane of the C-arm to improve the reconstruction quality, as well as correcting for undesired rigid patient movement. Methods: Calibration of the RGBD and C-arm imaging devices is performed in two steps: (i) calibration of the RGBD sensor and the X-ray source using a multimodal checkerboard pattern, and (ii) calibration of the RGBD surface reconstruction to the CBCT volume. The patient surface is acquired during the CBCT scan and then used as prior information for the reconstruction using Maximum-Likelihood Expectation-Maximization. An RGBD-based simultaneous localization and mapping method is utilized to estimate the rigid patient movement during scanning. Results: Performance is quantified and demonstrated using artificial data and bone phantoms with and without metal implants. Finally, we present movement-corrected CBCT reconstructions based on RGBD data on an animal specimen, where the average voxel intensity difference reduces from 0.157 without correction to 0.022 with correction. Conclusion: This work investigated the advantages of a C-arm X-ray imaging system used with an attached RGBD sensor. The experiments show the benefits of the opto/X-ray imaging system in: (i) improving the quality of reconstruction by incorporating the surface information of the patient, reducing the streak artifacts as well as the number of required projections, and (ii) recovering the scanning trajectory for the reconstruction in the presence of undesired patient rigid movement.

Outcomes of the Ilizarov frame use in elderly patients

Author(s): Iliopoulos E.; Morrissey N.; Cho S.; Khaleel A.

Source: Journal of Orthopaedic Science; Jul 2017; vol. 22 (no. 4); p. 783-786

Publication Type(s): Article

Abstract: Aim The use of circular frame is widely accepted. This is an outcome review on use of circular Ilizarov frame in elderly patients. Materials & methods Data from all patients treated with an

Ilizarov circular frame between January 2002 and December 2014, who were 65 years of age or over at surgery was collected. Seventy Ilizarov circular frames were applied during this period in our unit at a mean age of 71.2 years. Clinical, radiological and quality of life questionnaire (SF-12) data were gathered. Mortality, complication and revision data were also collected. Results Indications of application of Ilizarov frame were fractures (53%), non-unions (19%), deformity correction (7%) and ankle fusions (21%). Mean period of time in the frame was 184.4 +/- 84.2 days. Mortality and complication rates were low (5-7%) at a mean follow-up 4.2 years. There was no case of septic arthritis or newly induced deep infection. Physical and Mental components of SF-12 questionnaire returned to normal for that age group. There was no difference between the subgroups (tibia plateau fractures, pilon fractures, ankle fusions, non-unions, deformity correction and miscellaneous trauma) concerning the physical and mental subjective (PCS and MCS SF-12 component) outcomes ($p > 0.05$). Conclusions Ilizarov circular frame as a definitive treatment of many kinds of trauma and orthopaedic conditions can be safely and reliably used in the elderly with good quality of life results.

How Knowledge Relates to Confidence in Orthopedics and Emergency Medicine Regarding Return to Sport and Rehabilitation in Foot and Ankle Trauma

Author(s): Johnson-Lynn S.; Townshend D.

Source: Journal of Surgical Education; Jul 2017; vol. 74 (no. 4); p. 748-753

Publication Type(s): Article

Abstract: Objective The aim of this study was to survey the knowledge of registrars in emergency medicine and orthopedics on 5 common injuries to the foot and ankle and compare this knowledge, and self-reported confidence in giving it, with that of consultants and physiotherapists of various levels of experience. Design An online survey was used to gather the information using scenario-based open and closed questions. Participants A total of 102 health care professionals, who regularly deal with sports injuries, were recruited. These included consultant orthopedic surgeons with a subspecialty interest in foot and ankle surgery, orthopedic surgeons in other specialties, extended scope physiotherapy practitioners (ESPs) in foot and ankle and general musculoskeletal practice, emergency medicine consultants, emergency medicine registrars, orthopedic registrars, senior physiotherapists, and junior physiotherapists. Setting The participants were drawn from various health care institutions in the North East of England. Results Consultant foot and ankle surgeons and extended scope practitioners in foot and ankle both scored significantly on knowledge of rehabilitation program design than either set of registrars. For 2 of the case scenarios, there was a significant difference in scores between either orthopedic consultants or ESPs and registrars (p

A retrospective cohort study of concomitant ipsilateral extra-capsular and intra-capsular fractures of the proximal femur. Are they casual findings or an undervalued reality?

