**ARTHROCENTESIS AND SYNOVIAL FLUID ANALYSIS**

**IN THE EMERGENCY DEPARTMENT SUMMARY HANDOUT**

Indications

* Suspicion of septic arthritis
* Suspicion of crystal induced arthritis
* Unexplained arthritis with synovial effusion
* Relative: therapeutic (decrease intra-articular pressure, injection of anesthetics/steroids)

Contraindications

* No absolute contraindications for diagnostic arthrocentesis
* Do not inject steroids into a joint that you suspect is already infected
* Relative Contraindications:
  + Overlying cellulitis
  + Coagulopathy
  + Joint prosthesis (refer to ortho)

Patient education

* Discuss risks of iatrogenic septic joint and damage to neurovascular structures. With therapeutic steroid injections discuss risks of flushing, post-injection flare, and hypopigmentation.

Procedure

* Prep and drape the area in sterile fashion. Use lidocaine for local anesthesia. An 18ga needle is used for larger joints.
* Be familiar with common approaches for different joints
  + Knee
  + Ankle
  + Shoulder
  + Wrist
  + Hand
  + Elbow
* Ultrasound can be used to assist in identification of joint effusion and arthrocentesis

Pathological conditions

* Noninflammatory: osteoarthritis, trauma, avascular necrosis, Charcot’s arthropathy, hemochromatosis, pigmented villonodular synovitis
* Inflammatory: septic arthritis, crystal-induced arthritis, rheumatoid arthritis, juvenile idiopathic arthritis, spondyloarthritis, systemic lupus erythematosus, lyme disease

Synovial fluid analysis

* Note clarity, color and viscosity. Send synovial fluid for cell count with differential, gram stain, culture, and crystal analysis. See **Table 1.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Synovium** | **Normal** | **Noninflammatory** | **Inflammatory** | **Septic** |
| Clarity | Transparent | Transparent | Cloudy | Cloudy |
| Color | Clear | Yellow | Yellow | Yellow |
| WBC | <200 | <200-2000 | 200-50,000 | >**1,100 (prosthetic joint)**  >25,000; LR=2.9  >50,000; LR=7.7  >100,000; LR=28 |
| PMN | <25% | <25% | >50% | >64% (prosthetic joint)  >90% |
| Culture | Neg | Neg | Neg | >50% positive |
| Lactate | <5.6 mmol/L | <5.6 mmol/L | <5.6 mmol/L | >5.6 mmol/L |
| LDH | <250 | <250 | <250 | >250 |
| Crystals | None | None | Multiple or none | None |

**Table 1.** Synovial fluid analysis for the listed pathologies. LR = likelihood ratio