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Scientific Abstracts

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Name

Vera Toh

Title

Elbow flexion reconstruction for avulsion brachial plexus injury: A study of intercostal nerve transfer and partial distal nerve transfer

Purpose

This study evaluates the results of elbow flexion reconstruction for patients with avulsion brachial plexus injury (BPI) who underwent intercostal nerve (ICN) transfers or partial distal nerve (PDN) transfers.

Method

32 of 41 patients who underwent ICN or PDN transfer for elbow flexion reconstruction were included in this study. ICN transfer involved coaptation of 3rd, 4th, 5th ICN to the musculocutaneous nerve, while PDN transfer involved coaptation of a fascicle of the ulnar or median nerve to nerve to biceps or brachialis muscle respectively. Patients were assessed for recovery of elbow flexion power to M3 and above at regular intervals and finally at 2 years.

Results

25 patients (mean age=27.9 years) underwent ICN transfer while 7 patients underwent PDN transfer (mean age = 21.7 years). Surgery was performed within the interval of 1-6 months post-injury. The success rate of attaining M3 elbow flexion by 2 years was 60% and 100% respectively. Though the mean time to attain M3 elbow flexion was 15 months in the ICN group and 11.6 months in the PDN group, this was not statistically significant. The mean time to M4 elbow flexion was different i.e. 24.5 months in the ICN group and 11 months in the PDN group ($p=0.039$). The mean MRC grade at 2 years was higher in the PDN group (M4.0 compared to M2.5 in ICN group) ($p=0.003$).

Conclusion

PDN transfer for elbow flexion in avulsion BPIs has a more predictable and better outcome than ICN transfer. However, in total avulsion BPI, ICN transfer is a good option.

Name

Sarah Huan

Title

Predictors of Galeazzi fracture-dislocations and associated DRUJ instability in radial shaft fractures

Purpose

In Galeazzi fractures, there are reports of fracture patterns and locations predicting associated injury to the distal radio-ulnar joint (DRUJ). However, the management of DRUJ dislocation following open reduction and internal fixation (ORIF) of the radius is still evolving. This study identifies the risk factors of Galeazzi fractures and DRUJ instability. We examine and recommend treatment methods for associated DRUJ instability.

Method

101 cases of radius shaft fractures were treated by ORIF. Out of these, 60 sustained Galeazzi fracture-dislocations while 41 sustained isolated fractures of the radial shaft. A retrospective study was conducted to analyze the radiographic indicators for risk of Galeazzi fractures and associated DRUJ instability, as well as evaluate the outcome of open and closed treatment of DRUJ instability.

Results

Significant risk factors for a Galeazzi fracture are a fracture in the distal third of the radius and an ulnar inclination of $>30^\circ$. Nonetheless, these do not predict associated DRUJ instability, which may be predicted by an ulnar variance of $>8\text{mm}$, in contrast to that of 2mm reported by Takemoto et al. There was also no significant difference in outcome between the different methods of treatment and immobilisation.

Conclusion

In radius shaft fractures involving the distal third or ulnar inclination of $>30^\circ$, the possibility of Galeazzi fracture-dislocations should be considered. Though ulnar variance of $>8\text{mm}$ was a predictor of associated DRUJ instability, the final assessment is best done by an intra-operative ballottement test. We recommend open repair and external splinting for DRUJ instability.

Name

Benjamin Ding

Title

Radial Shaft Fracture Obliquity Is a Predictor of Distal Radioulnar Joint Instability

Purpose

We assessed the utility of using radial shaft fracture obliquity measurements on radiographs as a predictor of distal radio-ulnar joint (DRUJ) instability. We also clinically validated previously described predictors of DRUJ instability which included fracture line within 7.5cm of the lunate fossa, radial shortening >5mm and ulna styloid fracture.

Method

We retrospectively analyzed the radiographs of all surgically managed patients in our unit with radial shaft fractures from 2006 to 2016. The degree of obliquity was analyzed on the basis of the maximum fracture-line angle in either the coronal or the sagittal plane. Patient demographics, mechanism of injury and other radiological parameters were also analyzed.

Results

A radial shaft fracture obliquity >30 degrees is associated with DRUJ instability, $p=0.001$. Radial fracture shaft obliquity >30° was the most sensitive radiological parameter for predicting DRUJ instability, 76.1%. Previously described radiological parameters were found to be clinically significant for predicting DRUJ instability but were of moderate sensitivity.

Conclusion

Oblique radial shaft fractures appear to be associated with increased incidence of DRUJ instability. This new radiologic parameter may be used in combination with pre-existing parameters in predicting DRUJ instability prior to surgery.

Name

Mala Satku

Title

The transverse single-incision approach to the distal radius

Purpose

Minimally- invasive distal radius fracture fixation has been shown to have similar functional outcomes and potential aesthetic benefits as compared to the traditional Henry approach. We describe an alternative approach to the distal radius that leaves a transverse scar which is well hidden in the wrist crease.

