ORTHOSPORTS



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Welcome to Orthosports News.

The Spring issue presents two interesting articles on the Shoulder. Dr Jerome Goldberg discusses Pectoralis Major Tears and Dr Doron Sher looks at Reverse Shoulder Replacements.

In our Examination Section Dr Kwan Yeoh covers "Imaging of the Hand and Wrist".

We hope you enjoy this issue - The Team at Orthosports

Pectoralis Major Tears

he Pectoralis Major muscle

L is the big muscle in the chest that provides the chest contour. The muscle extends from the midline of the chest across the shoulder and inserts into the humerus, via a tendon. It has two heads, a large powerful sternal head and a smaller clavicular head. The muscle provides power to the upper arm. Ruptures usually occur at the tendon to bone junction of the humerus but in older patients can occur at the musculotendinous junction.

Pectoralis ruptures are commonly missed. This is a problem, as surgical repair is required in most cases, and needs to be performed within a month of the injury, in order to achieve the best outcome.

These tears usually occur after a significant trauma such as a football tackle or high speed motor cycle accident. Often the injury occurs in persons lifting weights, and occurs during the bench press manoeuvre, when the arm is fully extended and the lifter pushes the weight upwards. It is also common in persons who take anabolic steroids, as the steroids weaken the tendon which attaches to the humerus.

Clinical examination reveals a very obvious loss of the contour of the

chest wall muscles and loss of the anterior axillary fold of the armpit. There is usually upper arm bruising which appears within 24 hours of the injury. Although movements remain good there is marked loss of power of shoulder adduction, forward flexion and internal rotation.



Loss of chest wall and axillary fold contour with a Pectoralis Major tear

The investigation of choice is an MRI where the radiologist is requested to specifically image the Pectoralis Major. An MRI of the shoulder will not see all of the muscle. It is important to try and acertain whether the tear is at the musculotendinous or tendon to bone junction. Ultrasounds are very inaccurate.



MRI film of Pectoralis Major rupture



WHO ARE WE?

Orthosports is a professional association of Orthopaedic Surgeons based in Sydney.

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If the tear is at the tendon to bone junction then an operation can be done to repair the tendon to the bone, using either suture anchors or by creating a bone trough in the humerus and reattaching the tendon with non absorbable sutures.

The sugery requires immobilisation in a sling for 6 weeks post operatively followed by a gentle exercise program. The patient has to avoid heavy lifting and sports for 6 months while the tendon heals to the bone. Long term the patient can resume contact sport but should never extend the arm while doing bench press again (bench press should be done on the floor rather than on a bench).

Chronic tears are difficult to repair surgically and the results of surgery are generally poor. Repairs with tendon grafts have been described but again the results of surgery, using these techniques, are often suboptimal.

Dr Jerome Goldberg

Reverse Shoulder Replacement

Reverse Total Shoulder Replacement is designed specifically for the treatment of shoulder arthritis when it is associated with extensive rotator cuff damage.

Primary Total shoulder replacement is a very effective treatment for painful arthritis of the shoulder but the patient's rotator cuff must be intact for the joint replacement to stay stable and be successful. If the rotator cuff tears, then the shoulder replacement will dislocate or function poorly. Until quite recently there was no adequate solution for the patient with the combination of arthritis and a rotator cuff tear. Significant improvements in motion and patient satisfaction are achievable when a reverse shoulder replacement is performed for loss of shoulder elevation associated with a massive rotator cuff tear.



Reverse tsr showing ball and socket

Failed cuff of tsr needing reverse tsr

"Reverse" total shoulder replacement was first attempted in the 1970's. The name reverse came from the fact that the 'ball' of the shoulder was moved from the humerus to the glenoid and the 'socket' of the shoulder was moved from the glenoid to the humerus. This is the 'reverse' of a 'regular' total shoulder replacement. Unfortunately the initial results were rather poor because the designs placed excessive forces on the glenoid component which then loosened and failed. Much has been learned since then and modern implant design modifications have solved most of the initial problems.

The term Rotator Cuff-Tear Arthropathy was described

by Dr Neer (one of the pioneers of shoulder surgery) in the early 1980s. When the rotator cuff is torn both mechanical and nutritional factors lead to the development of arthritis in the shoulder. If the rotator cuff fails to function the patient can end up with a "pseudoparalytic shoulder" where they are unable to raise their arm away from their body. In the past, treatment for this has ranged from injections and physiotherapy to hemiarthroplasty or fusion of the joint. None of these have provided reliable pain relief and function for the patient.

Nonsurgical management is always attempted first.

This includes activity modification, oral analgesics and NSAIDS, corticosteroid injections and gentle rangeof-motion exercises. A specific deltoid re-education programme can take 8 months to be effective at restoring motion but unless the patient gains early pain relief the exercises are unlikely to be successful. Patients may be able to cope with the pain and maintain an acceptable degree of function if the deltoid is retrained to take over the function of the rotator cuff. Many patients continue to have severe shoulder pain and poor function and therefore become surgical candidates.

