

## Plate 16

**V-Y Plasty****DESCRIPTION**

V-Y advancement is a lengthening procedure occasionally used to relieve minor tension to a limited area. Conversely, Y-V closure can be used to increase local skin tension. Both techniques are used to alter tension to a narrow band of skin where minor tension modification is desirable.

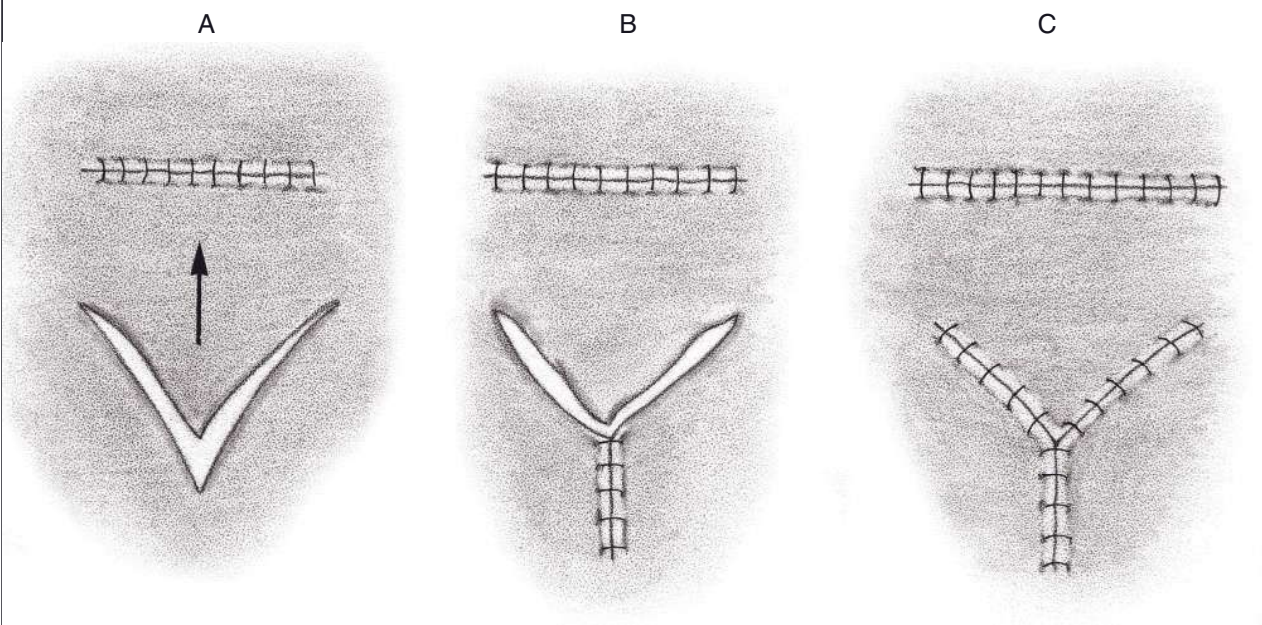
**SURGICAL TECHNIQUE**

- (A) A V incision is made no closer than 3 cm from the skin incision (as a general guideline). The edges are carefully undermined, if necessary.
- (B) Closure of the outer incision edges beginning at the tip of the V incision pushes the inner triangular skin flap forward to reduce tension within the plane of the incision.
- (C) A Y configuration is created with advancement of the triangular flap.

**COMMENTS**

V-Y plasty is marginally effective in relieving skin tension; it cannot dramatically reduce tension over a wide area. It may be most effective for minor tension adjustments, especially in eyelid surgery. It is a very simple technique to execute.

Plate 16



## Plate 17

## Z-Plasty (Option I)

### DESCRIPTION

Z-plasty is used to (1) alter skin tension adjacent to an incision, (2) lengthen restrictive scars, and (3) change the direction of a linear scar into a less discernable pattern. In the latter case, the human eye has greater difficulty following a zigzag design compared to a linear scar, especially one that crosses a natural skin line or fold in a relatively hairless area. As a result, Z-plasty can change the position of the scar into a less conspicuous skin fold or line. The conventional Z-plasty technique involves forming two equilateral triangles. Each limb and the central member of the Z incision are equal in length; each limb extends at a 60-degree angle from the central member. Theoretically, the net length gained along the restrictive skin zone is approximately 75%.