Author(s): Videla-Ces M.; Sales-Perez J.-M.; Giros-Torres J.; Sanchez-Naves R.; Videla S.

Source: Injury; Jul 2017; vol. 48 (no. 7); p. 1558-1564

Publication Type(s): Article

Abstract: Background Fractures of the proximal femur constitute a major public health problem, with an annual incidence in Spain of 7.6 cases per 1000 inhabitants over 65 years of age. Hip fractures are frequent in elderly patients, related to osteoporosis and with low energy trauma, which means that they can be considered a geriatric syndrome. Simultaneous ipsilateral extra- and intra-articular hip fractures are considered as very rare are, and generally speaking, classified as extra- or intra-capsular fractures. Moreover, there is no consensus with regard to treatment of these concomitant fractures. Aim To estimate the incidence of concomitant ipsilateral extra- and intra-capsular

fractures of the proximal femur, and to describe the diagnostic process and the clinical characteristics of these concomitant fractures. Patients and methods Retrospective cohort study of patients with hip fractures. The incidence of combined extra- and intra-capsular fractures was estimated, a confidence interval of 95% (95%CI) was calculated and a descriptive analysis was drawn up. Results Between May 2010 (the date on which the Orthopaedic and Trauma Surgery Department of our new Hospital began the surgical activity) and December 2016, 33 (median age, 86 years-old) of the 2625 hip fractures were classified as simultaneous extra- and intra-capsular ipsilateral fractures. The overall cumulative incidence was of 1.3% (95%CI:0.9-1.8%). In 32 (97%) of the patients, the fracture was a consequence of a low energy trauma (ground level fall), while the remainder was due to a medium energy trauma (skating). In all cases the two fracture lines seem to be independent of each other, which suggests different mechanisms of injury from that of isolated subcapital or intrertrochanteric fracture. Conclusion The incidence of concomitant ipsilateral extra- and intra-capsular fractures of the proximal femur must be taken into account in patients over 65 years of age. It is clinically relevant to identify these concomitant fractures in order to arrive at a correct diagnosis, which will facilitate preoperative planning and the choice of the best treatment to achieve a better outcome. Misdiagnosis may cause further problems, such as fixation failures, disability and, in a worst case scenario, an increased risk of death. Therefore, a good and complete preoperative study is important, along with both good quality X-ray projections and 2D and 3D Ct-Scans in case of doubt.

Type B ankle fractures: a retrospective study of longer-term outcomes.

Author(s): Mittal, Rajat; Jeyaprakash, Prajith; Harris, Ian A; Naylor, Justine M

Source: BMC research notes; Jul 2017; vol. 10 (no. 1); p. 352

Publication Type(s): Journal Article

Available in full text at BMC Research Notes - from BioMed Central

Abstract:OBJECTIVESAnkle fractures are common and can be treated with or without surgery. The aim of the present study was to compare patient reported outcomes between patients who sustained an Orthopaedic Trauma Association type 44-B1 ankle fracture who had either surgical or non-surgical fixation.RESULTSForty-six people were recruited; 38 were treated non-surgically and 8 were treated surgically. Mean follow-up time was 24 and 25 months for surgical and non-surgical groups respectively. Baseline characteristics were similar between the two groups. On unadjusted analysis, there was no significant difference between the two groups with respect to any outcome. After adjusting for age and gender, the surgical group had a significantly lower outcome score with respect to the FAOQ. Surgical management was associated with a significantly lower patient-reported ankle function compared to non-surgical management for the treatment of patients with type 44-B1 ankle fracture after adjusting for age and gender. However, there was no significant difference between the two groups with respect to the general health outcomes or adverse events. Higher-level evidence is required to inform optimal practice for this common fracture.

