THE TREATMENT OF SPORTS INJURIES BY LOCAL INJECTION

S. BENTLEY, MB, ChB

Student Health Service, University of Manchester

ABSTRACT

Local injections of corticosteroids are frequently employed in the management of soft-tissue injuries. Side effects and contraindications of this treatment are discussed with reference to relevant literature. Indications for steroid therapy are described.

INTRODUCTION

Many substances can be introduced locally for the treatment of soft-tissue disorders, but in the present paper the role of local corticosteroids only will be considered.

Synthetic corticosteroids exert a powerful anti-inflammatory effect, both when administered systemically and injected locally. There is no evidence that local injections of corticosteroids have any direct healing effect, and their healing action relies on local inflammatory response suppression. In fact, retarded fibroblast activity may well delay healing.

The various commercially available steroids vary in potency. When compared with hydrocortisone, methylprednisolone and triamcinolone have approximately four times greater anti-inflammatory effect, whilst the effects of beta- and dexamethasone are more than thirty times greater. These variations in potency are not always reflected in clinical improvement. In one study of the effect of intra-articular injections into knees of patients with rheumatoid arthritis, the average duration of pain relief was 6.0 days following hydrocortisone 37.5 mg, 7.6 days following dexamethasone 6.0 mg, and 7.7 days following triamcinolone diacetate 30 mg (Hollander 1978).

HAZARDS OF STEROID INJECTIONS

When choosing a local steroid, some factors that have to be considered are anti-inflammatory effect, dosage volume and the possibility of local and general side effects. Because of the relatively high potencies of the commercially available analogues of hydrocortisone,

these are preferred by many physicians since lower injection volumes may be used; for example 1 ml of methylprednisolone acetate is equivalent to 10 ml of hydrocortisone acetate in terms of potency.

Local side effects have been reported frequently following steroid injection, the commonest being subcutaneous atrophy described by Beardwell (1967), Cassidy and Bole (1966), Goldman (1962), Schetman, et al (1966), and Fisherman, et al (1962). The most commonly cited steroid causing these changes was triamcinolone, Cassidy and Bole (1966), Schetman, et al (1966), Fisherman, et al (1962), but in a study of methylprednisolone acetate in the treatment of Osgood-Schlatter's disease the incidence of subcutaneous atrophy was 12.9%, (Rostron and Calver 1979). Subcutaneous injections have been reported in the above papers to cause an atrophic change in the skin, with associated depigmentation, telangiectasia and striae. Whilst atrophy and depigmentation may well be reversible after several years, fat atrophy and striae are usually permanent.

It is important that potent *corticosteroid preparations are not injected into the substance of tendons*, as this can lead to degeneration and rupture. This is probably most commonly seen in the Achilles tendon, but has also been reported in the patellar tendon. Whether this is a direct steroid effect or the consequence of the injection of a volume of fluid is uncertain, but it would appear to be an eminently avoidable side effect. A definite synovial sheath is probably the most helpful guide to correct placement of the injection.

As with all steroids, care should be employed in individuals with known or suspected peptic ulceration, pulmonary tuberculosis or when live virus vaccination is planned.

INDICATIONS FOR USE

For successful results an accurate knowledge of anatomy together with precise placement is essential. Provided that care and common sense are employed the benefits of steroid injection far outweigh the disadvantages.

In the arm, most injections in sports medicine clinics are given into the shoulder and elbow areas. In the shoulder the syndrome of supraspinatus tendonitis, with the classical painful arc syndrome, is frequently seen. Other painful conditions afflicting the shoulder joint in athletes include bicipital tendonitis, where the painful area is usually in the bicipital groove, and subacromial entrapment syndromes or bursitis. Injections of 20-40 mg of Depomedrone and a local anaesthetic are often curative when followed by suitable rehabilitation. Where the pain is thought to be due to ectopic calcification as seen on X-ray, the results of steroid injection are often dramatic — though this may be the result of needling the encapsulated material and releasing pressure, rather than any direct effect of the steroid. Also steroid injection may be used in acromioclavicular subluxation with pain.

Fig. 1: Posterior view of the scapula with the insertion of supraspinatus.

Most practitioners will be familiar with the use of steroid injections around the elbow, as tennis elbow is considered by many to be the commonest indication for the use of local corticosteroid therapy. The diagnosis of this condition is simple — tenderness at the origin of the common extensor group of muscles to the lateral epicondyle, and a positive Mill's sign (pain at the site of tenderness when the elbow is extended, with the forearm fully pronated and the wrist fully flexed). Tennis elbow is also an area where the effects of steroid injection have been assessed in a controlled study. Day, Govindasammy, et al (1978) compared the effects of a

steroid, in this case 1 ml (40 mg) of Depomedrone, with the effects of 1 ml of 1% lignocaine, or 1 ml of physiological saline. The last named preparation was introduced to exclude possible mechanical dilation as a factor causing improvement. The results were dramatic.

