SydPath
ST VINCENT'S PATHOLOGY

SKIN BIOPSIES

WHY BIOPSY?

Skin biopsy is a rapid procedure useful in the diagnosis of many neoplastic and inflammatory conditions, and therefore a valuable tool when the clinical differential diagnosis includes different treatment options. Many skin conditions are clinically distinctive, whilst others may require histology for specific diagnosis. At times, however, skin rashes may be both clinically and histologically puzzling and we may only be able to offer a range of possible diagnoses suggested by the histology. The value of the biopsy may be limited by its size, the site selected for sampling, superimposed inflammatory changes, the application of topical agents, or concurrent use of medications. One of the major limiting factors is lack of sufficient clinical information. The histological report is often available 2-3 working days after the specimen is collected, although delays may occur when further investigations, such as special stains, need to be performed, or if further clinical information is required.

WHAT SORT OF BIOPSY?

INCISIONAL BIOPSY

This is preferred by the pathologist as it is orientated and gives more information. It need only be about 6mm long, 2mm wide and 4mm deep. A biopsy for deeper lesions (including panniculitis) will obviously need to be longer and deeper. It should be orientated radially (not tangentially) and should include about 1mm of normal skin.

PUNCH BIOPSY

This is technically easier, but sometimes harder to interpret, as orientation in the laboratory is more difficult. This means that sections cut from the biopsy may not be in the optimal plane, and the lesion may be missed. For this reason, it is better not to include any normal skin in a punch biopsy. There is a preference for 3mm or 4mm punch biopsies rather than 1mm and 2mm, as the latter options may be inadequate.

SHAVE BIOPSY

Shave biopsies and skin currettings are usually successful in diagnosing skin tumours. They fail when the keratin layer is deceptively thick or when the sample is too superficial. This is particularly important in solar keratosis when invasive squamous cell carcinoma cannot be ruled out unless the specimen includes all of the basal layer and a little underlying dermis. We discourage shave biopsies on suspicious melanocytic lesions as critical prognostic information on lesion thickness may be lost.

SELECTING THE BIOPSY SITE

In neoplasms, the thickest region will generally provide the most diagnostic information. In some broad and multifocal tumours, it may be necessary to biopsy several areas, including the centre and periphery of the lesion to make a diagnosis. Site selection is more critical in inflammatory rashes. It is difficult to generalise about which lesion to biopsy, but usually the more florid the lesion clinically, the more pathology that will be revealed. Sometimes biopsying two lesions of different ages is helpful. Blisters and vasculitic lesions must be biopsied at an early stage as their diagnostic features may disappear after about 24 hours.

PIGMENTED LESIONS

The main role of biopsy in these cases is to distinguish between melanocytic tumours and other pigmented lesions such as seborrhoeic keratoses, solar lentigines, basal cell carcinomas, etc. **If a lesion is suspected to be melanocytic (and especially if it is suspicious of melanoma), then complete excision with narrow margins is strongly recommended for the purpose of diagnosis.** This is because biopsies may be misdiagnosed as either benign or malignant. In addition, if the lesion is a melanoma, then important prognostic features may be distorted in the re-excision specimen. Also, if a benign nevus regrows after biopsy, it can develop a pseudomalignant histological pattern, thus risking misdiagnosis of melanoma.

IMMUNOFLUORESCENE

This study is frequently necessary for the diagnosis of blistering/bullous rashes and is also useful in lupus erythematosus and occasionally vasculitis. The specimen must be submitted in an immunofluorescence transport medium which we supply from the laboratory. It must not be placed in formalin. Because this medium is not a good tissue fixative, we also need a biopsy submitted in formalin. It is better to take two separate biopsies rather than divide a single biopsy. In the case of blisters, perilesional skin should be biopsied for immunofluorescence, whilst the formalin fixed specimen should include the edge of a fresh blister and adjacent intact skin (see above 'Selecting the Biopsy Site').

CONSIDER CULTURE

If there is a possibility that the lesion is due to an infection, take a swab of the biopsy wound or even send a small piece of tissue for culture (put it in a sterile jar with a small amount of sterile normal saline and send it to the lab as soon as possible). Do not divide a biopsy specimen.

