THE USE OF HYDROCORTISONE LOCALLY IN THE TREATMENT OF SOFT TISSUE LESIONS

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Hollander *et al.*, (1951) showed that injection of hydrocortisone into the inflamed knee joint of a patient suffering from rheumatoid arthritis was followed by striking relief of pain and stiffness, and a reduction of tenderness and swelling of the joint. There was no improvement in symptoms or signs in other affected joints. Measurements of intra-articular temperature showed a fall of 0.4° to 3.0°C . following injection of hydrocortisone into an inflamed knee but no fall in the equally inflamed contralateral knee which had not received hydrocortisone. These results suggested that improvement in the treated joint was due to a local action of hydrocortisone; especially as the amount of drug injected, namely a single injection of 25 mg., was too small to exert a recognisable systemic effect in rheumatoid arthritis. This evidence of a local action of hydrocortisone on inflammatory processes has led to the trial of the drug in a variety of painful lesions of connective tissue in the past four years. Local injection of hydrocortisone has been found to be particularly valuable in the treatment of tennis elbow, bursitis, including subacromial bursitis, and tenosynovitis.

Tennis Elbow

Intra-articular and extra-articular forms of tennis elbow have been described. In the former the lesion responsible for the symptoms is in a fringe of synovial membrane interposed between the radial head and capitellum. This synovial fringe becomes thickened as a result of repeated minor trauma or torn in a single traumatic incident. In the extra-articular variety the lesion is in the common extensor tendon at its attachment to the external epicondyle. The lesion is generally supposed to be due to a partial or complete tear of the fibres of the common extensor tendon but histological appearances suggest a degenerative rather than a traumatic lesion. Inflammation of the radio-humeral bursa (Osgood's bursa) is a rare cause of tennis elbow. The majority of cases are extra-articular.

Extra-articular tennis elbow is easily recognised by the characteristic symptoms and signs. The patient complains of pain on the outer side of the elbow radiating along the postero-lateral aspect of the forearm. The pain is made worse by using the hand and arm. On examination gripping and dorsiflexion of the wrist against resistance obviously increase the pain and there is marked tenderness over the antero-lateral aspect of the external epicondyle. Movements of the elbow joint are full. In the intra-articular variety of tennis elbow symptoms are similar. Examination however, reveals tenderness over the radio-humeral joint usually posteriorly but sometimes anteriorly. Extension of the elbow is slightly restricted or there is a distinct feeling of resistance on attempting full extension.

Tennis elbow recovers spontaneously in periods varying from 2 to 20 months from the onset. It usually causes such pain and inconvenience that not many patients are content to await natural recovery. In the intra-articular type manipulation by Mill's method often relieves the symptoms. Extra-articular tennis elbow can be cured by operation. In the operation usually performed, the common extensor tendon is cut away from the lateral epicondyle with or without the periosteum. The operation is however undertaken reluctantly for a minor disability which will eventually recover spontaneously. Other forms of treatment such as rest in a cock-up splint, manipulation, physiotherapy and X-ray therapy have been used extensively but the results have been disappointing. There is now no doubt that local injection of hydrocortisone is an effective remedy for tennis elbow. Murley (1954) treated 19 patients with hydrocortisone and 18 patients with procaine and was able to show that hydrocortisone caused relief of symptoms in a high proportion of cases.

The method of giving the injection is simple. All that is necessary is to inject 25 mg. hydrocortisone acetate suspension into the tender area in the region of the lateral epicondyle. An

injection of hydrocortisone into such a tender area can however be extremely painful and it is therefore a good plan to inject a small amount of 2 per cent. Procaine solution first.

In successful cases pain becomes less within 24 to 48 hours and usually within one week there are no symptoms or signs apart from slight local tenderness. A few patients have increased pain and occasionally there is slight swelling at the site of the injection. This local reaction to the injection usually disappears in 48 hours though occasionally it lasts up to five days. The immediate results of treatment are extremely satisfactory. Thus 45 out of 57 patients treated at the Middlesex Hospital had relief of symptoms. Some patients however noticed aching after heavy work though they had no pain in ordinary everyday activities. The relief followed one injection in 41 patients but the remaining four required a second injection. A reduction in the severity of symptoms occurred in eight patients and in four there was no benefit. Follow up over a period of one year has shown that about half the cases relapse. The symptoms on relapse are not usually so severe as they were originally and they respond to a further injection of hydrocortisone. In spite of the occurrence of relapses and the occasional failure even with several injections, the local injection of hydrocortisone is a most valuable remedy for tennis elbow comparing very favourably with other forms of treatment.

