

December 2011

## MUSCULOSKELETAL CORTISONE INJECTIONS

Diagnostic imaging has a clear role in the diagnosis of musculoskeletal disease. Image-guided intervention has also become well established in the treatment of painful conditions. At ARG musculoskeletal injections most commonly use a mixture of cortisone and long acting local anaesthetic.

### Cortisone

Corticosteroid preparations can be soluble or insoluble (microcrystalline). The insoluble formulations theoretically last longer in joints and tissues. Studies have shown clinical effect is widely variable, with reported average durations of up to 66 days, with individual response times of up to 6 months.

Despite variations in biologic and pharmacologic half life, clinical efficacy has been shown to be similar between formulations. At ARG most injections are performed with triamcinolone (Kenacort) 40mg and betamethasone acetate / betamethasone sodium phosphate (Celestone) 5.7mg.

### What are the indications?

Cortisone can be of benefit in numerous inflammatory conditions. Some of the more common indications are listed below.

1. Bursitis
2. Tenosynovitis (not chronic tendinosis)
3. Arthritis (inflammatory and osteoarthritis), including non-surgical candidates and patients waiting for joint replacement
4. Adhesive capsulitis
5. Ganglia (possibly from protein catabolism rather than anti-inflammatory effect)
6. Morton's neuroma
7. Nerve root sleeve injections for radicular pain
8. Epidural injections for diffuse lumbar pain

### What is the role of image guidance?

Many clinicians are experienced in local and steroid injections around joints. Image guidance is often not required. However imaging benefits include

1. Access to deep structures such as the hip and facet joints which are clinically difficult to inject
2. Avoidance of intratendinous injection which can cause tendon damage
3. Avoidance of neurovascular structures
4. Quick access to the relevant site with less needle trauma for the patient

### Contraindications

1. Local or intra-articular sepsis
2. Bacteraemia
3. Intra-articular fracture

### Relative Contra-indications

1. Juxta-articular osteoporosis
2. Joint injection within 6 weeks, or 3 x in 1 year

### Risks & side-effects

Many systemic cortisone side effects are minimized as joint injection usually only releases small doses into the circulation.

Steroid flare: A small percentage of patients have deterioration of their joint pain following injection usually for less than 24 hours. Paracetamol, NSAIDS or ice can assist in management.

Infection: (<0.1%) All injections at ARG are performed under antiseptic conditions.

Endocrine: Hyperglycaemia, particularly in diabetics usually lasts for 3-5 days after injection.

Skin depigmentation or atrophy: Relevant for superficial injections in cosmetic areas including the 1<sup>st</sup> CMC joint or de Quervain tendons. Changes usually subside over a 6 month period. Celestone is preferable for superficial injection as it has a lesser association with these skin changes than triamcinolone (Kenacort).

Tendon rupture or joint weakening: Case reports of tendon rupture after intra-tendinous injection are common in the literature. Peritendinous injection also predisposes to rupture. Heavy loading should ideally be avoided for 2-6 weeks after injection.

## Local Anaesthetic and Cartilage Toxicity

- Recent evidence suggests intra-articular injection of high dose local anaesthetic may cause cartilage damage, particularly bupivacaine (Marcaine)
- Adrenaline mixed with local anaesthetics can potentiate chondrotoxicity

Although the clinical significance of the above findings is still debated, recommendations (and ARG practice) include:

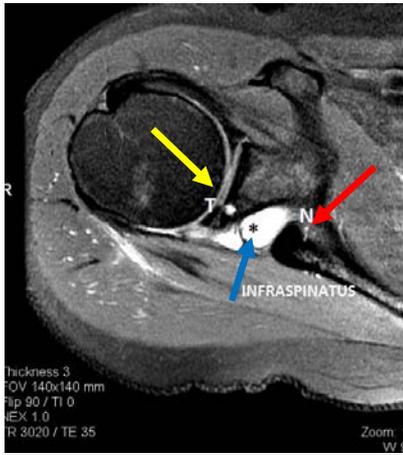
1. Use of ropivacaine for intra-articular injections rather than bupivacaine
2. Injecting the smallest practical volume of local anaesthetic to achieve intra-articular anaesthesia
3. Avoiding intra-articular injections of local anaesthetic mixed with adrenaline