Method

The surgical approach to the distal radius is described. A transverse incision is used which leaves a scar hidden in the proximal wrist crease. Post-operatively, patients underwent a standard rehabilitation program. Patient demographics and fracture classification are also collected. We compare these results with the results of the traditional longitudinal approach found in literature.

Results

A 1-year follow up of the first five patients that had this surgery is presented. All surgeries were performed by the same surgeon. All patients had union of the fracture and no long-term complications. All the patients were able to return to their pre-injury work.

Conclusion

The transverse approach to the distal radius using a single incision is a viable alternative to the traditional longitudinal approach to the distal radius. The approach has the advantage of having the surgical scar hidden within the proximal wrist crease and does not have any functional disadvantage compared with the traditional approach.

Name

Renita Sirisena

Title

Non-tumescent wide awake anesthesia

Purpose

Wide awake anesthesia utilizes tumescent infiltration of diluted adrenaline to physically and chemically effect hemostasis on the surgical field. Although effective, tumescent infiltration distends the subcutaneous plane and obscure finer anatomical details. We propose the utility of low volume and higher concentration infiltration (1.8ml Lignocaine 2%, adrenaline 1:80,000 per 1cm² surgical field) to achieve hemostasis without subcutaneous edema. The efficacy of this approach was prospectively evaluated in 25 cases of trigger release performed by a single operator.

Method

Surgical charts of 25 patients who underwent trigger release by the senior author was evaluated for volume of infiltration, time from infiltration to surgery, and quality of hemostasis. Surgical complications, if any, were recorded.

Results

The mean volume of infiltration was 2.06 ± 0.54 ml while the time elapsed between infiltration and incision was 3.80 ± 2.94 minutes. There was no peri-operative bleeding, tourniquet inflation, or ischemic events noted.

Conclusion

A lower volume of higher concentration infiltration achieves the same level of hemostasis as conventional tumescent technique. Anesthesia onset time was considerable shorter than reported figures.

Name

Amaris Lim

Title

Anatomical Considerations for Endoscopic Carpal Tunnel Release in Distal Radius Fractures

Purpose

Distal radius fractures may distort carpal tunnel anatomy, and are a relative contraindication to endoscopic carpal tunnel release (eCTR). This study aims to evaluate the anatomical considerations of eCTR in patients with previous distal radius fractures, and compare the use of open release (OCTR) and eCTR in these patients.

Method

This is a retrospective study conducted in a tertiary hospital in Singapore between May 2008 and February 2016. This study included all patients aged above 16, with a history of distal radius fractures, who underwent CTR. Parameters studied include patient biodata, risk factors for CTS, AO classification, treatment of the fractures, and CTR outcome. Statistical analysis was conducted using the chi-squared test.

Results

Among 1123 patients who underwent CTR, 41 had a history of ipsilateral distal radius fracture. Of these, 68.3% underwent OCTR, and 31.7% underwent eCTR. The eCTR patients most commonly had AO Type A fractures (61.5%), while the OCTR patients most commonly had Type C fractures (46.2%). 61.5% of the eCTR patients had their fractures treated conservatively, while 74.1% of the OCTR patients had undergone open reduction and internal fixation (ORIF). The mean radiological parameters of the eCTR patients post-fracture-healing were as follows: volar tilt -2.6° , radial height 8.49mm, radial inclination 17.2° , and ulnar variance -0.28mm . The post-operative results of both the eCTR and OCTR patients were comparable. All patients experienced improvement in CTS symptoms at final follow-up.

Conclusion

We recommend that eCTR can be used in the treatment of patients with previous distal radius fractures who now present with CTS.

Name

Raymar Sibonga

Title

OUTCOMES OF SURGICALLY TREATED SCAPHOID FRACTURES

Purpose

Present the outcomes of surgically treated scaphoid fractures from our local population.

Method

Retrospective study on all patients who underwent surgical treatment for scaphoid fractures at our hospital over a 4-year period. A review of clinical and radiographic data was undertaken. Statistical data were reported in mean, range and percentage.

Results

Fifty six scaphoid fractures in 55 men and one women were included in the study. The mean age is 26 years (range: 19-49).The dominant hand was involved in 24 patients (42.8%). The fractures involved the waist in 44 patients (78.6%), proximal pole in 11 patients (19.6%), and distal pole in 1 patient (1.8%). The mean time elapsed to surgery was 174 days (range: 1-990). The surgical approach was dorsal in 31 patients (55%) and volar in 25 patients (45%). Thirty- five patients (58.3%) required bone grafting. A cannulated headless compression screw (HCS) was used for fixation in 53 patients (96%) and a HCS screw with K-wire was used in 3 patients (4%).The average follow-up period was 10 months (range: 1-54).

Fifty scaphoid fractures (89.2%), showed evidence of union at mean of 172 days (range: 30-690). Six patients with scaphoid fractures that went into non-union underwent surgery more than 120 days (mean: 315; range: 120- 540) from the time of injury, this included 4 waist and 2 proximal pole fractures.

