

Posterior Elbow Injuries

Contributors

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Overview

In a patient presenting with pain and/or swelling relating to the posterior aspect of the elbow it is important to consider the following conditions: olecranon bursitis, elbow dislocation, triceps tendinopathy and posterior impingement.¹

A bursitis occurs when a bursa (see description in the anatomy section) is irritated which leads to an increased production of synovial fluid and a thickening of the bursa.² Olecranon bursitis can either be septic or non-septic. In non-septic olecranon bursitis there is sterile inflammation either due to trauma (a direct blow or mild repetitive trauma) or due to a systemic condition (e.g. Gout or Rheumatoid Arthritis). In septic bursitis the inflammation is caused by infection by a micro-organism.

An elbow dislocation is where the joint surfaces become separated. Elbow dislocations are uncommon with an incidence of 6-8/100,000 adults a year.³ An elbow dislocation can either be simple or complex. A simple elbow dislocation involves disruption of the joint and soft tissues, e.g. ligaments, and can involve an avulsion fracture but there is no other fracture. A complex elbow dislocation involves a dislocation with an associated fracture.³ Elbow dislocations are most likely (>90%) to occur in the posterior or posterolateral direction and 20% to 50% are associated with fractures.^{3,4} The likely mechanism of injury is a fall on an outstretched hand.³ It is important to examine the neurovascular status of the limb distal to the injury e.g. check for presence of symmetrical radial pulses and test the function of the radial, ulnar and median nerves.⁴

Whilst more uncommon, patients whose work or recreational activities involve repetitive forced elbow extension can experience triceps tendinopathy.¹ In addition, in osteoarthritis of the elbow an osteophyte can form and cause posterior elbow pain due to posterior impingement.¹

olecranon bursitis if the patient presents with any of: tenderness, pain, erythema or warmth over the olecranon, or if they are systemically unwell e.g. fever.^{1,2}

Case studies

A 20 year old male presents to his general practitioner with a tender swelling on the back of his elbow. It has come on over a few days, there is no history of trauma to the elbow or forearm. He is currently studying hard for upcoming exams. He feels well in himself and no other joints are swollen. On examination his observations are normal, he has a well-defined tender swelling over his olecranon, his elbow range of motion is normal. There are no skin changes over the swelling e.g. cellulitis. He is diagnosed with olecranon bursitis.

A 40 year old male presents to the accident and emergency department holding his arm across his body. He explains he fell off his bike and had put his arms out to break his fall but experienced sudden pain in his right elbow. On examination there is obvious deformity of the elbow with a posterior swelling, he is unable to move his elbow at all. His right radial pulse is present and the motor and sensory function of the median, radial and ulna nerves is intact. X-rays confirm a simple elbow dislocation (no associated fractures).

Anatomy

The elbow joint is formed by an articulation between the distal humerus and the two forearm bones (the proximal radius [radial head] and proximal ulna).³ The ulnohumeral joint is a hinge joint with the biceps and triceps muscle producing flexion and extension of the forearm. Pronation and supination of the forearm occur at the radioulnar joint which is just distal to the elbow joint. Key anatomical structures at the posterior aspect of the elbow are the olecranon process of the ulnar and the olecranon bursa (a synovial fluid filled sac). The bursa sits in between the olecranon and overlying connective tissue and reduces friction between the two structures during movement.²

Aetiology

The aetiology of bursitis is unclear.⁵ However, olecranon bursitis is more common in people who do activities (work or sport) involving repetitive elbow movements or contact, for example: gardeners, mechanics, plumbers drivers and students.² Athletes at increased risk are those involved in sports such as gymnastics, weightlifting and rugby.² The aetiology of a dislocation is traumatic with 50% of elbow dislocations occurring during sports-related activities.⁴

Clinical Features

The clinical features of conditions to consider as causes of posterior elbow pain and/or swelling are presented in this Table:

If the patient can move their elbow through a full range of motion the cause of their elbow pain is unlikely to be a fracture or an intra-articular problem e.g. synovitis, septic joint.^{6,8}

