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SYNOVIAL FLUID ASPIRATION

Indications

Examination of synovial fluid is indicated in the investigation of chronic joint pain or distention to differentiate inflammatory from degenerative arthropathies and in the detection of neoplastic disease. Examination is also indicated in cases presenting with multiple joint involvements, suspected Lymes disease, immune mediated disease and in cases of shifting lameness, even when joint distention is not a clinical feature.

Restraint

Requirements will vary dependent upon the extent of joint pain, the joint to be sampled and the tractability of the patient. In many cases sedation/general anaesthesia +/- analgesia is required.

Equipment

- 1" 20-22 gauge needle.
- 2-5 ml syringe.
- Clean glass slides.

Approach to the common joints

Full surgical field preparation is recommended. The patient is positioned in lateral recumbency with the affected joint uppermost.

Hip joint:
Two approaches are possible**:**

Lateral approach: with the leg slightly abducted and rotated outwards, insert the needle cranially to the greater trochanter, then advance medio-ventrally, taking care to avoid the circumflex femoral artery and the sciatic nerve (caudally).

Ventral approach: In dorsal recumbency abduct both femurs at an almost 90 degree angle. Insert the needle in the ileopectineal eminence of the pelvis, just caudo-lateral to the origin of the pectineus muscle, then advance caudo-cranially at a 45° angle.

Stifle joint:
With the joint slightly flexed, insert the needle midway between the patella and the tibial tuberosity, on the opposite side of the straight patellar ligament (palpable on the medial aspect), then direct it obliquely and distally toward the intercondylar space of the tibia.

Hock joint:
With the joint slightly flexed, insert the needle in the cranio-lateral aspect of the palpable space between the distal fibula and tibia then advance in the joint directing the needle distally following the calcaneus.

Shoulder joint:
With the joint slightly flexed, apply distal traction whilst rotating outwards. Insert the needle between the greater tubercle and the acromion process of the humerus and then advance it obliquely ventro-caudally to pass through the muscle layer.

Elbow joint
With the joint flexed to 45°, insert the needle between the lateral condyle of the humerus and the triceps tendon (caudo-lateral aspect). Then advance it downwards and slightly medially along the cranio-lateral aspect of the olecranon into the supratrochlear foramen of the humerus.

Antebrachiocarpal joint
In lateral or sternal recumbence, flex the carpus completely and insert the needle between the tendons of the extensor carpi radialis and the common digital extensor tendon (cranial aspect).

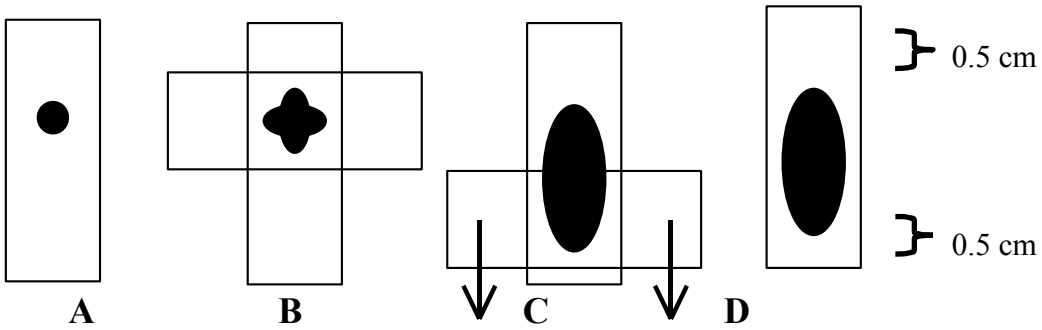
Sample Collection

Palpation of the joint during manual flexion and extension may help to identify the joint space. The needle should be advanced gently toward and through the joint capsule avoiding damage to ligaments or the articular cartilage. Once the needle has been positioned gentle negative pressure should be applied and the sample observed as it enters the syringe.
It is important to record the gross appearance of the fluid during collection on the sample request form to aid differentiation of iatrogenic blood contamination during sampling from prior haemorrhage.
The volume that can be obtained will vary with the site of collection and the size of the patient. It is preferable to collect a smaller volume of relatively uncontaminated sample rather than a larger sample with blood contamination.

Sample Submission

- A volume of fluid should be transferred in an EDTA tube as soon as possible and the sample thoroughly mixed.
- In addition to the EDTA sample, **1-2 unstained glass slides** prepared by squash technique (see figure 1 below) should be submitted in a plastic slide transporter (available from the laboratory upon request). When the smears have been made they should be rapidly dried. The airstream from a hairdryer is suitable for this. Air (warm/cool but not hot) should be directed onto the back of the slide from a distance of 6-8 inches.
- To preserve the cellular morphology, when enough fluid has been withdrawn, inclusion of a second EDTA sample **promptly** fixed with the addition of two drops of 10% buffered neutral **formal saline** (as supplied in our histopathology pots) per ml of fluid, and labelled accordingly is recommended. This will be processed separately and stained with a modified Papanicolaou stain, which greatly improves the diagnostic yield.

Fig 2: Squash preparation of slide



A small amount of the sample is placed on one slide and a second slide placed on top. The second slide may be perpendicular or parallel to the first. The material will spread between the two slides (**Figure 2a**). If necessary, very gentle pressure may be used to facilitate spreading (**fig. 2b**) and the top slide is gently pulled across the bottom until the two slides are separated (**fig. 2c**). The slides should slide apart, and should not be lifted away from each other (**fig. 2d**).