Conclusion

The time from injury to surgical fixation of scaphoid fractures is the single most important factor that leads to scaphoid fracture union. Site of scaphoid fracture only influences the time to union.

Name

Ruth Tan

Title

Outcome of conservatively managed mallet fractures

Purpose

Relative surgical indications for closed mallet fractures include fracture fragment exceeding 30 percent of distal phalanx base and/or distal interphalangeal joint (DIPJ) subluxation. In a prospective cohort study of splinting of 25 patients who had fractures involving 25 to 75 percent of joint surface, we aimed to elucidate the factors that affect their clinical outcome.

Method

47 patients received treatment for mallet fractures from 2014 to 2016. After excluding 16 patients who had surgical treatment, 6 loss to follow-up, 25 patients were available for analysis. All patients were assessed by a single operator and underwent similar splint regimen (6 weeks immobilization, followed by 6 weeks of mobilization). Active range of motion (AROM) and presence of swan neck deformity were noted at the end of treatment duration. Outcome was classified with the Crawford criteria. Analysis of variance (fracture size, DIPJ subluxation, time elapsed from injury to treatment, and age) was performed.

Results

Patients had mean age of 29.8, time from injury of 17.5 days, and duration of follow-up of 3.2 months. 68(n=17) percent of patients had fracture size of 50 percent or more. 48(n=12), 16(n=4) and 36(n=9) percent of patients achieved excellent, good and fair outcomes respectively according to the Crawford classification.

A significant relationship was found between age below 30 and a favorable Crawford classification. No significance was found with fracture size, DIPJ subluxation, and time from injury. None of the factors analyzed were predictors of AROM or swan neck deformity.

Conclusion

Age less than 30 predicted favorable outcome using the Crawford classification.

Name

Amaris Lim

Title

High-Velocity Distal Radius Fractures

Purpose

High-velocity distal radius fractures (DRFs) are a unique group of injuries. There is a paucity of literature on high-velocity DRFs, particularly studies comparing high and low-velocity DRFs in Asian populations. Our study aims to fill this gap.

Method

A retrospective study was carried out in a tertiary hospital in Singapore from January to December 2014. All patients aged above 16 years who presented with DRFs were included in the study. Electronic clinical records and radiographs were reviewed to collect information on patient demographics, AO classification of fractures, mechanism of injury, hand dominance, and associated injuries. Statistical analysis was conducted using the chi-squared test.

Results

Among 430 patients who presented with DRFs, 177 were male and 253 were female. 117 patients (27.2%) presented with high-velocity fractures, while 313 (72.8%) patients had low-velocity fractures. 5 of the patients with high-velocity DRFs sustained bilateral fractures. The patients with low-velocity fractures (n=313) were older (mean age 61.1 ± 12.9) and mostly male (77.8%). Patients with high-velocity fractures (n=117) were younger (mean age 41.4 ± 16.0) and mostly female (72.5%). Among the high-velocity DRFs, 29.5% were AO Type A, 27.9% were Type B, and 42.6% were Type C. The low-velocity DRFs were mostly Type A (57.2%), while 11.8% were Type B and 31.0% were Type C. High-velocity DRFs were more commonly associated with significant associated injuries and injuries to the ipsilateral upper limb, as compared to low-velocity DRFs.

Conclusion

Our study provides data studying the epidemiology, severity and associated injuries of high-velocity DRFs, in comparison with low-velocity DRFs, in the local population.

Name

Ajeet Tiwari

Title

Outcomes of perilunate injuries in our population

Purpose

Perilunate injuries are easy to miss at their initial presentation and a delay in treatment can lead to poor outcomes. These injuries may either be a pure ligamentous type or a combination of fractures with ligamentous injuries. The aim of this study is to present the outcomes of perilunate injuries in our population.

Method

A retrospective review was conducted on all patients who underwent surgical treatment for perilunate injuries at our hospital over a 5-year period. A review of clinical as well as radiographic data was undertaken. The outcomes were also graded based on the modified Green and O'Brien scoring system. Statistical data were reported in mean, range and percentage.

Results

15 patients (all male) were included in this study with a mean age of 38 years. All patients had dorsal dislocations. 10 patients had combined fractures and ligamentous injuries, whereas 5 patients had pure ligamentous injuries. Patients underwent surgery on an average 6.8 days of injury. 14 patients underwent open reduction and one patient was managed by closed reduction. The average follow-up period was 20 months (range: 3-59). At final follow-up, the average arc of wrist flexion-extension was 116 degrees (range: 80-165) and the average grip strength was 71% of the uninjured side (range: 50-94). The average modified Green and O'Brien score was 74% for pure dislocations and 63% for fracture dislocations.

Conclusion

The outcomes of patients with pure ligamentous injuries was better compared to those with fracture dislocations. Arthritis was also more common in fracture dislocations.