Quality of life and clinical-radiological long-term results after implant-associated infections in patients with ankle fracture: a retrospective matched-pair study.

Author(s): Ziegler, Patrick; Schlemer, Donat; Flesch, Ingo; Bahrs, Sonja; Stoeckle, Ulrich; Werner, Sebastian; Bahrs, Christian

Source: Journal of orthopaedic surgery and research; Jul 2017; vol. 12 (no. 1); p. 114

Publication Type(s): Journal Article

Available in full text at Journal of Orthopaedic Surgery and Research - from BioMed Central

Abstract:BACKGROUNDAnkle fractures are frequently occurring injuries. Despite the relatively simple operative technique, patients often suffer from postoperative complications. Little is known about postoperative treatment of implant-associated infections of the ankle. Therefore, this study shows and evaluates a treatment algorithm in long- and short-term outcomes compared to infection-free patients.METHODSData from patients of over 20 years of a level 1 trauma center and university hospital was retrospectively analyzed including age, gender, comorbidities, smoking status, fracture classification, number of revisions, length of in-patient stay due to fracture and infection, and results of microbiological specimen with the length of antibiotic treatment. Moreover, present long-term outcome was evaluated by the American Orthopaedic Foot and Ankle Society (AOFAS) hindfoot score, the Ankle Osteoarthritis Score, and the Short Form 36 score and compared to a matched-pair infection-free patient cohort.RESULTSForty-four patients could be retrospectively evaluated (51% male, 49% women, mean age 46 ± 17 years). Most of the cases were Weber B fractures (38%) following an in-patient stay from 51 ± 4.3 days after primary treatment and 77 ± 10.0 days after secondary treatment in our hospital. Microbiological specimen showed in 77% Staphylococcus aureus with following intravenous antibiotic treatment for 13.9 ± 3.1 days in mean. Common comorbidities/risk factors were cardiovascular disease (28%), smoking (15%), and diabetes (18%). Cure of infection and clinical and radiographic osseous consolidation could be documented for all cases. Patients with implant-associated infections had significantly more risk factors than infection-free patients (1.1/0.33; p = .02 per patient). The matched-pair group showed significantly better long-term outcome in mean regarding the Ankle Osteoarthritis Score (2.0 ± 1.2/13.9 ± 4.7) and AOFAS hindfoot score (96.7 ± 1.9/87.3 ± 3.4).CONCLUSIONImmediate revision surgery with aggressive debridement, microbiological diagnostics, antibiotic therapy, and use of a drain until osseous consolidation is reached with following removal of the implant in patients with implant-associated infections after ankle fracture and open reduction internal fixation lead to cure of infection and fair long-term outcome in all cases. Special care must be taken of risk factors like diabetes and smoking.TRIAL REGISTRATION24/2008BO2.

Surgical management of Hawkins type III talar neck fracture through the approach of medial malleolar osteotomy and mini-plate for fixation.

Author(s): Liu, Hui; Chen, Zhida; Zeng, Wenrong; Xiong, Yuanfei; Lin, Yongzhi; Zhong, Huacheng; Wu, Jin

Source: Journal of orthopaedic surgery and research; Jul 2017; vol. 12 (no. 1); p. 111

Publication Type(s): Journal Article

PubMedID: 28705216

Abstract:BACKGROUNDFractures of the talar neck are relatively uncommon yet current interventions suffer from a high incidence of complications and poor functional outcomes. In the present study, we report a surgical treatment of Hawkins type III talar neck fracture through the approach of medial malleolar osteotomy and mini-plate for fixation and discuss the therapeutic effects after long-term follow-up.METHODSFrom January 2010 to January 2015, 21 patients with 22 fractures were treated using this approach within days of sustaining the injury. Clinical and radiographic data were collected during regular post-operative follow-ups. Health-related quality of life factors were evaluated using visual analogue scale (VAS). Functional outcomes were determined according the Hawkins score and the Ankle-Hind foot Scale of the American Orthopedic Foot and Ankle Society (AOFAS). Present of complications such as arthritis, avascular necrosis (AVN), and malunion were evaluated using radiographs and magnetic resonance imaging (MRI). Anatomical parameters of injured and corresponding uninjured talus were measured and compared using digital three-dimensional (3D) computer model.RESULTSThe mean duration of surgery was 65.6 ± 9.7 min. The average blood loss volume of the patients was 29.1 ± 5.7 ml. All the patients except 1 were

