

Plate 20

Relaxing/Release Incisions

DESCRIPTION

A relaxing or release incision is, by design, a skin incision created parallel to the length of a wound to facilitate closure of the primary defect. This bipedicle flap is carefully undermined and advanced over the wound. A secondary defect is created by this maneuver, which may be either closed primarily by undermining adjacent skin or left open to heal by second intention.

SURGICAL TECHNIQUE

- (A) Illustration of a wound in which the line of greatest tension (perpendicular to the length of an elongated defect) is located at the widest portion of the defect.
- (B) If the skin edge bordering the wound is thickened or fibrotic, it should be excised with a scalpel blade to improve marginal pliability. A skin incision is then created parallel to the primary defect in a staged fashion, beginning in the center of the zone of greatest tension. In this example, the width of the flap approximates the width of the wound. The cutaneous borders of the wound and bipedicle skin flap created can be gently undermined to facilitate their advancement.
- (C) Towel clamps may be used to initially oppose wound borders. The relaxing incision is extended lengthwise in increments (dotted line in diagram B) as required to relieve tension on the remaining portion of the wound.
- (D) Upon closure of the wound, the secondary defect can be left open to heal by second intention. If sufficient skin is available, the adjacent skin can be undermined and the secondary defect closed directly.

COMMENTS

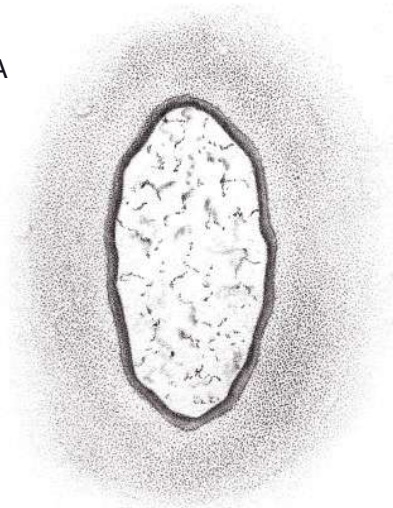
The release incision is a simple and useful procedure to immediately decrease incisional skin tension. A second relaxing incision can be created on the opposite side of a wound if necessary. No guidelines are available to describe how close the relaxing incision should be to the wound. In practice, most relaxing incisions are created 3–10 cm from the wound border, depending on the size of the wound, the regional skin laxity, and the intended position of the secondary defect.

Relaxing or release incisions may seem to be a paradox: closing one defect at the expense of creating a second wound appears illogical. However, there are occasions where closure of a wound that exposes essential tendons, ligaments, nerves, and vessels justifies primary closure in exchange for a defect in a relatively unobtrusive location. Wound closure may be essential to prevent contamination and infection of surgical implants while creating a wound over a muscle surface where second intention healing can occur more easily. Skin coverage over a bony prominence may be necessary for proper healing compared to a defect created in a “protected” region.

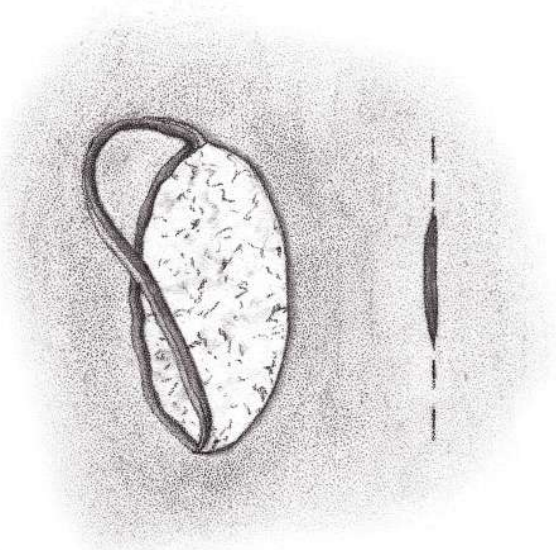
Other wounds susceptible to external trauma and infection can be closed primarily at the expense of creating a secondary defect in an area where an epithelialized scar is less susceptible to future injury or where such a wound would be easier to manage postoperatively. Lastly, chronic nonhealing wounds (as a result of recurrent trauma, radiation, etc.) may heal primarily by using single or paired relaxing incisions (two bipedicle advancement flaps) that have adequate circulation for healing, while creating a secondary defect in a region with sufficient circulation to heal by second intention. Most of these secondary defects, left unsutured, will heal within 3 to 6 weeks.

