

Improving the results of surgical excision of skin lesions

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Introduction

The purpose of this review is to look at the ways to improve the scarring of the wound after an excision. The scar that is left on the patient is a permanent record of our procedure. The scar will be used as a measure of the quality of the procedure, to a greater or lesser degree.

With the increasing funding pressures on secondary care in New Zealand, more minor problems do not qualify under the present points-based booking system. There is an increasing need for general practice to meet these demands by providing minor surgical services.^{1,2}

The opportunity for general practice to provide increased minor surgical services has been formally recognised by some IPAs, for example ProCare Health Limited, which has developed minor surgical training courses for their GPs and standards for infection control. Minor surgery is a practical skill that requires theoretical knowledge as well as practice to improve the quality of the outcomes.

Patient expectations

It is important that time is spent in the preoperative consultation to ensure that the patient's expectation of what they think the outcome will be is aligned with what we will be providing as the operating doctor.³ Explain to the patient that there will be a scar, so that they expect one. Some areas are worse than others for scar

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stretching, e.g. the back and shoulders, so make this clear at the beginning. Tell them that the scar will continue to improve after the sutures have been removed, as the scar goes through a healing cycle, which can take up to six to nine months to complete. Some areas, such as the sternum, have a high risk of developing hypertrophic scarring so the benefits

of the excision have to clearly outweigh this risk.⁴

Excision lines

Carefully choose the lines of excision as the scar will have significantly less tension if the excision lines are

parallel with the natural skin tension lines.

Determining the skin tension lines

There are a number of methods that can be used to determine the tension lines and usually it is best to use different combinations in different areas of the body.^{7,10}

- Natural skin creases/wrinkles^{5,7} – especially on the face.
- Hair follicle alignment as they run with the skin tension lines.⁷

- Pinch test (relaxed skin tension lines)^{6,7} – the skin adjacent to the lesion to be excised is gently pinched together to allow the skin to relax and naturally crease. The creases will run with the direction of the skin tension lines.
- Langer's Lines^{7,8} – these are a map of the skin tension lines in cadavers after they were punctured with a circular instrument. The skin tension then distorted the circles into elliptical defects, with the long axis running in the direction of the skin tension.
- Flint Circles⁹ – this method was developed by, and named after, a New Zealand plastic surgeon, Dr M Flint.

Flint Circles makes use of the fact that our skin is laid on our bodies in the foetal position, so if circles are marked on the skin surface in this position they will become ovals when the person assumes an erect posture. The long axis of the oval will be in the direction of the lines of skin tension. I find 'Flint Circles' very useful on the limbs and back. All that is needed to make the circles is a stamp pad and anything that will make a circle with a diameter of around two to three centimetres (e.g. peak flow meter mouth-piece).

Once the best orientation for the excision has been determined, the elliptical lines for the excision should be marked out with a surgical marker. The long axis should be parallel with the chosen skin tension line. The length of the ellipse should be approximately three times the width.^{5,10}

Making the excision

Before the lesion is excised it is worth assessing if the resulting defect can be closed with acceptable tension. Excessive tension on closure is an important determinant of the ultimate appearance of the scar. If suturing directly will be tight then consideration should be given to alternatives, such as using a flap, Wolfe graft or referral to another doctor if you are not able to perform more complex closure techniques.

A number '15' scalpel blade should be used for most skin excisions.^{10,19} The number '11' blade is too pointed and therefore much more difficult to

control. The 'belly' of the number 15 scalpel blade is used to make the incision which should be vertical through the epidermis and dermis into the subcutaneous fat. The elliptical skin specimen can then be removed by lifting one end of the ellipse and bevelling the scalpel toward the centre of the specimen and cutting from each side.

Do not forget to send the specimen for histology.

Preparing the wound for closure

Good haemostasis is required before the wound is closed.^{10,16} If the bleeding is not stopped before closure a haematoma may develop under the skin in the subcutaneous tissue which will greatly increase the risk of a wound infection. If you do a lot of

minor surgery then a radiosurgitron is probably the most cost effective device on the market now and is superior to the older

style hyfrecator. If you do infrequent skin surgery then battery powered portable cautery devices may be adequate for your use.

