

MEDICAL PROCEDURE

SKIN BIOPSY

A.I. Onaga and P.U. Ibekwe

Dept of Medicine, University College Hospital, Ibadan

Introduction

The skin is complex with an array of functions. It is the body's largest organ, undertaking the major physiological functions of regulation of the body temperature, protection, sensation, excretion, immunity and synthesis of Vitamin D. Many skin disorders can be diagnosed through direct observation and palpation but others may require referral to a dermatology specialist or expert. Patients can present with a wide range of skin anomalies. Some of these can prove to be relatively normal, whilst in the extreme, others can be life threatening, making accurate and timely assessment and diagnosis crucial. Investigations are often necessary and may involve a microscopic or histopathological examination of the area of skin involved, or radiological imaging.

Skin biopsy is a procedure where a portion of the skin is removed. This skin sample is examined by the histopathologist, who may provide insight to the likely diagnosis or aetiology of a skin disorder. This information can be obtained by using light-microscopic examination of paraffin-embedded tissue, electron/ultrastructural microscopic examination, immunofluorescence studies and immunohistochemistry. Microbiological studies, tissue culture and molecular biological methods such as *in situ* hybridization and polymerase chain reaction can also be done.

Indications

1. Diagnostic skin biopsy – used to confirm a clinical diagnosis or aid in the establishment of a diagnosis.
2. Excision biopsy – used in the treatment of skin lesions particularly epidermal or dermal neoplasm or to remove lesions for cosmetic reasons.
3. It could also be done in some situations, when a clinical diagnosis is not in doubt, to reassure the patient that the clinician is taking an interest in his or her condition.

Relative contraindications

1. Infants – although local anaesthetic creams/gels make this easier
2. Thrombocytopenia – to avoid uncontrollable bleeding
3. Lower limbs in elderly patients, skin abused with topical steroids – poor healing may occur

4. Upper trunk – to avoid keloid formation

Methods of skin biopsy

1. Elliptical biopsy – Using the scalpel, the skin is cut with the long axis following the natural crease lines of the skin then sutured. This is most commonly used for diagnostic and excision skin biopsy.
2. Punch biopsy – Uses the biopsy punch which is a sharp cutting edge, metal cylinder of variable diameter attached to a plastic handle. Ideal for incision biopsy and excision of very small lesions.
3. Shave biopsy – used in certain superficial benign papular or nodular lesions. Lesions are shaved off with acceptable cosmetic result. Haemostasis is achieved by cauterization or use of aluminium chloride hexahydrate. Recurrence is common.

The following equipment should be prepared

1. Clean dressing trolley or appropriate clean surface.
2. Skin Biopsy Pack or a sterile dressing pack containing sterile non-woven swabs and a sterile towel.
3. Correctly labeled specimen pot containing the appropriate medium. This is decided by the type of investigation required.
4. A sterile occlusive latex free dressing.
5. Wound closure strips.
6. Needles and syringes.
7. Disposable punch biopsy needle if required.
8. Disposable scalpel.
9. Sterile gloves.
10. Disposable plastic apron.
11. Alcohol based antiseptic cleaning solution, e.g. Chlorhexidine Gluconate 0.5%.
12. Local anaesthetic, e.g. Lidocaine 1%. (Lidocaine with Adrenaline (Epinephrine) which is a powerful vasoconstrictor, therefore decreasing bleeding in wounds. However this may be contraindicated in areas of end artery flow i.e., fingers and toes. This can cause palpitations and tremors, so is therefore used with caution.

The procedure

This procedure may be performed on the ward, outpatients or in the operating theatre.

Only a Health Care Professional that has been trained in this skill should undertake the punch skin biopsy.

The type of biopsy, the selection of the site to be biopsied and the type of lesion to be biopsied when

there is a widespread eruption are of utmost importance. Ideally, the lesion biopsied should be an early and untreated lesion which is representative of the skin disorder as a whole. Multiple biopsies are helpful for lesions that present at all stages of evolution and where definite histopathological diagnosis is difficult such as in early cutaneous T-cell lymphoma.

When the lesions are widespread and there is a choice of biopsy sites, it is sensible to avoid areas that will heal badly, and avoid cosmetically important areas. Surrounding normal skin should be included with a diagnostic biopsy so as to observe subtle or gross pathological changes.

Adequate tissue size for the appropriate examination should be biopsied. If a diagnosis of panniculitis for example is being suspected, the sample biopsied should be deep enough to avoid misdiagnosis. The site biopsied should also be well documented since there is regional variation in skin anatomy.

Prior to a skin biopsy, written informed consent should be obtained. One performs a surgical hand wash and puts on the appropriate protective clothing. The biopsy area should be cleaned for 30 seconds with an alcohol based cleansing solution and allowed to dry for another 30 seconds.

Usually local anaesthetic (1% or 2% lidocaine) is injected around biopsy site. Care should be taken not to inject too much to avoid prominent distortion artifact in tissue sections. Topical anaesthetics are helpful with biopsies performed in children. Oral sedation can also be given.

Skin biopsy is a sterile procedure. Caution must be observed by the clinician and direct contact with blood or tissue fluids avoided. Biopsied tissue should be handled with care and taken promptly to the laboratory fixed, usually in 10% neutral buffered formalin. Liquid nitrogen is used for immunofluorescent investigations.

For punch biopsy

Pull the skin around the biopsy area tight.

Introduce an appropriate sized disposable punch biopsy firmly at a perpendicular angle to the anaesthetised area of the skin surface.

The needle punch biopsy should be rotated 360 degrees with the cutting edge carrying the punch down onto the tissue.

The guard on the sterile punch biopsy will prevent too deep a penetration. Withdraw the needle whilst applying pressure on the puncture site with a non-woven swab. This should release the skin specimen.

Remove the specimen using the plastic disposable forceps or sterile scissors.

Specimens taken for rare metabolic disorders should be removed using a disposable scalpel blade and taken from the axilla.

Place the specimen in the appropriate biopsy medium and ensure container is correctly labeled. Apply continuous pressure to biopsy site for 3 to 5 minutes or until bleeding stops.

Post biopsy: Patient is instructed on wound care. Usually the dressing should be kept dry and left in place for 24 hours then changed as needed. Patient should observe site carefully for bleeding or signs/symptoms of infection. Oral analgesia or antibiotics may be required. Sutures are usually removed within a week. The patient and family must be informed of the results of the procedure as soon as possible, although they should be advised that some biopsy results take six to eight weeks depending on the nature of analysis of the biopsy.