Plate 20

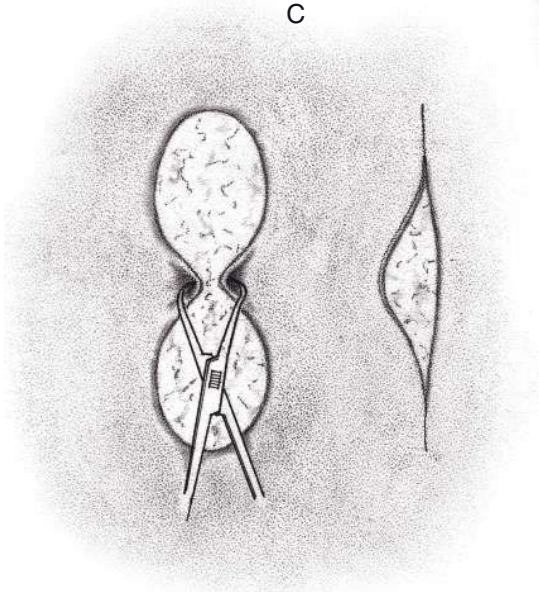
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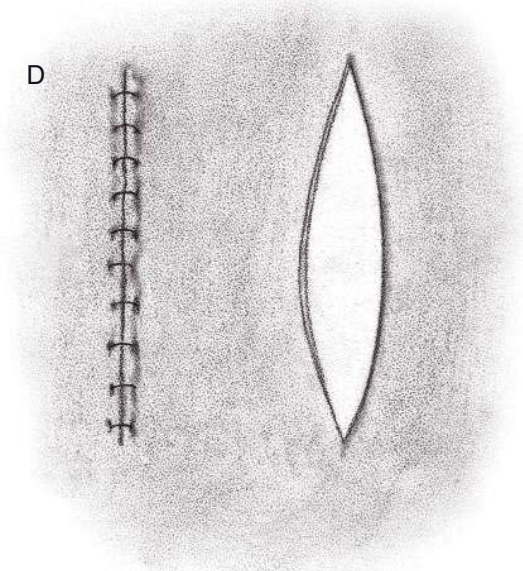


Plate 21

The “Hidden” Intradermal Release/Relaxing Incision

DESCRIPTION

The standard skin release incision is created by incising through the epidermis and dermis. If regional skin tension is not excessive, this incision can be resutured, usually by undermining the adjacent skin to offset the deficit associated with advancing the bipediced advancement flap. The author’s dermal release incision is useful for similar cases, thereby eliminating the need for resuturing a full-thickness incision.

In place of incising the skin through its surface, a no. 15 scalpel blade is used to gently incise the dermis via the hypodermis. Care is taken not to cut through the thin, overlying epidermal layer. As a result, modest skin relaxation can be obtained without the need to suture the skin, creating an additional scar.

SURGICAL TECHNIQUE

- (A) The skin bordering the wound is undermined and elevated with one or more skin hooks. The area for creating the dermal release is identified (see guidelines in Plate 20). A no. 15 scalpel blade is used to incise the dermis with a few delicate strokes to avoid incising completely through the epidermis. Scalpel strokes are repeated until a dermal gap can be seen (visualization is easier in thicker skin). The dermal release incision is made no closer than 3 cm to the cut skin margin.
- (B) The epidermal surface is viewed as the dermis is progressively incised. The blade can be seen tenting the epidermal surface during this process. In this illustration, the epidermal surface remains intact: traction on the skin demonstrates the dermal gap or *release* created (dashed lines).
- (C) Completion of the incisional closure, revealing the modest tension relief achieved. Because the epidermis is preserved, no suturing is required when using this technique.

COMMENTS

Properly executed, the “hidden” dermal release incision provides a modest gain in skin laxity. This dermal release technique does not provide the degree of skin relaxation noted when the release incision is left open to heal by second intention (see Plate 20). Yet, it is a useful way to reduce tension in those cases requiring a comparatively modest reduction in wound closure tension. If the surgeon inadvertently perforates the epidermis, the area can be sutured. There are three modest advantages of this technique: no suturing is required; open wound care is not required, unlike open release incisions; no visible scar is noted with preservation of the epidermal surface.