Fig. 2: Shows the various bursae around the shoulder joint.

Of 36 cases (i.e. below lesions injected with Depomedrone, 33 were classed as improved or cured. In the lignocaine group, of 35 cases only 7 were so classified, and only 7 of the 29 of the saline group. These results were highly significant, $p < 0.001$.

In golfer's elbow — affecting the common flexor origin from the medial epicondyle — the physical signs are similar though reversed. The true epicondylitis can be confused with medial ligament strains of the elbow — sometimes seen in javelin throwers — though here again local steroid therapy may be effective.

Fig. 3: The common extensor origin at the elbow.

Tendon sheath lesions in the arm are often seen and respond well to steroid therapy. The forearm extensors are often affected in racket sports and present a clinical picture of swelling, pain and crepitus. De Quervain's syndrome, where the abductor pollicis longus and extensor pollicis brevis are affected as they pass over the styloid process of the radius, is also commonly seen in sports where the wrist is heavily used. In both these conditions steroids can be helpful, but severe cases often require surgical decompression.

In axial musculoskeletal problems, steroids are less frequently used. In whiplash injury with pain and tenderness over an interspinous joint, steroid injections may be helpful, but often the tenderness is diffuse and injection is not practicable.

Intercostal strains ("cough" strains) can produce local tender spots, and again use of injection may be beneficial.

Persistent pain at the attachment of the rectus abdominis to the pubic ramus may follow traction injury to this muscle, and again calcification may show on X-ray. Here rapid resolution of symptoms often follows injection.

In lumbar disc lesions it has been claimed that lasting relief may be obtained from the epidural injection of steroids. This procedure is not without hazards, and is best left to centres skilled in its use.

The lower limb has several sites where steroid injection may be beneficial. The attachment of the adductor longus to the inferior pubic ramus may be the site of an enthesiopathy, similar in pathology to tennis elbow. When the diagnosis is certain, local steroids may be beneficial. However, the anatomy of the area means that several other conditions may be present with similar symptoms; even femoral herniae have been injected by over-zealous physicians, and pubic symphitis may be present with referred pain to the groin.

The ligaments around the knee may be the site of prolonged pain after injury, and steroid injection, carefully infiltrated around the tender site, may reduce pain and speed rehabilitation.

The tibial tendons around the ankle are, like those tendons at the wrist, a frequent site for tenosynovitis, and the use of steroid/local anaesthetic combination is often curative. As mentioned previously the Achilles tendon possesses no definite sheath, but only a loose paratenon of connective tissue. Though an Achilles peritendonitis will often respond to steroid injections, care must be taken to avoid injection into the substance of the tendon.

Another common site of pain is the heel. The so-called plantar fasciitis, presenting with tenderness of the base of the os calcis, is frequently seen in athletes, especially when long distance running on hard surfaces is practiced. X-ray will often show a typical calcaneal spur. Relief is frequently obtained with steroid injections into the tender area, but advice on footwear, padding, etc. may be needed to help avoid recurrences.

The list of conditions where steroid injection may be employed is by no means exhaustive, but intended purely as a guideline. It must, however, be emphasised that the local use of potent corticosteroids is not without its hazards. The physician who is conversant with his own choice of preparation, who is accurate in the placement of the injection, and who is aware of the precautions to be observed, will find the use of local steroid injection of immense benefit in the management of soft-tissue sports injuries.

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REFERENCES

- Beardwell, A., 1967 "Subcutaneous atrophy after local corticosteroid injection". *Brit.Med.J.* 3: 600.
- Cassidy, J. T. and Bole, G. G., 1966 "Cutaneous atrophy secondary to intra-articular corticosteroid administration". *Ann.Int.Med.* 65: 1008-1018.
- Day, B. H., Govindasamy, N. and Patnaik, R., 1978 "Corticosteroid injections in the treatment of tennis elbow". *Practitioner* 220: 459-462.
- Fisherman, E. W., Feinberg, A. R. and Feinberg, S. M., 1962 "Local subcutaneous atrophy". *JAMA* 179: 971-972.
- Goldman, L., 1962 "Reactions following intralesional and sublesional injections of corticosteroids". *JAMA* 182: 613-616.

Hollander, J. L., 1978 "Intrasynovial corticosteroid therapy". Proceedings of the XVII Nordic Congress of Rheumatology.

Rostron, P. K. M. and Calver, R. F., 1979 "Subcutaneous atrophy following methylprednisolone injection in Osgood-Schlatter epiphysitis". J.Bone Joint Surg. 61A, 4: 627-628.

Schetman, D., Hambrick, G. W. and Wilson, C. E., 1966 "Cutaneous changes following local injection of triamcinolone." Arch.Dermatol. 88: 820-828.