## References

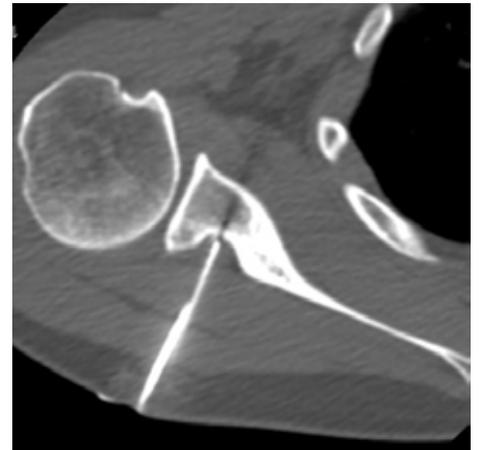
1. MacMahon et al. *Radiology* 2009 252:3 "Injectable Corticosteroid and Local Anaesthetic Preparations"
2. Kamath et al. *Skeletal Radiology* 2008 37:871-873 "Cartilage toxicity from local anaesthetics"

**Sub-specialist expertise: ARG has 6 musculoskeletal and 3 interventional radiologists who can assist with enquiries about performing image guided procedures.**

**BARNABY CLARK**



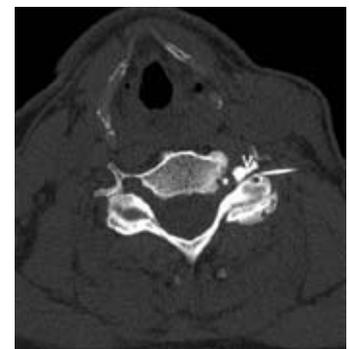
**Fig 1a** (left): Axial MR in a patient with shoulder pain showing a labrum tear (yellow arrow) with a paralabral cyst (blue arrow) in the spinoglenoid notch. The cyst compresses the suprascapular neurovascular bundle (red arrow) and is causing subtle neuropathic oedema in the infraspinatus muscle belly.



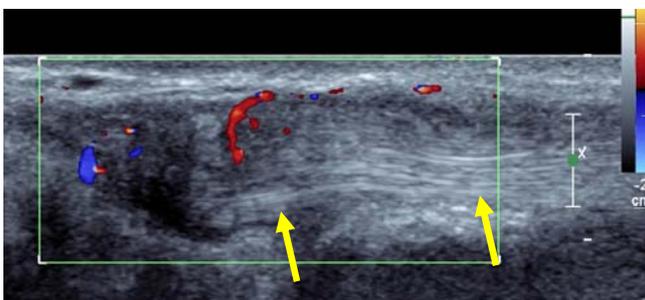
**Fig 1b** (right): Axial CT with needle placement to the paralabral cyst. Aspiration and injection of cortisone was performed to good effect.



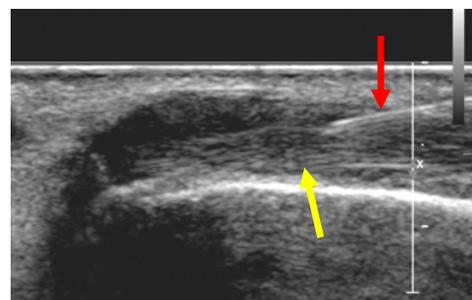
**Fig 2** (left): Fluoroscopic guided left hip steroid and local anaesthetic injection. Contrast outlines the hip joint space confirming intra-articular needle placement.



**Fig 3** (right): CT guided foraminal steroid injection for left C6 radiculopathy. Contrast confirms injectate next to C6 nerve root (\*). Careful positioning avoids injury to the vertebral artery (V).



**Fig 4a:** Longitudinal ultrasound image of the 1<sup>st</sup> extensor compartment showing tendon and tendon sheath thickening of abductor pollicis longus with accompanying hypervascularity, confirming de Quervain's tenosynovitis. Tendon (yellow arrows)



**Fig 4b:** 25G needle placement to the tendon sheath for local and steroid injection. Ultrasound confirms peritendinous injection avoiding tendon injury. Tendon (yellow arrow); needle (red arrow)

**The partners, associates and staff of Auckland Radiology Group extend season's greetings to you all and wish everyone a happy and successful New Year.**