

EXPERT OPINION ON PUBLISHED ARTICLES

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Internal fixation of dorsally displaced fractures of the distal part of the radius: A biomechanical analysis of volar plate fracture stability

AA Willis, K Kutsumi, ME Zobitz, WP Cooney
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It is always difficult for orthopaedic surgeons to accept the results of biomechanical testing on synthetic sawbones. However this study is important and relevant because of the recent trend towards volar fixation of distal radial fractures.

The study compared different volar plates and the dorsal Pi plates for extra-articular dorsally comminuted radial fractures in synthetic bone.

The result suggested that the volar locking plates are superior to the neutralisation plates (ordinary non-locking plates) but biomechanically not as good as the dorsal plates (with volar comminution however the dorsal plates were least effective).

Because of the high clinical complication rate with dorsal plates it would seem that volar approaches with locking plates is currently the treatment of choice for those fractures. The exact role of plates, external fixation and K-wires is however not clearly defined.

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Radial portal tendon harvest and interposition in arthroscopic treatment of thumb basilar joint osteoarthritis

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Treatment options for early to moderate (Eaton stages II – III) first carpometacarpal osteoarthritis are fairly limited. Conservative measures include splinting, cortisone infiltration, non-steroid anti-inflammatory drugs (NSAIDs) and specific hand therapeutic modalities to increase stability and mobility.

This study is yet another of recent reports on the arthroscopic management of first carpometacarpal arthritis. The first report was by Menon in 1996.

Evaluation of this joint with debridement and even limited trapeziectomy is described. A tendon slip of the accessory abductor pollicis longus is harvested arthroscopically and used as interposition material.

There have been continued advances in arthroscopic technique for the treatment of thumb basilar joint arthritis. In this study arthroscopic tendon harvesting and interposition is done additionally.

Distal traction was placed on the thumb to distract the trapeziometacarpal joint followed by arthroscopy using a 30°, short, 2.7 mm arthroscope infused by gravity effect.

Arthroscopic hemitracheiectomy of arthritic surfaces was accomplished with a 2.9 mm burr extending down into cancellous bone. The harvested tendon was inserted through the arthroscopic portal into the trapeziometacarpal joint.

Surgical treatment in advanced basal thumb osteoarthritis in elderly patients is well established. The technique of trapezium excision as a stand-alone procedure or in combination with various forms of interposition arthroplasty and/or tendon transfers has been extensively documented. Most series report good results.

Faced with early to moderate symptomatic arthritis of the described joint in younger (40–55 years) women treatment options are however limited. Certainly a complete trapezium excision on these patients would seem excessive and even mutilating.

The possibility of a less invasive, less destructive surgical intervention seems attractive.

By way of an arthroscopic debridement and even tendon interposition, pain relief and time for the patient may be gained.

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Chronic lateral ankle instability and associated conditions: a rationale for treatment

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This is a very valuable article with practical implications. Lateral ankle sprains are the most common musculoskeletal injury. Orthopaedic surgeons treat this injury almost daily and this article reminds us of the associated injuries and conditions of lateral ankle ligament injuries. Most ankle injuries are treated conservatively and recover well although conservative management fails in approximately 20–40% of patients who continue to have chronic lateral ankle instability and pain.

The purpose of this study was to determine the type and frequency of associated injuries and conditions in patients with chronic lateral ankle instability over a six-year period between 1996 and 2002. One-hundred-and eighty ankles in 160 patients had a modified Broström-Gould lateral ankle ligament reconstruction by a single orthopaedic surgeon for chronic ankle instability. Twenty revision procedures were necessary at the time and these results were also incorporated into the final analysis of results.

The focus of the study through a retrospective review of the clinical history, physical examinations, radiographs and intra-operative findings was on conditions specifically found at the time of pre-operative examination. The chronic lateral ankle instability was confirmed by history and physical examination. The time from the original injury to the operative procedure averaged 16 months. In addition to the ligament reconstruction all associated conditions were treated operatively. In assessing the results it is important to note that the authors only concentrated on the extra-articular conditions and injuries found in association with the lateral ligament injuries to the ankle.

Six different associated conditions and injuries were noted during the initial physical examination and later confirmed at the time of surgery. The results were as follows:

1. Peroneal tendon injuries – 28%
2. Os trigonum lesions – 13%
3. Os subfibulare and other lateral gutter ossicles – 10%
4. Hindfoot varus alignment – 8%
5. Anterior tibial spurs – 3%
6. Tarsal coalitions – 2%

In the revision group of 20 patients the most commonly associated condition contributing to either pain or recurrent instability was hindfoot varus in 28% of the cases followed by peroneal injuries in 25% of the cases.