Plate 21

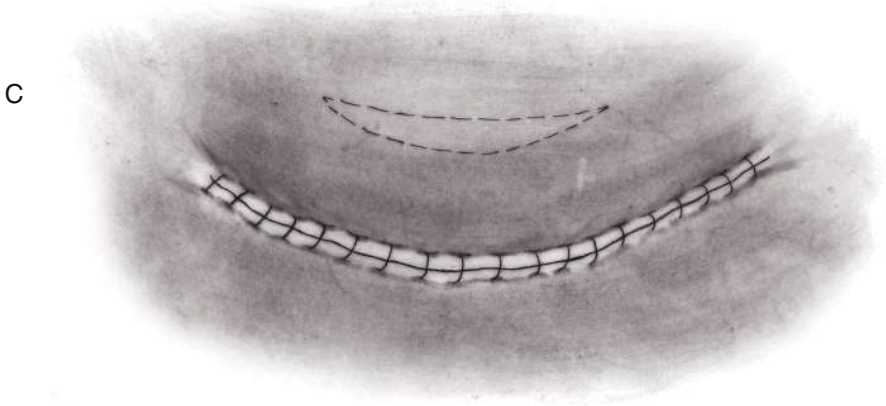
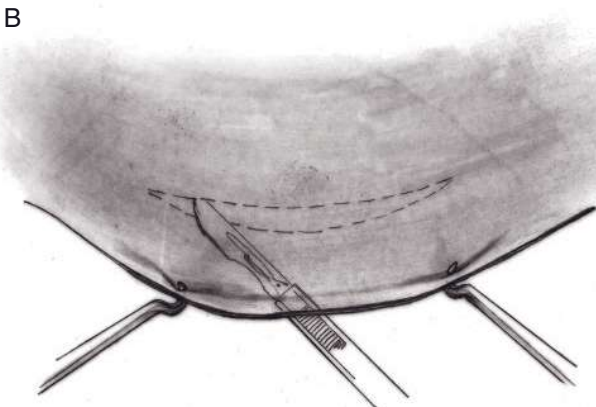
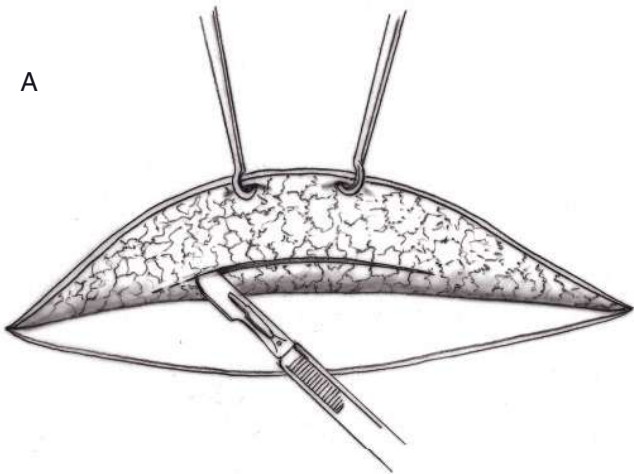


Plate 22

Multiple Release Incisions for Extremity Wounds

DESCRIPTION

Multiple relaxing incisions have been described for closing wounds involving the lower extremities. Multiple small stab incisions can be placed parallel to the long axis of the wound in a staggered fashion to promote skin advancement without the creation of a single, large secondary defect. The single relaxing incision, however, maximizes skin advancement, creating two bipedicle flaps and a single donor defect.

SURGICAL TECHNIQUES

Multiple Relaxing Incisions

- (A) Skin sutures, stay sutures, or towel clamps are used to intermittently attempt apposition of the wound borders during the meshing procedure. Skin borders are carefully undermined.
- (B) Mesh incisions are placed no closer than 1 cm from the skin edge. In general, they are approximately 1 cm long, and no closer than 1 cm apart. If additional rows are required, holes are made approximately 1–2 cm from the initial row in a staggered fashion. A greater number of holes are usually required at the widest area of the defect under greater tension. When sufficient tension has been relieved, the skin borders are sutured. A medicated nonadherent dressing is applied to the wound before the limb is immobilized in a bandage or splint.