Golfer's Elbow

Golfer's elbow or medial epicondylalgia is a condition very similar to extra-articular tennis elbow but it is not so common. Examination reveals tenderness over the anterior aspect of the medial epicondyle. Symptoms are relieved by injection of hydrocortisone into the tender area.

Periarthritis of Shoulder

Various cervical, thoracic and abdominal lesions may give rise to pain referred to the shoulder. Although stiffness of the shoulder may occasionally arise from disuse in such cases, movement of the joint is usually full and painless. Arthritic or traumatic lesions of the sternoclavicular or acromioclavicular joints can cause pain in the shoulder aggravated by movement but are easily recognized by the presence of tenderness and often by swelling of the affected joint. Pain in the shoulder with limitation of movement of the joint may result from lesions such as primary or secondary neoplasm or Paget's disease in the upper end of the humerus, and from tuberculous arthritis, rheumatoid arthritis or osteoarthritis of the gleno-humeral joint. In about 80 per cent. of cases presenting with pain and limitation of movement of the shoulder the

cause is peri-articular. Degenerative changes in the rotator cuff, and particularly in the supraspinatus tendon, with or without calcification are often found at operation in these cases of periarthritis. Inflammation of the subacromial bursa is also a common finding and is probably secondary to the rotator cuff lesion. The use of the terms supraspinatus tendinitis, subacromial bursitis and capsulitis of the shoulder arises from an attempt to define the site and extent of the periarticular lesion more accurately but it is not always easy to make these distinctions. In practice the cases of painful shoulder fall into three groups: (1) Acute periarthritis, (2) Simple chronic periarthritis (without much limitation of movement), (3) Chronic periarthritis with adhesions. Where there is a definite history of injury it is important to bear in mind the possibility of rupture of the supraspinatus tendon for the treatment of this lesion is surgical. The characteristic feature of this condition is immediate weakness of the arm following the injury, the patient being unable to perform the first 15° of abduction. If, however, he is assisted with the initial phase of abduction he can complete the movement. In addition the tuberosity of the humerus may appear unduly prominent on the affected side and a sulcus may be seen or felt near the tuberosity where the tendon should be.

Acute Periarthritis

There may be a history of injury to the shoulder or of a fall on the outstretched hand but this is not always so. The patient develops intense pain in the shoulder. The pain is present at rest often preventing sleep, and it is aggravated by the slightest movement of the arm. Movement of the shoulder is restricted because of the pain. Marked tenderness is present over the anterior aspect of the shoulder in the region of the greater tuberosity and between it and the acromion process. It is in these acute cases that hydrocortisone is extremely beneficial. Hydrocortisone is injected into the subacromial bursa. The needle attached to a syringe containing 2 per cent. Procaine is directed towards the superior facet of the greater tuberosity of the humerus and advanced until the point of the needle strikes bone. It is then withdrawn about 1 mm. The procaine solution should flow easily after this slight withdrawal of the needle. The piston of the syringe should be withdrawn and occasionally chalky material will be aspirated; 25 to 50 mg. of hydrocortisone should then be injected. Within 24 to 48 hours of the injection there is usually relief of the constant severe pain though movement may still be painful. In the ensuing week a steady increase in the range of painless movement may be noted and as long as this improvement continues

no further injection need be given. Often only one injection ensures uninterrupted recovery, but if observation shows that improvement has ceased or is tardy there should be no hesitation in giving one or more further injections. The patient should be encouraged to increase the range of movement of the shoulder each day provided that the attempt to do so is not followed by a return of rest pain. A useful measure to overcome residual stiffness is the performance of pendulum exercises. With the trunk bent forward the patient swings the arm in antero-posterior and medio-lateral directions. These exercises are comparatively painless as there is no pinching of the inflamed tissues of the subacromial bursa between the greater tuberosity of the humerus and the acromion such as occurs in abduction of the shoulder. Relief of acute rest pain occurs in about 75 per cent. of cases (Robecchi and Capra, 1953; Overton, 1954). In the remainder partial relief occurs in the majority but a few experience no benefit. Recovery occurs eventually in the natural course of acute peri-arthritis and is then permanent. The same applies when recovery is accelerated by the use of hydrocortisone.

