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VIDEOS OF SURGICAL PROCEDURES IN DERMATOLOGY

Type I Keystone Island Flap[☆]

Colgajo de keystone tipo I



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Introduction

We present a video showing the type I keystone flap technique used in a 79-year-old woman to reconstruct the surgical defect resulting from the excision of a squamous cell carcinoma on her leg, with associated stasis dermatitis and skin changes due to lipodermatosclerosis of the lower limbs.

First, the flap is designed on the area adjacent to the defect that can provide the largest tissue contribution and greatest tissue mobility (Fig. 1). After preparation of the surgical field with povidone iodine and local anesthesia with mepivacaine, 2%, plus epinephrine, the tumor is excised, continuing down to but not including the fascia. The skin of the flap is then incised using a scalpel and the subcutaneous tissue is liberated by blunt dissection using scissors, taking care not to damage the perforating vessels. The proximal border is sutured to the defect with silk or staples and a V-Y double advancement is performed at each of the lateral vertices. Finally the distal border is sutured to the defect using silk or staples.

The keystone flap is mainly used for surgical defects on the lower limbs or trunk, although it has also been employed at other sites, such as on the genitalia and the face. There



Figure 1 Design of the type I keystone flap.

are no absolute contraindications; relative contraindications include peripheral artery disease and infection. Particular benefits of this flap are its greater viability and the good cosmetic result. Complications can arise from wound infection, hematomas, or necrosis due to damage to the perforating arteries if blunt dissection was not used or was too aggressive. Alternatives to this type of flap are the horn-

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shaped fasciocutaneous flap, island flap, and full thickness skin graft.

Discussion and Conclusions

The keystone flap was first described in 2003 by Behan,¹ who defined 4 subtypes according to complexity of the flap. Type I does not penetrate the muscle fascia and is useful for defects of up to 2 cm. Type II is used to cover larger defects of 2 to 5 cm, and has 2 variants: IIA, in which the fascia is incised along the convex border of the flap, and IIB, in which, in addition to the fascial incision, a full thickness skin graft is used to cover the secondary defect. Type III uses 2 keystone flaps, making it a double keystone, for defects of 5 to 10 cm. And type IV, which consists of a rotational keystone flap that requires mobilization of sufficient subfascial tissue, is used mainly to cover open fractures.

As with other fasciocutaneous flaps, the keystone flap derives its blood supply from the axial and perforating vascular system of the legs, thus guaranteeing its viability. Its design allows it to cover large as well as deep defects, preserving sensitivity and avoiding differences in skin color and texture. Apart from its use in the limbs, this flap has been employed for the reconstruction of defects at other sites, such as the trunk, cheek, nose, lower eyelid, neck, and anogenital region.²⁻⁴

A further advantage of the keystone flap is that the use of skin adjacent to the surgical defect preserves skin appearance and thickness, in contrast to skin grafts, which almost always have a different appearance, as they are derived from skin from a distinct anatomical site, and may

be depressed due to a lack of subcutaneous cellular tissue. It should also be noted that full thickness skin grafts generally take longer to perform.

As can be seen in the video, the keystone flap is not particularly difficult to perform and we consider it to be a very interesting, safe, and rapid option with very good functional and cosmetic results.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Appendix A. Supplementary data

Supplementary data associated with this article can be found with the online version at [doi:10.1016/j.adengl.2017.11.013](https://doi.org/10.1016/j.adengl.2017.11.013).

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