followed up 18 to 41 months (average 29.6 months). The average VAS score for these patients was 3.2 ± 1.1, and the mean Hawkins score was 11.4 ± 3.4 at the final follow-up visit. The average AOFAS score was 72.8 ± 17.3. Nine patients outcomes were rated as "excellent", 4 as "good", 4 as "fair," and 4 as "poor". No malunion, screw loosening, plate breakage, or other internal fixation failures were found at final follow-up. Long-term complications included: 1 case of malunion, 5 cases of complete AVN, 8 cases of partial AVN, 13 cases of talocrural arthritis, 14 cases of subtalar arthritis, and 3 cases of talonavicular arthritis. Secondary surgery was performed in 4 cases. The relevant average anatomical data of injured and uninjured talus show no significant difference.CONCLUSIONSThis surgical treatment we used here resulted in decreased soft tissue trauma, adequate exposure of talar neck, satisfactory performance of daily life activities, and quality of life following surgery and restoration of anatomy of injured talus. However, long-term complications such as arthritis and AVN are still commonly seen.

Artificial intelligence for analyzing orthopedic trauma radiographs.

Author(s): Olczak, Jakub; Fahlberg, Niklas; Maki, Atsuto; Razavian, Ali Sharif; Jilert, Anthony; Stark, André; Sköldenberg, Olof; Gordon, Max

Source: Acta orthopaedica; Jul 2017 ; p. 1-6

Publication Type(s): Journal Article

Available in full text at Acta Orthopaedica - from EBSCOhost

Abstract: Background and purpose - Recent advances in artificial intelligence (deep learning) have shown remarkable performance in classifying non-medical images, and the technology is believed to be the next technological revolution. So far it has never been applied in an orthopedic setting, and in this study we sought to determine the feasibility of using deep learning for skeletal radiographs. Methods - We extracted 256,000 wrist, hand, and ankle radiographs from Danderyd's Hospital and identified 4 classes: fracture, laterality, body part, and exam view. We then selected 5 openly available deep learning networks that were adapted for these images. The most accurate network was benchmarked against a gold standard for fractures. We furthermore compared the network's performance with 2 senior orthopedic surgeons who reviewed images at the same resolution as the network. Results - All networks exhibited an accuracy of at least 90% when identifying laterality, body part, and exam view. The final accuracy for fractures was estimated at 83% for the best performing network. The network performed similarly to senior orthopedic surgeons when presented with images at the same resolution as the network. The 2 reviewer Cohen's kappa under these conditions was 0.76. Interpretation - This study supports the use for orthopedic radiographs of artificial intelligence, which can perform at a human level. While current implementation lacks important features that surgeons require, e.g. risk of dislocation, classifications, measurements, and combining multiple exam views, these problems have technical solutions that are waiting to be implemented for orthopedics.

Effect of Lymphedema Treatment for Management of Acute Pilon Fractures.