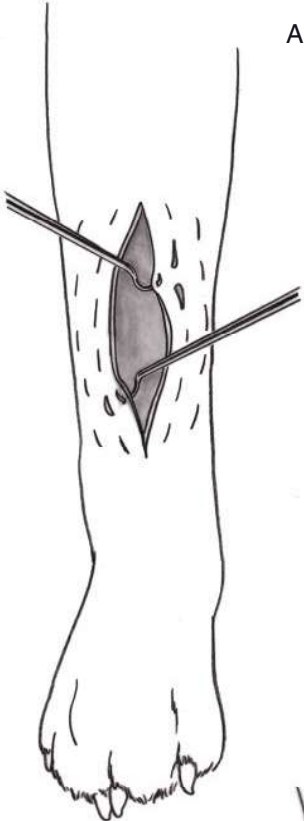
Single Relaxing Incision

- (C) In this example, illustrating a nonhealing wound involving the forelimb, a relaxing incision is made along the caudal aspect of the limb.
- (D) The interposing skin is undermined and the two bipedicle flaps are advanced over the prepared wound bed and sutured together. The solitary defect created on the caudal aspect of the limb (dotted line) generally is managed as an open wound to promote wound contraction and epithelialization.

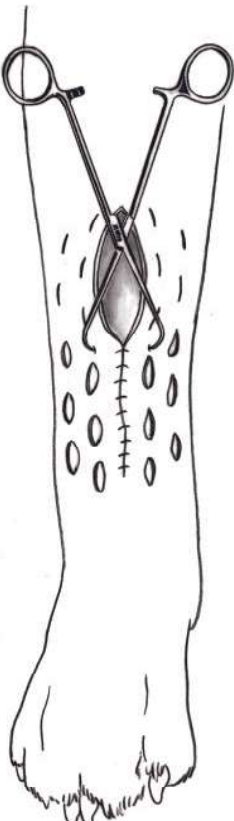
COMMENTS

Although multiple incisions have been used clinically, there is a significant risk of circulatory compromise to the incised skin by accidental division of direct cutaneous vessels and impairment of the cutaneous microcirculation traveling parallel in the skin. A wider dispersion of the multiple incisions would be preferable to minimize this risk, although the gain in tension relief would be less. A single, long, relaxing incision generally provides maximum tension relief compared to multiple, small release incisions, and it may be less likely to cause major circulatory compromise to the skin adjacent to the defect.

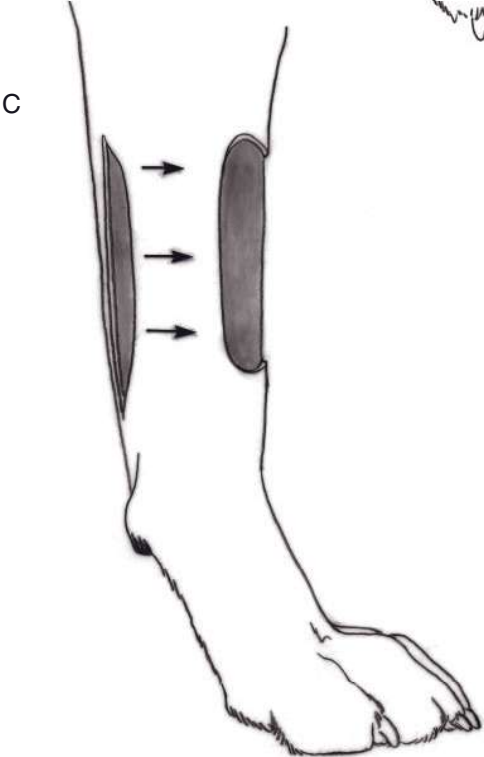
Plate 22



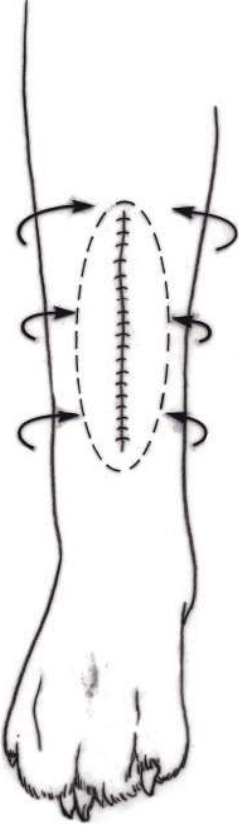
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