If there is a lot of tension at the skin edges some undermining may be required to assist in approximating the edges.¹⁰

Suturing the wound

The defect should be closed in two layers. A deep layer followed by the skin layer. This will reduce the tension on the skin edge and reduce the risk of stretching in the scar to keep the scar line as thin as possible.^{10,11,12,13}

The deep layer should be closed with an inverted suture of absorbable

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suture material, e.g. vicryl or dexion. The inverted deep suture starts in the subcutaneous tissue on one side and exits through the dermis of this side before entering the dermis of the opposite side and exiting into the subcutaneous tissue where it is tied off. Inverting the suture in this way buries the knot deep in the wound so that there is no risk of the knot protruding through the epidermis. Using deep buried inverted sutures to approximate the dermal layer of wound first takes quite a lot of practice to get right, but doing this will improve the long term appearance of the scar significantly. The gauge of the suture will depend on the thickness of the dermis and tension of the wound, on the body this will usually be 3-0 or 4-0, the face is usually 5-0 or 6-0. Generally the number of these deep buried sutures required is in a ratio to skin sutures of 1:2 or 1.5:2.^{10,14,19}

The skin is closed by using non absorbable nylon sutures or similar. Nylon has low skin reactivity; this reduces the risk of 'suture tracking' or 'railway tracking'. The objective of skin edge closure is to approximate the epidermis with the least tension required, the edges should be slightly everted or in the neutral plane and there should be no step from one edge to the other. The gauge of the suture will depend on the thickness of the skin and tension of the wound; on the body this will usually be 3-0 or 4-0, the face is usually 5-0 or 6-0.^{10,12,14,19}

The use of interrupted vertical mattress sutures can assist skin eversion and it is acceptable to use these in conjunction with simple suturing.^{10,5,19}

The sutures should not be too close to impair blood flow and not too far apart to allow gaping of the skin edge between sutures.

Dressing the wound

For most skin excisions that are dry and have minimal dead space, a simple dressing with three layers of micropore placed longitudinally along the wound is sufficient. Micropore has the advantage that the patient is able to shower with the tape on the next