Author(s): Whatley, John M; Lalonde, James A; Greene, Craig C; Riche, Kevin B; Tatum, Danielle M

Source: Orthopedics; Jul 2017; vol. 40 (no. 4); p. e668

Publication Type(s): Journal Article

Available in full text at Orthopedics - from ProQuest

Abstract: Pilon fractures are high-energy injuries that often result in considerable edema and compromise of the soft tissue envelope of the ankle. These injuries are typically staged with an external fixator until the soft tissue is amenable for definitive fixation. This study was conducted to determine the effects of lymphedema treatment for the management of pilon fractures. Patients

who underwent open reduction and internal fixation of pilon fractures between 2007 and 2014 at the authors' level II trauma center were identified by Current Procedural Terminology codes indicative of placement of an external fixator (20690) and open reduction and internal fixation of a pilon fracture (27826, 27827, or 27828). The primary efficacy endpoint to determine negative outcomes was 90 days after definitive fixation. Eighty-two patients with 84 pilon fractures met inclusion criteria. Forty-eight ankles (57%) received lymphedema treatment. There were no significant differences in population demographics between the control and treatment groups. Median times to internal fixation in the control and treatment groups were 20 days (inter-quartile range, 15.5-30 days) and 11 days (interquartile range, 6-18 days), respectively. This difference was statistically significant (P=.001). Additionally, there was no significant difference in the overall incidence of wound complications between the control and treatment groups (P=.246). Compression wrapping for posttraumatic edema was effective in reducing the time needed for soft tissues to be appropriate for definitive surgical fixation of pilon fractures without increasing the risk of wound complications. These promising results warrant future study. [Orthopedics. 2017; 40(4):e668-e674.].

Bilateral tibial shaft fractures: a multicenter analysis.

Author(s): Cui, Shari; Bauer, Jennifer M.; Mir, Hassan; Cannada, Lisa K.

Source: Current Orthopaedic Practice; Jul 2017; vol. 28 (no. 4); p. 365-370

Publication Type(s): Academic Journal

Abstract: Background: Bilateral tibial shaft fractures represent high-energy trauma. While treatment and complications of bilateral femoral fractures are well defined, there is limited literature on bilateral tibial shaft fractures. We present a multicenter study on bilateral tibial shaft fractures, analyzing the most commonly associated injuries and complications. Methods: A retrospective review was performed to identify all patients with bilateral tibial shaft fractures treated during a 5-year period. Demographics, injury measures, treatments, and complications were collected. Categories were evaluated and ranked based on frequency of occurrence. Results: Approximately 2000 tibial shaft fractures were treated during a 5-year period, of which 68 patients (19 females, 49 males) had sufficient records for inclusion. The average age was 39 yr (range 15-83 yr). There were 80 open fractures in 55 patients. Other musculoskeletal trauma and chest trauma were the two most common associated injuries (followed by face, head, and abdominal trauma). Two patients had definitive casting, 67 patients (129 tibias) were surgically treated, and four patients required amputation on arrival. Fourteen patients developed nonunions, 13 had compartment syndrome, and 34 were affected by nonsurgical complications. Thirty-one patients required subsequent surgery to promote healing. There were six mortalities. Conclusions: We present the largest group of patients with bilateral tibial fractures and show a high rate of open fractures, severe systemic injuries, and frequent complications. Orthopaedic surgeons must balance early surgical treatment with the presence of associated injuries and educate patients regarding complications and the possibility of subsequent surgeries to promote healing of these serious injuries.

IM Nail Fixation of Atypical Femur Fractures with Bone Marrow Aspirate Concentrate Leads to Faster Union: A Case Control Study.

Author(s): Lovy, Andrew J.; Kim, Jun S.; Di Capua, John; Somani, Sulaiman; Shim, Stephanie; Keswani, Aakash; Hasija, Rohit; Yangguan Wu; Joseph, David; Ghillani, Richard; Wu, Yangguan

Source: Journal of Orthopaedic Trauma; Jul 2017; vol. 31 (no. 7); p. 358-362

Publication Type(s): Academic Journal

Abstract: Objectives: High rates of implant failure and nonunion in atypical femur fractures (AFF) have been reported. The aim of this study was to evaluate bone marrow aspirate concentrate (BMAC) use in the treatment of AFF.Design: Retrospective Case Control SETTING:: Level 1 Trauma

