ASPIRATION AND INJECTION OF JOINTS (1)

Therapeutic injection of joints and periarticular structures is simple: the ability to perform this procedure as primary care may save the patient needless waiting for hospital appointments. Examination of synovial fluid for diagnostic purposes in patients with unexplained or acute synovitis may be vital: familiarity with the technique will increase the likelihood of obtaining such fluid.

Indications

- (1) Diagnostic aspiration in cases of suspected septic arthritis, crystal-induced synovitis, and haemarthrosis.
- (2) Therapeutic aspiration for tense effusions, septic effusions, and haemarthrosis.
- (3) Therapeutic injections of corticosteroids for persistent localised synovitis or soft-tissue lesions.
- (4) Introduction of contrast media for diagnostic arthrography.

Cautionary considerations

Frequent use of steroid injections in weight-bearing joints, particularly in osteoarthritis, is not recommended, and the interval between injections should not normally be less than three months. The patient should be warned not to be overenthusiastic in using the joint in the 24 hours after injection.

If septic arthritis is possible or the joint fluid is purulent, steroids should not be injected until negative bacterial cultures have been obtained. The possibility of tuberculosis as a cause of "synovitis" should be considered, particularly in immigrants.

Iatrogenic infection is rare with disposable syringes and needles, and the risk is minimised by a careful sterile technique. The patient should nevertheless be warned to seek medical advice for increased pain or swelling after intra-articular injections. Certain soft-tissue injections, particularly for tennis elbow and painful arc shoulder, may cause increased pain for a day or two afterwards, and the patient should be warned of this before injection.

Materials for injection

Use lignocaine or Xylocaine (without adrenaline) 1-2%. We usually use hydrocortisone acetate injection and reserve the longer-acting, more expensive preparations (for example, methylprednisolone acetate and triamcinolone (hex) acetonide) for patients in whom hydrocortisone acetate is only briefly effective or for small joints. Because of the risk of atrophy of the skin and subcutaneous tissues hydrocortisone acetate is preferable for soft-tissue injection. Multidose containers should be used only if you are the sole user.

General procedure

Diagnostic aspiration or injection is much easier when appreciable swelling is present, as less precision is required in placing the needle. Before starting, carefully feel the bony margins of the joint space. Use the thumbnail to mark the joint space, and if in doubt move one bone so that you can feel its movement on one side of the joint. Check that you have easily available all you need: choice of needles and syringes, local anaesthetic (or saline), requisite specimen containers, and, for large effusions, a jug or basin nearby. For aspiration followed by injection draw up the steroid beforehand and make sure the needles are not too tightly jammed on the syringes.

Prepare the skin carefully with chlorhexidine in 5% spirit or surgical spirit—not Savlon. A rigorous no-touch technique is for the experienced and for simple injections; sterile gloves, a sterile pack, and a generous area of prepared skin for the less experienced. With experience it is rarely necessary to use local anaesthetic, and a subcutaneous bleb is usually sufficient. Local anaesthetic in the syringe is useful when difficulty in entering the joint is expected or to clear the needle and check that there is free and easy flow once the joint is entered.

In joint aspiration the needle size is important. For thick, purulent or chronic effusions a white (19-gauge) needle is usually needed, otherwise a green one (21) will suffice. For finger and toe joints use a blue (23) needle, which is usually used for injecting small quantities.

When effusions are purulent send specimens for microbiological examination and measurement of protein and glucose concentrations (in a small fluoride container), and a heparinised sample for cytology and crystal examination. Identifying crystals requires some experience, and at night it may be best to keep a sample refrigerated to be re-examined the next morning.

Ankle joint

With the foot slightly plantar flexed, palpate the joint line anteriorly between the tendons of extensor hallucis longus laterally and tibialis anterior medially just above the tip of the medial malleolus. Direct the needle slightly sideways, backwards, and upwards. Fluid may be aspirated if there is an effusion. Hydrocortisone acetate 25 mg is appropriate.

Knee

The patient should be as comfortable as possible, lying down with sufficient pillows. The knee may be slightly flexed and muscles relaxed. Palpate the posterior edge of the patella medially or laterally and move the patella gently sideways to feel the femoral surfaces below. The patient should be sufficiently relaxed that the patella can be moved freely; otherwise, aspiration is virtually impossible. Maintain a gentle conversation rather than grim silence. Insert the needle horizontally or slightly downwards into the joint in the gap between patella and femur; once behind the patella it must be within the joint. A slight resistance may often be felt as the needle goes through the synovial membrane. If no fluid can be aspirated check that the patient's quadriceps muscle is relaxed and that the needle is not blocked by injecting local anaesthetic. If this flows freely the needle is intra-articular. One last trick is to rotate the needle, as a synovial villus or fibrin body may be against the bevel.

Small effusions may sometimes be found in the medial or lateral pouches, and fluid will appear in the syringe as the needle is withdrawn very slowly with negative pressure. Once the correct position is found, rest the hand holding the syringe against the patient's leg. The usual dose is 50 mg hydrocortisone acetate to 40 mg methylprednisolone and 20 mg triamcinolone (hex) acetonide. If injecting steroid do not completely aspirate the joint, so as to permit free diffusion of steroid around the cavity.

Prepatella bursitis—Several bursae are present on the lower surface of the patella and patellar tendon. While bursitis will usually respond to using a kneeling pad, some cases are sufficiently painful to warrant injecting 25 mg hydrocortisone acetate into the most tender area.

Shoulder

The shoulder joint is most easily entered anteriorly: this route is used for aspiration, frozen shoulder, and synovitis. With the patient seated and his arm relaxed against the side of the chest, feel for the space between the head of the humerus and the glenoid cap, about 1 cm below the coracoid process. If in doubt, rotate the humerus by moving the extended hand outwards and feel the head moving under the fingers. Insert the needle into the space with a slight medial angle. It should enter the joint easily, almost to the length of a green needle. The usual dose is 25-50 mg hydrocortisone acetate.

The lateral approach is used mainly for subacromial bursitis or the painful arc syndrome. Feel for the lateral tip of the acromium and insert the needle just below it in a medial direction with a slight downward slant until the tip reaches the humeral head. Gradually withdraw the needle with gentle pressure on the plunger: when the needle point is in the subacromial bursa a sudden drop in resistance will be felt. Injection will often reproduce the symptoms of the painful arc syndrome; if it does not, angle the needle in different directions until the pain is reproduced. Mixing local anaesthetic with the steroid is a useful diagnostic test, as the shoulder movements (or symptoms) should be improved after a few minutes. A second injection after a few days is often required.

Bicipital tendinitis is one cause of shoulder pain and is detected by finding tenderness over the tendon when the arm is externally rotated. Insert the needle almost parallel to the tendon—if it enters the tendon there will be resistance to the injection—then withdraw slightly and inject 25 mg hydrocortisone acetate into the tendon sheath and 25 mg direct into the shoulder joint, as part of the tendon is intra-articular.

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