### SURGICAL TECHNIQUE

- (A) Diagram illustrating the theoretical gain associated with Z-plasty. The theoretical gain in length is the difference in length between the long diagonal and the short diagonal.  $AB - CD = \text{net gain}$ . (In practice, the actual gain is less than the theoretical gain).
- (B) A "Z" is drawn onto the skin. Each limb of the Z and the central member are equal in length. Each limb is drawn at a 60-degree angle to the central member. The Z design is positioned so that the central member overlies the restrictive scar (shaded area). The thin scar band is normally excised.
- (C-E) Each triangular flap (I and II) is undermined and rotated into the opposing donor beds. The tip of each flap can be trimmed (rounded) to preclude the occasional necrosis noted in this area. Lastly, the individual flaps are sutured into place.

### COMMENTS

Most Z-plasty procedures are used to increase the length of a skin area, thereby improving mobility. Lengthening restrictive scar bands or zones of tension perpendicular to a sutured incision under excessive tension is the most common use in veterinary medicine. Z-plasty actually is the simultaneous transposition of two equilateral triangular local flaps. As each flap is transposed, additional skin is placed in the previously restricted zone from the immediate area. The resultant scar also is more pliable than the previous linear scar. One or two standard transposition flaps actually may be more capable of lengthening more diffuse restrictive scars.

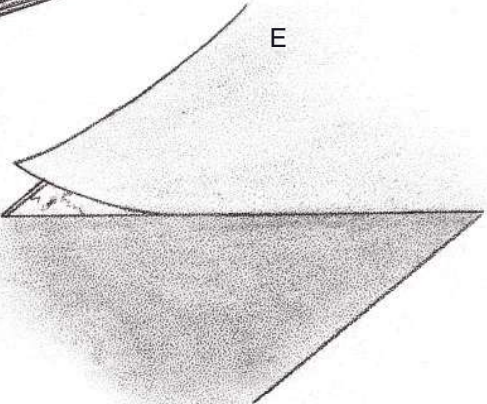
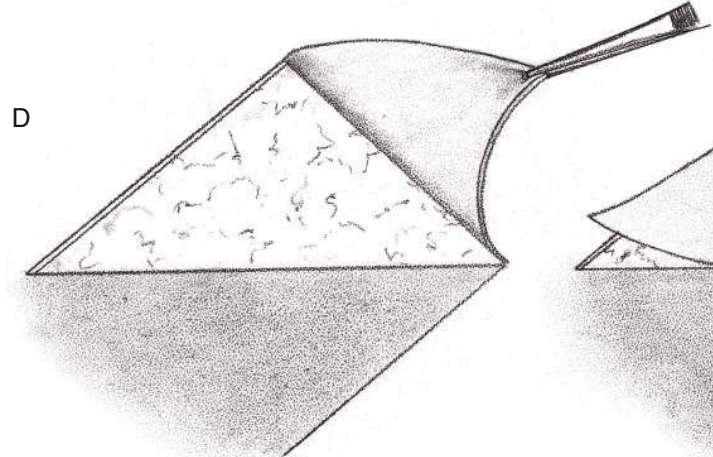
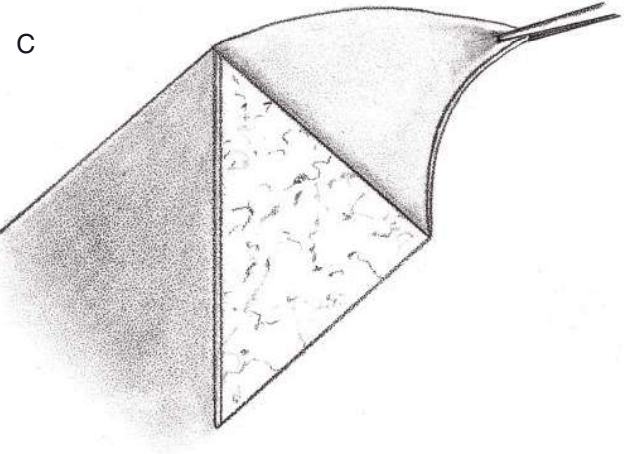
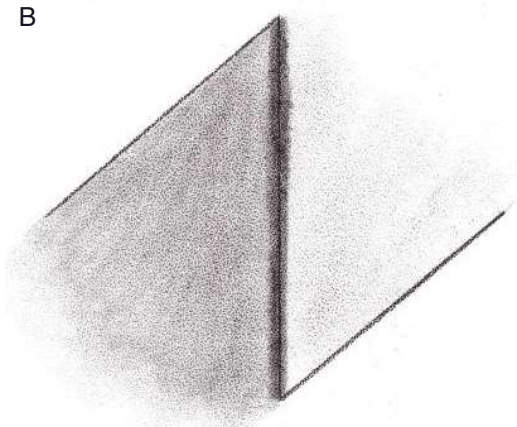
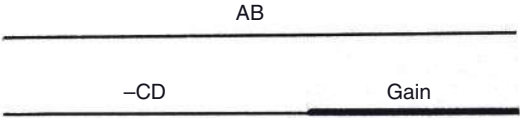
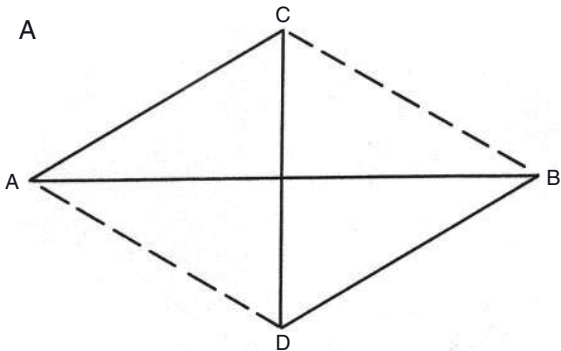
Z-plasty is somewhat confusing to clinicians unfamiliar with its design and execution. Practicing Z-plasty designs on thin sheets of elastic cloth or foam rubber is the best way to understand this procedure before attempting its use in a clinical situation.

