Table of Contents

EQUIPMENT 2

PERSONNEL 2

CONSENT AND ADVERSE EVENTS 2

BIOPSY PROCEDURE 3

ORIENTATION OF PATIENT 3

PREPARATION 3

PROCEDURE 4

POST PROCEDURE CARE 4

TISSUE SAMPLES 4

Histological evaluation 4

Gene microarray analyses 4
1. EQUIPMENT

- Quick-Core biopsy needles (16/14G)
- 21G / 19G needles
- Sterile drapes
- Sterile Ultrasound sheath
- Sterile gown and gloves
- Procedure pack
- Face mask / hair cover
- Sterile swabs
- Antiseptic solution (Chlorhexidine 2%)
- 10mls / 20mls syringes
- 1 % Lignocaine (20-30mls)
- Non-adhesive dressing
- Sample container for processing

2. PERSONNEL

- Ultrasonographer performing the biopsy
- Technician / nurse / clinical fellow for tissue processing

3. CONSENT AND ADVERSE EVENTS

Consent should be gained prior to the patient attending for the synovial biopsy. This can ideally be done during clinic when the patient’s permission to perform the biopsy is initially sought.

There are no large prospective studies of complication rates for Ultrasound (US) guided synovial biopsies using this particular technique. Our own experience would suggest that this procedure is well tolerated and safe. We have listed the quoted complications for diagnostic arthroscopy, however we expect the complication rate for this procedure to be significantly better.

Approximately 25% of patients will have minor discomfort after the procedure. This is effectively managed with simple analgesia (non-steroidal anti-inflammatory drugs / Paracetamol) and should dissipate after 24hrs. Patients are able to walk after the procedure and can go home on the same day. Patients are asked to refrain from over exertion and should ideally be accompanied home by a friend / relative.

Below is a list of most commonly experienced complications with arthroscopic procedures (approximate incidences in brackets).

i) JOINT INFECTION (0.2%)  
ii) DEEP VENOUS THROMBOSIS (0.2%)  
iii) HAEMARTHROSIS (1%)  
iv) NEUROLOGICAL DAMAGE (0.02%)  
v) WOUND INFECTION (0.5%)  
vi) THROMBOPHLEBITIS (0.08%)

Patients be given a contact telephone number if they have any concerns following the synovial biopsy, specifically if there is pain, swelling, warmth or redness from the joint which may indicate infection.
4. BIOPSY PROCEDURE

4.1. ORIENTATION OF PATIENT

- The patient should be placed supine on a bed. The patient may remain recumbent at 45 degrees or preferably lie flat during the procedure, with the knee slightly flexed (25-30 degrees) to improve imaging of the supra-patella pouch.

4.2. PREPARATION

- With the patient suitably placed on the bed, suitable absorbent pads should be placed under the knee. The skin should be prepped with appropriate sterilization fluid. A wide field should be sterilized in excess of the immediate area of interest, approx. mid-thigh to mid calf both anteriorly and posteriorly.

- Sterile drapes should be positioned above, below, medial and lateral to the knee leaving sufficient space for access to the supra-patella pouch and placement of the U.S. probe for the purposes of imaging.

- The operator should now evaluate his equipment tray including biopsy needle and commence personal preparations for the procedure (hand washing, gloves, face mask, hair net, sterile gown).

- The US probe should be placed within the sterile sheath. US gel should be placed first upon the probes foot-print and slowly lowered into the sheath. The upper end of the sheath should be secured with a sterile tie or elastic band usually provided with the sheath.

- 10mls of 1% lignocaine should be aspirated into a syringe containing 10mls of normal saline. This mixed solution will be introduced into the synovial space later.

- US examination of the lateral aspect of the knee should indicate a suitable area for needle insertion distal to the vastus lateralis muscle insertion into the patella (see diagram below).

Figure 1: Cartoon of the lateral aspect of the right thigh and knee
4.3. PROCEDURE

- Inject the 5-10mls of 1% lignocaine into the subcutaneous and deep tissue at the predetermined point of insertion as identified by the initial US scan. Leave a minimum of 5 mins for effect.
- Using a 19G needle and under US guidance, aspirate as much fluid as possible from the supra-patella pouch. This should be stored for analysis. Disconnect the syringe leaving the needle in situ. Now introduce the 20mls mix of normal saline and lignocaine. This will enable a better image to be acquired during the procedure and facilitate clear identification of synovial tissue. This step may be altered according to the size of the patient and volume of synovial fluid present. Smaller amount of normal saline and lignocaine may be used.
- The quick core biopsy needle should be primed before its introduction to the synovial space.
- Introduction of the biopsy needle into the supra-patella pouch can now be performed under ultrasound guidance.
- The needle should be extended and the throw identified on the US images (Figure 2). The throw of the needle should be placed against the surface of the synovium to maximize the opportunity for capturing the lining layer. Gentle pressure should be placed on the needle to oppose the throw and synovium. Triggering of the needle mechanism should be performed with a small forward movement of the whole needle. NOTE: if the tip of the extended needle is abutting a boney surface, backwards movement of the needle will occur at this stage with poor retrieval of tissue.
- After sufficient numbers of specimens have been harvested, any remaining fluid should be aspirated.

4.1. POST PROCEDURE CARE

- A small dressing can be used to cover the wound. No compression bandaging is required but this is at the discretion of the attending physician.
- A Neurovascular assessment should be made of the limb.
- The patient should remain in the department for a minimum of 30 mins post procedure. No specific monitoring is required.
- Contact details in case of complications should be provided to the patient.
- It is recommended that patients are followed up 3-5 days following the procedure either in person or by telephone.

5. TISSUE SAMPLES

Tissue should be collected in the appropriate method for processing as described below.

5.1. Histological evaluation

- 10 biopsies formalin fixed and paraffin embedded
- 6 samples snap frozen.

5.2. Gene microarray analyses

- 6 biopsies immediately immersed in 2.5 ml RNAlater QIAGEN before RNA extraction