Biwinged Excision for Round Pedal Lesions

A technique for excising round pedal skin lesions is presented as an alternative to standard elliptic or lenticular excision. Biwinged excision maximally preserves healthy tissue and allows complete excision of a wide variety of lesions from the foot. The authors present a procedural outline of this technique and include several illustrative cases to demonstrate its utility. (The Journal of Foot and Ankle Surgery 35(3):244-249, 1996)

Key words: foot, skin; surgery, plastic; surgical flaps

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Round lesions can often be difficult to close after excision, especially in the foot. This is because the foot has limited redundancy of skin and limited mobility in many areas, especially along the margins and plantarly. For these reasons, minimizing excision of healthy skin is a priority; otherwise, grafts will be needed. The biwinged excision technique was first described and analyzed by Hirshowitz, Kaufman, and Amir in 1980 (1). This technique includes consideration of proper margins for lesion excision, healthy skin preservation, and cosmetic closure. Their technique was shown to be useful for excising various facial lesions. In their work, they described the technique and mathematically analyzed the amount of tissue saved by the procedure as compared with other traditional excision techniques. The present authors have used this technique with satisfactory results to excise a variety of pedal skin lesions since 1992. This technique is reviewed and several illustrative cases are presented.

Technique

Appropriate candidates are routinely prepared for the procedure. In these cases, the authors have chosen local nerve blocks for anesthesia. Hemostasis is maintained via a pneumatic ankle tourniquet. To preserve flap vascularity, the authors do not recommend using injectable vasoconstricting agents, if a local field block is being performed. The lesion and appropriate margins are outlined. The lesion is then bisected with a skin scribe line that parallels relaxed skin tension lines. The line is approximately three times the diameter of the lesion in length. Two equal triangles are then outlined on either side of the lesion; one is drawn on each side of the bisecting line. The base of each triangle is one quarter to one half the diameter of the lesion to be excised. The skin within the margins of these markings is excised to the subcutaneous level. Skin edges are then mobilized deep to the subcutaneous layer as needed to allow approximation. When the incision is closed, there are three separate lines of tension to disperse the forces of closure. The closed incision looks like a rounded step or a lazy “S.” Maximum tension occurs at the center of the incision, and this central area generally requires more undermining. The wound is closed with interrupted, nonabsorbable suture. If a tourniquet is used, it should be deflated before closure to ensure hemostasis and to enable flap viability to be assessed (Fig. 1).

Discussion

Hirshowitz, Kaufman, and Amir (1) mathematically analyzed the amount of tissue excised after using the biwinged technique and six other procedures (Fig. 2). The technique most frequently used to excise round lesions is the lenticular or elliptic technique (2) (Fig. 2). This technique requires a ratio of 1:4 between the diameter of the lesion and the length of the ellipse. A smaller ratio may result in incomplete closure, or dog ears. When biwinged closure was compared with elliptic excision, biwinged closure spared from 30 to 64% of healthy tissue (1). Although saving tissue is the main advantage of biwinged closure, this technique also disperses tension throughout three separate linear direc-
FIGURE 1 Operative stages of the biwinged excision. A, design of excision \((D = \text{short axis})\); B, undermining wound margins along their entire length; C, wound closure; D, maximal tension occurs in suture line midstep. (Reproduced with permission of author and publisher, from Hirshowitz, B., Kaufman, T., Amir, I. Biwinged excision for closure of rounded defects. Ann. Plast. Surg. 5:373–380, 1980 (1). This was Fig. 1 in the original article.)

minimizes complications such as painful or unsightly scarring, joint contracture, or nerve entrapment while facilitating complete excision of a variety of lesions.

The authors have used the biwinged excision technique routinely and have noted that the procedure allows generous excision of foot lesions. During the last 3 years, this technique has replaced lenticular excision in the senior author’s practice. Lesions from all areas of the foot, including plantar and medial skin, have been excised (Figs. 3–7). This technique has been particularly useful for excising digital lesions, which can be challenging because of lack of redundant skin.

In our cases to date, scars have been free from hypertrophy or contracture. We have not noted any unusual tendencies for infections, dehiscence, or hematoma. Healing times have not varied from the 10 to 21 days expected for most closures. No complications unique to this method have been experienced.

Realistic estimation of local availability of skin for closure when planning excision of any lesion is important. The size of lesion including margins and area of the foot affected are both important. On the dorsum,
FIGURE 3  Excision of round lesion from medial foot: A, lesion diameter measured; B, lesion, margins, and ellipses marked; C, area of excision to subcutaneous layer; D, flaps mobilized; E, closure with interrupted sutures.

skin edge mobility is liberal. However, on the plantar surface, especially the heel, skin mobility is minimal. This limits our ability to remove larger lesions from those areas. Contingency plans, which may include grafting or local flaps, should be formulated before surgery. Other standard techniques, such as the oblique sigmoid island flap (3), sliding subcutaneous flaps (4), V-Y advancement flaps (5), V-Y-S-plasty (6), T-plasty (7), and others (8–10), may also be useful for excising a round lesion and are referenced for further study by the reader.

Recovery from this technique is similar to that for
**FIGURE 4** A, appearance of superficial basal cell carcinoma. B, the lesion, margins, and ellipses are marked to yield a 3:1 length-to-lesion diameter ratio. C, the 7-week postoperative appearance of the right foot. The margins were histologically found clear of tumor.

**FIGURE 5** A, dermatofibroma on digit. Excision in this area can be difficult owing to lack of redundant skin; B, excision design; C, biwinged closure; D, specimen.

FIGURE 7  A, congenital pigmented nevus on the plantar aspect of the foot. B, the lesion and margins are marked for excision. C, closure of the wound.

standard elliptic excision with sutures maintained for 10 to 14 days and weightbearing allowed as appropriate for the site of excision. The authors prefer to keep patients nonweightbearing for approximately 3 weeks if the excision is plantar. Operative time in the authors' experiences is similar to that for elliptic excision.

Conclusion

A review of the biwinged technique developed by Hirshowitz, Kaufman, and Amir (1) for skin lesion excision was presented, and its application to foot surgery was discussed. Characteristics of the biwinged excision were reviewed, and illustrations of its utility
were provided. The authors recommend this technique as an alternative choice for excising round pedal lesions.

Acknowledgment

The Medical Editing Department, Kaiser Foundation Research Institute, provided editorial assistance, including reference verification.

References