Center PATIENTS:: Complete AFF, defined according to American Society of Bone and Mineral Research (ASBMR) criteria, from September 2009 to April 2015 with minimum 1 year follow up.Intervention: Operative treatment with anterograde intramedullary (IM) nails. Beginning June 2014, BMAC from the ipsilateral iliac crest was added to all AFFs.Main Outcome Measurements: Time to union as determined by a blinded panel of 3 Attending Orthopaedic Surgeons, union rates, complications.Results: 35 patients with 36 AFFs were reviewed, of which 33 AFFs were included and 11 received BMAC. Aledronate was the most commonly prescribed bisphosphonate, with a similar mean duration of use in controls and BMAC cases (5.6 vs 6 years, p=0.79). BMAC use significantly decreased time to union (3.5 vs 6.8 months, p=0.004). Varus malreduction was associated with a significant delay in union (9.7 vs 4.7 months, p=0.04). Overall one year union rate was 86.2%, and nonsignificantly higher in BMAC compared to controls (100.0% vs. 77.3%, p=0.11). Multivariate analysis revealed BMAC and varus malreduction as independent predictors of time to union. There were no complications related to BMAC use.Conclusion: Our findings support IM nailing of AFF as an effective treatment option with a low surgical complication rate and highlight the importance of avoiding varus malreduction. BMAC use significantly reduced time to fracture union without an increase in surgical complication rates.Level Of Evidence: Therapeutic Level III. See Instructions for Authors for a complete description of levels of evidence.

Exercise: Relative Risk

The relative risk is the ratio of probability of an event (a specified outcome) occurring in one group (i.e. those exposed to a particular intervention) compared to those in another group (i.e. those not exposed – a control group).

The relative risk can be interpreted using the following chart. First, you must determine whether the event (the outcome measure) is adverse or beneficial.

Relative Risk	Adverse outcome (e.g. death)	Beneficial outcome (e.g. recovery of limb function)
<1	Intervention better than control	Intervention worse than control
1	Intervention no better or worse than control	Intervention no better or worse than control
>1	Intervention worse than control	Intervention better than control

Have a go at interpreting the relative risks for these three studies using the chart above. Is the intervention better or worse than the control?

	Intervention	Population	Outcome measure (think: adverse or beneficial?)	Relative Risk
Study 1	Drug X	Adults at risk of a heart attack	Heart attack	1.2
Study 2	Therapy programme Y	Smokers	Smoking cessation	0.8
Study 3	Probiotic Z	Children on antibiotics	Diarrhoea	0.3

*Find out more about relative risk in one of our **Statistics** training sessions.*
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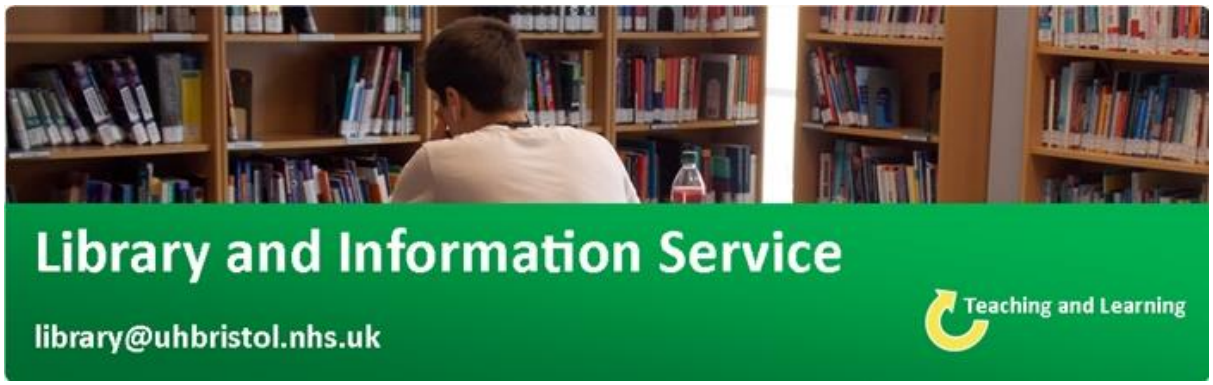
Answers: Study 1: worse; Study 2: worse; Study 3: better



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