Human reconstructive surgery textbooks demonstrate multiple variations in this standard Z-plasty technique. However, in veterinary surgery the basic equilateral triangle design employing 60-degree angles is sufficient for most situations where Z-plasty is indicated. Although the creation of wider angle flaps 70–90 degrees, can increase the theoretical length of gain to 100% and 120%, respectively; transposing these wider flaps is more difficult, except for areas of thin, elastic skin.

Experimental studies in dogs have indicated that *theoretical gains* in length, based on geometric measurements, were different from the actual gain achieved. For example, Z-plasty on the trunk of dogs has demonstrated that the actual gain of a 60-degree angle Z-plasty with 8-cm limbs was 28% less than theoretical measurements (a 45% gain as opposed to 73%). As the limb length decreased, the percentage of gain decreased. A Z-plasty with 1-cm limbs had 45% less gain than calculated (73% gain, less 45%, equals a total gain of 28%).

For Z-plasty to work properly, the skin in the base of the flaps created must be loose and elastic enough to rotate and stretch into its new position. If skin is under tension perpendicular to the central member of the Z, it may be impossible to transpose these flaps.

Plate 17



## Plate 18

**Z-Plasty (Option II)****DESCRIPTION**

Z-plasty can be used to reduce tension on wound closures otherwise difficult or impossible to close in a given area.

**SURGICAL TECHNIQUE**

- (A) The 60-degree angle Z-plasty is drawn onto the skin, with the central member of the Z parallel and overlying the line of greatest tension. It is desirable to create the Z incision no closer than approximately 3 cm from the primary incision. Each triangular flap is gently undermined.
- (B) As the primary incision is sutured closed, each flap will begin to transpose into its appropriate position.
- (C) Upon completion of the closure of the incision, the Z-plasty incisions are sutured to complete the procedure. The tips of each flap can be trimmed (rounded) to preclude the occasional necrosis noted in this area.

**COMMENTS**

See Plate 17. Placement of the Z-plasty incision must take into consideration regional blood supply, especially major direct cutaneous arteries.



Plate 18