Figure 1. Ratio of width to length

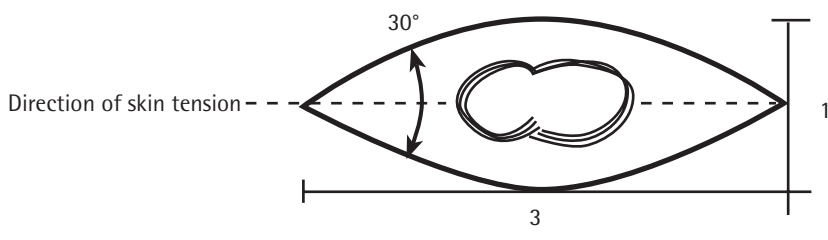


Figure 2. Deep buried inverted dermal suture

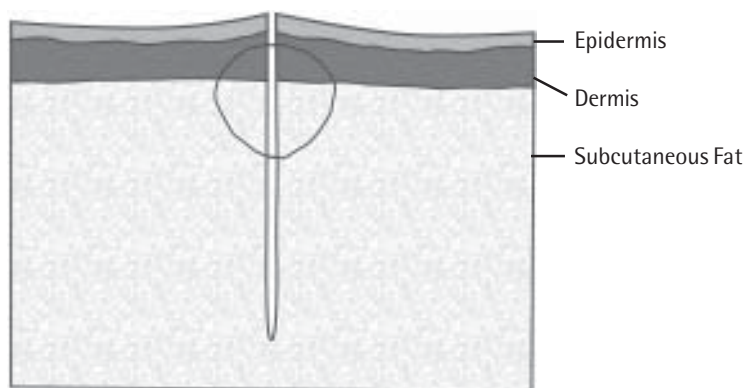


Figure 3. Correctly positioned simple suture

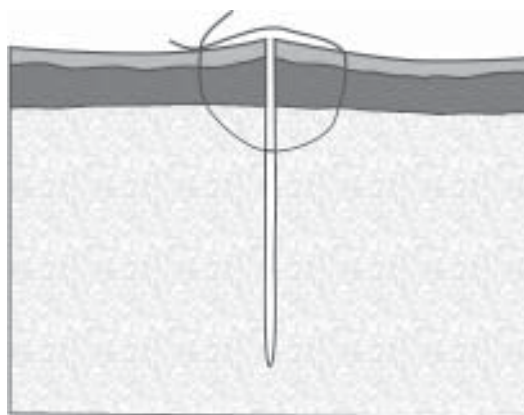
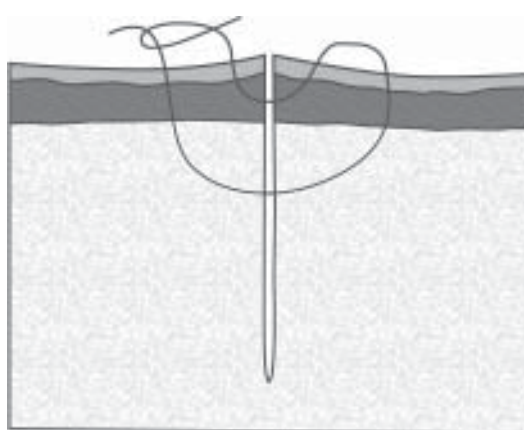


Figure 4. Correctly positioned vertical mattress suture



day. The tape can usually be left on until removal of the sutures.¹⁵

If the wound is oozing and/or there is significant dead space, such as a large lipoma excision, then an absorbent pressure dressing can be used for the first 48 hours post operatively.

Post-operative wound care

Keep the wound clean and dry (apart from a quick shower daily). Use pain relief as required.

Prophylactic antibiotics are not required routinely but should be used if there is a reasonable risk of the wound becoming infected, for example in the perineal area, if the wound is already contaminated, or if the patient is diabetic. One area that prophylactic antibiotics are useful routinely is in the lower limb, the shin and feet, as infection risk is higher in these areas even with a clean operation.^{16,17,18}

Removal of sutures

There is no hard and fast rule but the general principle is to remove the sutures as soon as the wound has epithelialised sufficiently. Table 1 provides a guide.^{10,11,19} This will significantly reduce the risk of stitch tracking ('railway tracking') but does rely on using a deep inverted stitch in the dermal layer of the skin to prevent wound dehiscence and scar stretching.

Table 1. Days to suture removal based upon anatomic location

Anatomic location	Days to suture removal
Face	3–6 days
Neck	5–7 days
Scalp	5–7 days
Trunk	6–12 days
Extremities	7–14 days

After the removal of the sutures, micropore, or similar tape, should be applied longitudinally along the scar; this helps to minimise scar stretching. This needs to be changed only once or twice weekly and the patient can perform normal duties with the tape in place. The only limits would be if the excision is in a very mobile area, such as the shoulder; then limit activities for another week. The tape is used for a minimum of one month but taping can be continued for up to three months if the best possible cosmetic result is desired.^{11,15}

Steristrips are useful on wounds that have a lot of residual tension after suture removal or are located in very mobile areas, such as the shoulder region.

Summary

The final appearance of skin surgical scars can be improved by following these basic principles:

- align the scar with the natural tension lines of the skin;
- careful excision to leave straight edges;
- good haemostasis to prevent underlying haematoma;
- use two layer closure – deep inverted dermal sutures then skin sutures;
- careful skin suturing to align the two edges accurately;
- early removal of sutures to prevent suture tracks;
- tape the wound after removal of the sutures to minimise scar stretching.

The only way to improve your minor surgical technique is to routinely incorporate these practical pointers into your skin excision procedures. It may initially be slower to perform these extra steps but the improvements in the long-term outcome of the surgical scars will be worth the extra effort.

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