FLOW CYTOMETRY

If the lesion is suspected of being a lymphoma deposit, flow cytometric analysis of lymphoid cell markers can be useful to demonstrate clonality. An additional biopsy will need to be submitted in RPMI medium (available from the laboratory).

NOTES FOR SKIN BIOPSIES

- Carefully select the biopsy site so that it is representative of the lesion or rash. Consider more than one biopsy.
- Mark the biopsy site prior to performing the procedure.
- Be gentle with the specimen to avoid crush artefact.
- Consider special investigations such as immunofluorescence and culture. Send separate specimens for different tests – do not divide biopsies.
- The major role of biopsy in pigmented lesions is to confirm the clinical diagnosis of a pigmented, nonmelanocytic lesion. If a lesion is thought to be melanocytic, and especially if it is atypical, then narrow, but complete excision rather than biopsy is strongly recommended.
- Take the time to write clinical notes and a provisional diagnosis.

TECHNICAL DETAILS

WHAT TO CALL YOUR SPECIMEN

The pathologist performing the macroscopic examination needs to know whether a piece of skin this shape is an excision biopsy or an incision biopsy.

Most specimens require division before being processed.

A piece of skin this shape

may be divided this way if it is a small incision,

Or this way if it is a large incision,

as these transverse sections will display the margins of excision in relation to a tumour. If, however, it is an incision specimen, it will remain whole so that sections display the full length of the specimen. If it is more than 3.0mm wide, it will be divided longitudinally:

For technical reasons we slice our tissue blocks to about 3.0mm thickness. To avoid a good incision biopsy being partly wasted or an excision biopsy that cannot be assessed for completeness of tumour removal, please specify excision or incision biopsy.

CLINICAL NOTES

A clinical description (including clinical diagnosis or differential) is frequently useful in the diagnosis of tumours and is usually essential in the diagnosis of rashes. Information should include:

- Exact site - Size - Duration
- Symptoms - Drugs - Appearance
- Clinical diagnosis or differential diagnosis

SELECTING THE BIOPSY SITE

	Incision Biopsy	Punch Biopsy
Blotchy, macular		
Annular	show centre, edge and normal	Sometimes unsuitable for punch
Discoid, plaque		
Papular		
Vesicular, bullous	Show edge & normal	Unsuitable for punch
Nodule, tumour		

HOW TO BIOPSY

1. Mark the Site

Select and mark the site(s) to be biopsied. An ink marker is useful.

2. Skin Preparation

Be thorough but gentle, so that no scale or scab is rubbed off. Allow alcohol to dry before starting a biopsy.

3. Local Anaesthesia

1 or 2% lignocaine with 1:100 000 adrenaline is suggested.

NOTE: Adrenaline should not be used in certain sites. Do not inject anaesthetic directly into the biopsy site as this will introduce artefacts.

4. Punch Biopsies

Stretch the skin between index or middle fingers, or thumb and index finger of one hand, and press the punch in, rotating as you press until you feel it pop through the dermis into the subcutaneous fat. Remove the punch and separate the biopsy from the surrounding skin at the level of the fat using scissors or a scalpel blade. If the biopsy retracts into the skin, then gentle pressure on either side of the site will usually pop the biopsy core into view. Be gentle with the biopsy and never grasp it with non-toothed forceps as this will crush artefact and may render the biopsy useless. Use fine toothed forceps, a skin hook or a needle. Stretching the skin will produce an oval rather than a round hole, and one suture will repair the site.

5. Incision Biopsies

Make a vertical elliptical incision about 2-3mm wide and down to fat. Try not to undercut the edges. Grasp the biopsy by the deep edge using a skin hook or fine single tooth forceps and free the base of the biopsy with curved scissors or scalpel dissection. Repair with sutures.

6. Afterwards

Place the biopsy in formalin. If necessary, submit further biopsies fresh for culture, in immunofluorescence transport medium for immunofluorescence (or in RPMI medium for Flow cytometry sent out by the laboratory on request). Label the specimen, and please write some clinical notes on the pathology request form.