Clinical feature	Olecranon bursitis	Elbow dislocation	Triceps tendinopathy	Posterior impingement
Inspection	Cystic swelling over olecranon.	Obvious deformity of the elbow with posterior swelling.	Normal	Normal
Pain	The patient may complain of generalised pain around the elbow.	Significant pain on any attempt to move the elbow.	Tenderness at Triceps insertion on the proximal olecranon process.	Pain on forced full extension of the elbow.
Swelling	Well defined swelling over the posterior aspect of the elbow	Elbow deformity will give look of posterior elbow swelling	No elbow swelling	No elbow swelling
Range of Movement (ROM)	Normal	Patient presents holding the arm in flexion with little to no range of motion.	Normal	Decreased range of elbow extension. The patient may present with a fixed flexion deformity.
Clinical Tests	-----	Neurovascular examination of distal forearm – assess brachial and radial pulses and function of radial, ulnar and median nerves.	Posterior elbow pain reproduced with resisted elbow extension.	-----
Investigation	Aspirate and send fluid for analysis if any: pain, swelling, warmth and erythema over olecranon.	Elbow x-ray (2 views)	None required	Elbow x-ray (2 views)
Management	See Management Options section.	See Management Options section.	Relative rest, ice, analgesia, physiotherapy.	Avoid painful movements. Consider orthopaedic opinion.

When a patient presents following a traumatic injury always examine and document the neurovascular status of the limb distal to the injury e.g. for a traumatic elbow injury check for symmetrical radial pulses and test the motor and sensory function of the radial, ulnar and median nerves.⁴

Investigations

In a patient with a probable or possible septic olecranon bursitis the swelling should be aspirated and fluid sent for analysis.² When requesting fluid analysis the request should include: gram staining, culture, crystal examination, differential white cell count and glucose levels.²

If a patient presents with elbow pain following trauma and there is reduced elbow range of motion, function or deformity then it is important to request AP and lateral x-rays of the elbow joint. The x-rays are to investigate for a dislocation and for an associated fracture.⁶

Management Options

For all patients with olecranon bursitis management should include conservative measures for symptomatic relief e.g. rest, ice, protection, simple analgesia (paracetamol or a NSAID e.g. ibuprofen if not contraindicated). For protection patients should try to avoid direct trauma or pressure to the elbow and should use protective elbow pads.²

If septic bursitis is suspected the patient should be admitted to hospital if: they are systemically unwell, have extensive cellulitis, a pointing abscess, or if it is not possible to aspirate a sample of fluid in primary care.² In a systemically well patient with possible septic bursitis commence antibiotics, ideally after aspirating and sending fluid for analysis. Whilst awaiting microbiology results an oral antibiotic which covers staphylococcal and streptococcal species, e.g. Flucloxacillin, should be used empirically.² However, local guidelines should be followed. Patients should be reviewed after 7 days to assess response and antibiotics should be continued if the patient's symptoms have improved but not completely resolved. If the patient's symptoms are not improving consider hospital admission or referral to secondary care.

The majority of patients with non-septic bursitis respond well to conservative management.² However, provide safety-net advice to patients to re-attend if they experience worsening symptoms e.g. increasing pain, redness, warmth or a fever. Rare complications of septic olecranon bursitis include a fistula connecting the bursa to the skin or systemic infections e.g. secondary septic arthritis or sepsis.²

The initial management of a patient with a dislocated elbow is to provide adequate analgesia and/or sedation. If imaging confirms a simple dislocation then reduction should be attempted.⁴ After successful reduction the neurovascular status of the forearm should be re-examined, the elbow placed in a posterior splint at 90 degree flexion and neutral rotation of the forearm. Repeat x-rays should be requested to confirm whether the reduction was successful.⁴ A short period of immobilisation (one week) can help reduce pain but then patients should begin physiotherapy.⁷ Early elbow mobilisation results in better outcomes for example improved pain, range of motion and return to work over prolonged immobilisation.⁷

Prevention

Risk factors for septic bursitis include prior aspiration and infiltration of the bursa so good hand hygiene and an aseptic non-touch technique is imperative if performing these procedures.²

References

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