Simple Chronic Peri-arthritis

The patient complains of pain in the shoulder region particularly near the insertion of the deltoid muscle. Pain on movement is the outstanding symptom, it being most severe on abduction at the moment when the greater tuberosity passes under the acromion process. There may be some pain at rest, especially at night when it may be aggravated by lying on the affected side. Examination reveals tenderness over the greater tuberosity. There may be no limitation of movement or slight limitation of abduction and rotation. Calcium deposits in the rotator cuff will be revealed by X-ray in about half the cases. An injection of hydrocortisone into the subacromial bursa produces excellent results in about half the cases, a few obtain partial relief of symptoms, and some no benefit whatever. The greater the severity of the pain the more likelihood there is of a successful result. Relief of symptoms becomes less likely in limitation of movement rather than pain is the predominant feature of the case.

In this group should be included those patients who complain of pain over the anterior aspect of the shoulder, made worse by elevating the arm, and with tenderness over the bicipital groove. The source of the pain is a tendinitis of the long head of the biceps or tenosynovitis of its sheath. An injection of hydrocortisone into the bicipital groove relieves the symptoms in these cases.

Chronic Peri-arthritis with Adhesions

In this condition, also known as 'the frozen

shoulder' adhesions in the subacromial bursa limit gleno-humeral movement. In a severe case movement at the shoulder may be almost entirely due to rotation of the scapula on the chest wall, and this can be appreciated by inspection and palpation of the scapula during active and passive shoulder movement. These patients complain of pain in the shoulder but often stiffness is the principal symptom. Tenderness is less intense and not so localized in contrast to the findings in acute and simple chronic peri-arthritis. Hydrocortisone injection rarely produces much benefit in this type of case. If pain is a marked feature of the case however, it may be relieved by an injection, and this aids mobilization of the shoulder by exercises which are an essential part of the treatment. Many cases will recover after a period of a few months to one year, but if improvement is not occurring as shown by the failure to increase the range of movement, the question of manipulation under anaesthesia must be considered. Ramsey and Key (1953) consider that local injection of hydrocortisone at the time of the manipulation makes the post-operative course less painful and thus it is easier to maintain the restored range of movement.

Bursitis

There is no doubt that cases of traumatic prepatella and olecranon bursitis respond favourably to hydrocortisone. Aspiration followed by injection of 12.5 mg. of hydrocortisone into the bursa relieves the pain and residual swelling disappears in 7 to 10 days. In the series treated by Young *et al.*, (1954) 88 per cent. had complete and apparently lasting remission, and Ramsey and Key (1953) report similar results. Crisp and Kendall (1955) had a favourable response in 70 per cent. of cases but relapse occurred within two months and further injections again gave only temporary relief. Ramsey and Key (1953) have also treated bunions which were inflamed but not septic. Hydrocortisone 12.5 mg. was injected into the bursa and relief of pain followed, this lasting for from 1 to 6 months.

Plantar Fasciitis

This is a common cause of painful heel. The patient complains of pain in the ball of the heel on standing and walking. Tenderness is present on the plantar aspect of the heel and especially on the inner side near the attachment of the plantar fascia to the medial process of the tuberosity of the os calcis. In these cases I have injected hydrocortisone into the heel pad, the needle being inserted into the inner aspect of the heel and directed towards the site of attachment of the plantar fascia. Relief of symptoms has occurred

in about half the cases. Crisp and Kendall (1955) report success in about 40 per cent. of cases. Failure may occur because the hydrocortisone does not reach the lesion, which may be quite small as in Tennis Elbow. In view of the ineffectiveness of other methods of treatment however, hydrocortisone injections are certainly worth a trial.