Reverse shoulder replacement is very good at restoring functional use of the limb to the patient with a pseudoparalytic shoulder. It provides pain relief and improves function. Unfortunately the loss of the rotator cuff does leave the patient with some functional deficits. The most noticeable of these are weakness of external rotation and some loss of internal rotation.

From a technical perspective it is somewhat harder to perform a reverse shoulder replacement then a primary shoulder replacement with higher overall complication rates. The complication rates are lower in the hands of surgeons experienced in reverse shoulder replacement.

Recovery from a reverse replacement is somewhat quicker than a conventional shoulder replacement because we do not have to wait for the rotator cuff to heal. Typically a patient is kept in a sling for 4 weeks before commencing gentle range of motion exercises. Many of the patients are elderly and do not require formal physiotherapy. As with conventional shoulder replacement the patient is advised not to lift more than 2kg regularly and 5kg occasionally. If there is a concern about bone quality the sling may be left on for longer to allow the glenoid component to incorporate more solidly.



As the results of the surgery improve the indications for the operation are being expanded. It has now become a surgical option for failed conventional total shoulder replacement, patients with a non reparable rotator cuff tear, proximal humeral tumours,

High riding humeral head

proximal humeral fractures and shoulders that have anterosuperior escape of the humeral head. Rates of instability, implant loosening, infection, fracture, and other complications remain relatively high so it is essential for the operation to be performed by an experienced surgeon with strict patient selection and close patient follow-up.

Dr Doron Sher



HAND & WRIST IMAGING

Part 1: Plain radiographs

Imaging the hand and wrist is complex. The wrist consists of 8 bones, and the hand a further 19. With each bone oriented in a slightly different plane, it is impossible to capture all bones and joints ideally in just a few views.

In this article, we'll look at a few tips for optimising the use of plain X-rays in hand and wrist pathology. In the second part of this article (next issue), we'll look at other imaging modalities of the hand and wrist.

PLAIN RADIOGRAPHS

Plain X-rays remain the gold standard baseline imaging modality. They have an obvious use in suspected fracture, dislocation or arthritis.





A "wrist" x-ray does not A "scaphoid" x-ray show the scaphoid in includes an ulnar-d proper profile, missing view, showing the subtle fractures. scaphoid in a way

A "scaphoid" x-ray includes an ulnar-deviated view, showing the scaphoid in a way that will pick up more subtle fractures (white arrow).

However, even ganglions and other soft tissue lumps require a plain X-ray to determine if an underlying joint is the source of the clinically obvious problem.

I also request X-rays for patients with carpal tunnel syndrome, as base of thumb arthritis is a contributing cause of carpal tunnel syndrome and this allows the patient to be properly counselled as to prognosis. The radiographs also affect my management of the patient – if there is a significant underlying wrist pathology, then I may not offer an endoscopic carpal tunnel release. Basically, for just about every hand and wrist condition, plain X-rays have a role as the initial imaging modality of choice.

HOW TO ORDER X-RAYS

It is essential that the request for an X-ray be specific enough for the radiographer to attain the correct views to give clinically relevant information and to allow the film to be reported accurately without missing key findings. This includes being very specific about the intended body part and giving an accurate clinical history.

For example, if a scaphoid fracture is clinically suspected, then ordering a "wrist X-ray" without clinical information is not going to give the correct views to assess the scaphoid, which is oriented in a different 3D plain to the rest of the wrist. The X-ray request should specify that a "scaphoid X-ray" is required and that a scaphoid fracture is suspected, so that the radiographer takes scaphoid specific views. If scaphoid views are not given, then scaphoid fractures may be missed.

Likewise, for example, if a problem is suspected of the proximal interphalangeal (PIP) joint of the ring finger, then the X-ray request should ask for "X-ray of PIP joint of ring finger". A general "hand X-ray" will not profile the articular surface of the joint correctly. And because the ring finger consists of MCP, PIP and DIP joints, a "ring finger X-ray" will offer a compromised view of all three joints rather than a specific view of





A lateral x-ray of the "hand" misses the pathology.

A lateral x-ray of the "PIP joint of the ring finger" demonstrates the PIP joint dislocation.



A standard lateral view of the wrist, taken with the forearm flat on the table, does not show the articular surface of the radius due to its inclination in the anatomical plane.



An x-ray specifying a suspected fracture of the distal radius should be taken with the hand raised on a foam support, to show the distal radius articular surface in profile (white arrow).

the main joint of concern, which can again lead to missed diagnoses.

In general, a well-trained and experienced radiographer should be able to determine the correct views to take given a request form with sufficiently detailed clinical information. It is important that you align yourself with a local radiology practice where this is the case.

Dr Kwan Yeoh

Orthopaedic Surgeons and their Interests

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