Discussion

What came out of this study was that a high index of suspicion is extremely important when examining either the acute or chronic unstable ankle. The frequency of associated injuries is high and it is important to note that the presence of a varus deformity of the hind foot is a major contributing factor to recurrent instability or pain after a lateral ligament injury to the ankle.

The authors conclude that history and physical examination remain the most accurate means of diagnosing these associated conditions. Meticulous examination of the foot and ankle including foot type and gait analysis is important to diagnose the presence of any abnormalities including hindfoot varus alignment. Interesting is the peroneal tendon tears or retinacular pathology that is suspected with only direct palpation or forced eversion against resistance. They did not suggest sonar examination or MRI confirmation of peroneal pathology. One should think that at least a sonar examination could contribute in making a diagnosis of peroneal pathology, especially with such a high incidence of peroneal tendon affection.

The study identified six associated extra-articular conditions in 64% of 180 ankles with chronic lateral instability. Peroneal injuries occurred with the highest frequency followed by symptomatic os trigonum and antero-lateral impingement lesions. Important to note is that from the 20 revision reconstructions the most common reason for failure was the hind foot varus malalignment group. Although this study was done among military patients with chronic lateral ankle instability these associated conditions to a lesser or greater extent would also apply to the normal population. This study is important to remind orthopaedic surgeons treating these conditions of the high incidence of associated extra-articular injuries and conditions in patients with chronic lateral ligament instability of the ankle.

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Chronic pain: All in the head...?

Fibromyalgia: Update on mechanisms and management

Daniel J Clauw. *Rheumatology Grand Rounds at Rush*, 13(2), Apr 2007, 102-109

Chronic pain syndromes such as fibromyalgia, chronic idiopathic lower back pain, TMJ syndrome and irritable bowel syndrome are part of a clinical spectrum of overlapping disorders that affect a significant portion of the general population. Although the focus of this article was on fibromyalgia, many of the principles outlined can also be applied to other chronic pain states encountered in orthopaedic practice.

Data suggest that there is a familial tendency to develop these chronic pain disorders, and that exposure to physical, emotional or environmental 'stressors' may trigger the initiation of symptoms. Once the illness develops, the majority of the symptoms are likely mediated by central nervous system mechanisms.

Fibromyalgia is extremely familial. If someone has fibromyalgia, the risk of one of their first-degree relatives having fibromyalgia is eight-fold greater (in SLE and RA the odds ratio is 2:3). Pain sensitivity in the population occurs over a wide continuum in a classic bell-shaped curve. Genetic factors explain to a large extent where an individual falls on this continuum, due to polymorphisms of the large number of different genes that involve the metabolism of sensory transmission neurotransmitters (e.g. COMT or beta-adrenergic receptors). If a person is on the far right where they are very sensitive to pain, he or she probably can develop pain without having any inflammation or damage in the peripheral tissues; and that can either be regional or widespread pain.

Environmental factors seem to be important in triggering fibromyalgia in genetically predisposed persons by acting as 'stressors'. Stressors that are capable of causing fibromyalgia include having a '**peripheral pain syndrome**' (i.e. pain due to damage or inflammation of peripheral tissues) or **physical trauma** (including surgery!). There is evidence that Epstein-Barr virus, parvovirus, Lyme disease, and Q fever infections can trigger fibromyalgia, but not the common cold. There is only weak data that **psychological stress and distress** directly causes fibromyalgia. Wars can also trigger the development of this spectrum of illnesses, i.e. the 'Gulf War syndrome'.

The primary problem in fibromyalgia is not that there is too much input coming from peripheral nociceptors, but rather that there is inadequate filtering of that activity in the **central nervous system**, due to decreased activity of descending antinociceptive pathways. These pathways do not work properly in individuals with chronic pain syndromes, so that a lot of nociceptive information that can be filtered out in normal individuals may not be filtered out in these patients.

Treatment

At one end of the continuum, there are some individuals with fibromyalgia (or other chronic pain states) that respond to a single medication or a graded, low-impact exercise programme. At the other end of the continuum is the tertiary care patient with high levels of distress who has no sense of control of their illness, little social support, and has looked toward disability and compensation systems to try to solve their problem. For this individual, and many in-between, multimodal programmes that integrate non-pharmacological (especially exercise, cognitive behavioural therapy [CBT]) and pharmacological therapies are required.

Pharmacotherapy includes tricyclic antidepressants (e.g. amitriptyline), SNRIs or dual receptor inhibitors (venlafaxine, duloxetine, milnacipran), tramadol and pregabalin. More experimental drugs include non-benzodiazepine hypnotics (zopiclone, zolpidem), gamma hydroxybutyrate, pramipexole and tizanidine.