Lesions of Tendons and Tendon Sheaths

Stenosing tenosynovitis or De Quervain's disease is frequently responsible for pain in the region of the wrist joint. The synovial sheath containing the tendons of abductor pollicis longus and extensor pollicis brevis is most often affected, but analogous stenosis has been described in other tendon sheaths at the wrist and ankle. When the sheath of abductor pollicis longus is involved the patient complains of pain in the region of the radial styloid. The pain is felt on active abduction and extension of the thumb, and it may radiate upwards towards the elbow or downwards into the thumb. Intense pain is caused by flexing the thumb into the palm followed by forced ulnar flexion of the wrist. Thickening of the sheath is sometimes so marked as to be clearly visible in the region of the radial styloid, and in most cases it is palpable. Tenderness is present over the sheath at the radial styloid. This condition can be satisfactorily treated by making an incision into the thickened sheath, and until recently other methods of treatment have usually been unsuccessful. Christie (1955) in a controlled trial showed that one injection of hydrocortisone relieved the symptoms in 70 per cent. of cases for periods exceeding three months. In the remaining 30 per cent. of cases relief was obtained but relapses occurred a few weeks after the injection. Relief could be obtained again by further injections but when relapses were observed repeatedly surgical treatment was considered advisable. The following injection technique has been found satisfactory. The needle, attached to a syringe containing 2 per cent. procaine, is inserted into the skin about 1 cm. distal to the tip of the radial styloid in the line of the tendon of abductor pollicis longus, and is directed upwards over the radial styloid so as to enter the tendon sheath. The contents of the syringe are then discharged, this producing a longitudinal swelling which indicates that the fluid has entered the sheath. The syringe containing procaine is then replaced by one containing hydrocortisone and 25 mg. of the latter is injected.

Traumatic Tenosynovitis

This is seen frequently in the tendon sheaths near the wrist and ankle. The patient complains of pain over the affected sheath and examination reveals crepitus on movement. An injection on

25 mg. hydrocortisone into the tendon sheath relieves the symptoms, often permanently, but relapses may occur requiring further injections.

Trigger Finger

This is a condition in which movement of the finger is hindered by thickening of the flexor tendon or its sheath usually at the level of the metacarpophalangeal joint. The finger tends to stick in flexion, and extension is only possible with assistance, a distinct jerk occurring as the obstruction is overcome. An injection of 12.5 mg. of hydrocortisone into the tendon sheath results in relief of symptoms within a week.

Simple Ganglion

Reports on the treatment of simple ganglion with hydrocortisone are conflicting and I have no personal experience of it. Howard *et al.*, (1953) state that no improvement occurred in five cases following injection of hydrocortisone into ganglia. Becker (1953) gives some interesting figures on the treatment of simple ganglion. Before hydrocortisone became available 47 patients were treated conservatively, and in a third of the cases the ganglia disappeared. Fifty-four patients were treated surgically but the ganglia later reappeared in a third of the cases. In 26 out of 30 patients receiving local hydrocortisone the ganglia disappeared and there was no recurrence.

Miscellaneous Soft Tissue Lesions

Following an injury painful tender areas in musculo-tendinous regions, tendon insertions and ligaments are frequently found. An injection of hydrocortisone into such tender areas often produces a striking relief of symptoms. In a few patients chronic pain in the hip region is associated with an acutely tender area near the great trochanter. This may be due to calcareous tendinitis similar to supraspinatus tendinitis or to gluteal bursitis. Treatment of this lesion with hydrocortisone locally is often successful. It must be borne in mind however, that gluteal bursitis may be tuberculous and hydrocortisone would then be contra-indicated. Patients complaining of pain in the knee are occasionally found to have an acutely tender area in the periarticular soft tissues especially near the internal lateral ligament. Injection of hydrocortisone into such tender areas is worth a trial and quite often results in complete relief of symptoms. I have injected tender areas in the lumbo-sacral region in cases of low back pain but the results have been disappointing.

Dupuytren's contracture has been treated with hydrocortisone injections. Coste (1953) treated ten patients and considered that slight improvement

occurred in early cases. Howard *et al.*, (1953) considered that it was of some value as an adjunct to surgery in the treatment of Dupuytren's contracture.

Badner *et al.*, (1953) have injected hydrocortisone into the fibrous plaques in the penis in Peyronie's disease and noted improvement in 16 out of 17 patients so treated.

Conclusion

Hydrocortisone injected locally often relieves symptoms in a variety of painful soft tissue lesions. The drug is particularly valuable in the manage-

ment of tennis elbow, periarthritis of the shoulder and tenosynovitis including De Quervain's disease.

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