433 Teams

ORTHOPEDICS

Skills 2

Knee Aspiration

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Objectives:

- To be able to perform knee joint effusion aspiration properly with no or minimal risk of complication(s)
- To be able to differentiate between different appearance and consistencies of the synovial fluid

Resources:

- Knee aspiration hand out
- Doctor's notes
- 432 team work

Indications:

A. Diagnostic

- Diagnosis of suspected septic arthritis. Rule out infection like septic arthritis, subacute or chronic arthritis
- Rule out inflammatory causes (Rheumatoid arthritis, Reactive synovitis)
- Identification of crystal arthropathy.
- Traumatic causes (intra-articular fracture →bleed →hemoarthrosis)

B.Therapeutic (Rare)

- Relief of pain by aspirating effusion or blood .
- Injection of medications.

Contraindications:

Relative contraindications include the following:

- Cellulitis overlying the joint.
- Uncontrolled coagulopathy.

Equipment:

- Sterile gloves and drapes
- Gauze pads, 4 × 4 in.
- Skin preparatory solution (alcohol or chlorhexidine)
- Lidocaine 1%.
- Syringes: 60 mL.
- Needles 18 gauge, patients who are morbidly obese might require a 21-gauge spinal needle for arthrocentesis.
- Specimen tubes, blood culture tubes: specimen will be sent for (cell count, Gram stain, AFB, aerobic and none aerobic cultures, fungal, TB cultures and crystals)
- Bandage.

Before The Procedure:

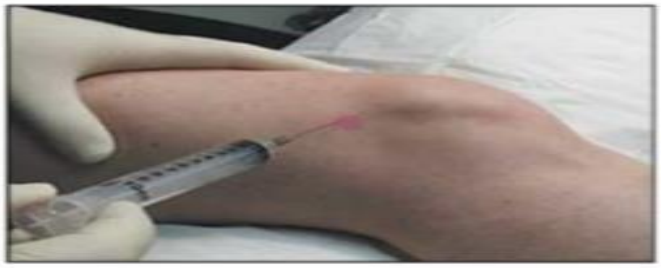
- Introduce your self and explain the procedure.
- A written consent should be taken from the patient or guardian.
- Wash your hands and check your equipment (sterile gloves and cleaning set, antiseptic solution, syringe, local anesthesia).
- Identify the boney landmarks of the knee joint.
- Possible entry points: joint line or supra patellar pouch.
- Patient Preparation:
  - Patient should be exposed from the mid thigh to the foot, supine in bed and a small cushion under the knee to flex it (30°).
  - Adult patient should be relaxed.
  - For pediatric patient, it should be done in operating room or under conscious sedation.

During The Procedure: (under aseptic conditions)

- Clean the area 3 times (in out) with alcohol and put drape on knee
- Inject 3-5 cc local anesthesia in the subcutaneous tissue, inject it in three directions (in each direction you have to aspirate before if you do not see blood inject + while injecting withdraw the needle to anaesthetize the whole area)
- **Wait for 2-3 min** (in the exam just mention it)

Approach: Lateral Suprapatellar approach.

- Remember that in 10% of the population, the suprapatellar bursa does not communicate with the knee joint.
- For large effusion.
- Insert the needle **1 cm above and 1 cm lateral to the superior lateral aspect of the patella at a 45-degree angle.**
- While inserting the needle aspirate at the same time until you see fluid , stop inserting the needle and keep aspirating.



- Cover and bandage the aspiration site.
- Send the fluid for culture and analysis.

After The Procedure:

- Advise the patient to rest the joint for 1-2 days and to avoid strenuous use for five days (rest the joint).
- Warn the patient that the joint may be painful for a while and advise on use of analgesics.
- Following injection, patients should be warned that they might experience worsening symptoms during the first 24-48 hours (related to a possible steroid flare) which can be treated with ice and NSAIDs. If pain is severe or increasing after 48 hours, seek advice.
- Warn about possible other side-effects. Advise to seek help if systemic side effects develop suggesting infection.
- Arrange appropriate follow-up.

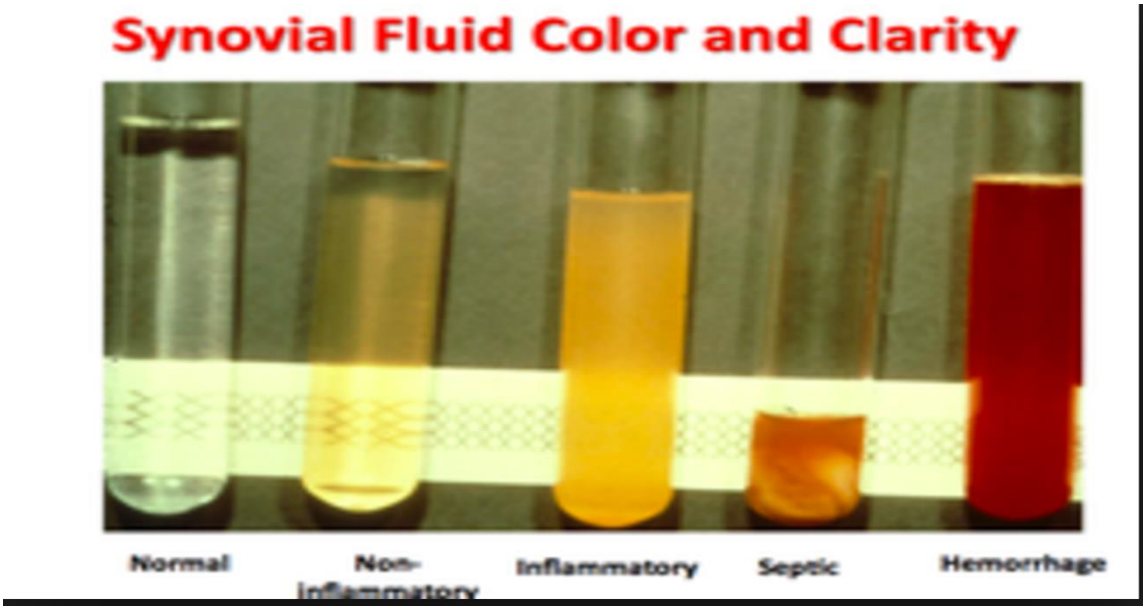
Comment on the aspirates:

Remember to comment on:

- Amount (Large or small)
- Color (clear, Straw color)
- Consistency any content (Blood or Fat droplet)
- Viscosity (thick)

Possible scenarios for knee aspirates:

- Thick pus **(septic arthritis)**: patient must be admitted for emergency knee joint washout and Intravenous broad spectrum antibiotic therapy
- Blood **(heamarthrosis)**: if no fracture, same advices as for therapeutic arthrocentesis.
- Blood and fat droplet **(fracture is present)**: should be managed as fracture principles.
- Straw color fluids **(crystal induced arthritis vs rheumatological cause)**: fluid must be sent for same cultures as mentioned before with stress on crystal under light microscopy.



Synovial Fluid Analysis

	WBC/mm³	Color	Viscosity
Normal	< 150	Colorless/Straw	High
Noninflammatory	< 3,000	Straw/Yellow	High
Inflammatory	> 3,000	Yellow	Low
Septic (purulent)	> 50,000	Pus/Mixed	Mixed
Hemorrhagic	Similar to blood	Red	Low

Done By:	**Rahma alshehri**
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