Non-steroidal anti-inflammatory drugs (NSAIDs), opioids and paracetamol are widely used, but numerous studies have failed to confirm their effectiveness as single therapies in fibromyalgia. There is some evidence that these patients may experience enhanced analgesia when treated with combinations of NSAIDs and some of the agents mentioned above. This phenomenon may be a result of concurrent peripheral pain conditions such as concurrent arthritis and/or that these comorbid peripheral pain generators might lead to central sensitisation and worsening of the 'central' pain syndrome.

Hopefully a clearer understanding of the mechanisms involved in the development of chronic pain states, and the rationale behind different treatment modalities, will lead to better management of these often daunting patients.

This is an excellent article on a difficult subject.

Foot and Ankle Reconstruction fellowship

This is a reminder that I would like to accept a South African applicant to my fellowship programme in the future. I think that the opportunity for advanced training would be quite tremendous, and I am sure that it would be a worthwhile six-month fellowship training.

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Differentiating between septic arthritis and transient synovitis of the hip in children

SM Kocher, D Sárakowski, JR Kasser
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A child presenting with an acutely irritable hip can pose a diagnostic problem with possible aetiologies including the following:

- Perthes' disease
- juvenile rheumatoid arthritis
- osteomyelitis
- psoas abscess
- pyogenic sacroiliitis
- septic arthritis
- transient synovitis.

It is important to differentiate between septic arthritis and transient synovitis as quickly as possible, because the two diagnoses have vastly different implications in terms of treatment and morbidity. Many articles have been published confirming that a delay in the diagnosis of septic arthritis is associated with a poor outcome. Nonetheless the differentiating between transient synovitis and septic arthritis can be difficult since these patients have similar symptoms, signs and laboratory findings.

These special investigation results and the clinical findings used to differentiate between the two pathologies have been found to have poor diagnostic use because of the significant overlap between the two groups.

This article is based on a retrograde study of 282 patients admitted to a major tertiary hospital with an acutely irritable hip. The patients were divided into three groups, namely:

- those with septic arthritis
- those with presumed septic arthritis
- those with transient synovitis.

Criteria for classifying the three groups:

	Septic arthritis	Presumed septic arthritis	Transient synovitis
Blood culture	+	-	-
Synovial MCS	+	-	-
Polymorphs in synovial fluid	> 50 000/mm ³	750 000/mm ³	< 50 000/mm ³

The following data was studied in the three groups:

- age
- gender
- date of presentation
- duration of symptoms
- history of fever or chills
- whether the patient could weight bear on the hip
- history of trauma
- recent antibiotic use
- ESR
- WBC count and differential
- haematocrit

- blood and synovial fluid cultures
- evidence of an effusion on X-rays.

When these variables were compared in patients with septic arthritis and those with transient synovitis, they differed significantly, but there was considerable overlap in the intermediate range of values which limited the use of a single variable to differentiate between septic arthritis and transient synovitis.

The same was also true when the variables of septic arthritis and presumed septic arthritis were compared.

A multivariate analysis was done and four independent multivariate predictors were established for differentiating between septic arthritis and transient synovitis, namely:

- history of fever (temp > 38.5 °C)
- inability to weight bear on affected hip
- erythrocyte sedimentation rate > 40 mm/hr
- white blood cell count > 12 000/mm³.

Using the combination of these variables and the known results of the 282 patients, all of whom had an aspiration of the affected hip, some under sonar and some under fluoroscopic guidance, they were able to predict the likelihood of the patient having septic arthritis, depending on how many of the four predictors were positive.

Positive predictors	Percentage chance of it being septic arthritis
0	0.2%
1	3%
2	40%
3	93.1%
4	99.6%

In patients with three or four predictors positive there was a very high chance of the hip being septic.

What exactly the group of 'presumed septic arthritis' represents is uncertain, but the authors felt it was probably a partially treated septic arthritis, as nearly 50% of these patients gave the history of having received antibiotic cover prior to their admission to hospital.

The management of patients based on the predicted risk of septic arthritis of the hip depends on the consequences of false positive and false negative diagnoses. The consequences of missing a septic arthritis can be catastrophic and now where the likelihood of septic arthritis can be predicted, there is no justification for withholding an arthrotomy or aspiration of the hip joint, because of the morbidity associated with the procedure.

Prepared approach to the irritable hip in a child

Three or four predictors positive	Two predictors positive	One or none positive
High probability of septic arthritis	A possibility of being septic arthritis	Remote chance of being septic arthritis
Aspiration in theatre with a view to doing an arthrotomy	Aspiration under sonar or fluoroscopic guidance	Chance without aspirating the affected hip

All registrars **must** read the original article.