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Innovative reconstructive dermatosurgery: O-to-5 advancement rotation flap for circular cutaneous defect following basal cell carcinoma excision in the shoulder area

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Key words: dermatologic surgery; reconstructive surgery; O-to-5 advancement rotation flap; basal cell carcinoma; skin cancer defect; shoulder area.

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Consent for publication: the patient gave his written consent to use his personal data for the publication of this case report and any accompanying images.

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The case

A 69-year-old male presented with a pigmented, tumor-like lesion measuring 4×5 cm, located on the right shoulder between the *regio deltoidea inferior* and the *pars proximalis musculi bicipitis brachii* (Figure 1). The lesion had been present for approximately 10 years. The formation was clinically suspected for Morbus Bowen.

Our choice

The patient demonstrated sufficient elasticity, allowing for effective mobilization of adjacent tissue without the need for skin grafting. An initial plan was made to reconstruct the defect using a double opposing (Ying-Yang) flap design.

Procedure

The resulting primary defect measured approximately 5×5 cm and had a circular configuration (Figure 2). The flap axis was directed inferolaterally to the resection site. The inferior opposing rotation flap was designed to be approximately 1,5 times the diameter of the defect. The region's relatively thick dermis made it particularly suitable for enduring mechanical stress. Sensory innervation in this area is provided by nervus cutaneous brachii lateralis superior. Vascular supply is primary supported through an arterial anastomotic network, while the venous drainage is maintained by the cephalic vein.

To preserve vascular integrity, careful undermining was performed down to the muscular fascia of the right upper arm. The flap, measuring approximately 7×4 cm, was then elevated off the underlying muscular tissue. This created a comma-shaped secondary defect (Figure 3a). After elevation (Figure 3b), the flap was rotated into the primary defect. The team concluded that closure using only a single opposing flap was sufficient, thereby minimizing tissue sacrifice and reducing operative time – particularly important given the use of local anesthesia and the patient's underlying atrial fibrillation and flutter.

Subsequently, careful undermining was performed around the primary defect, enabling additional advancement of the surrounding tissue without excessive tension. The initial suture – a 1-0 polypropylene – was placed between the apex of the rotation flap and the corresponding point on the opposite edge of the defect. After additional sutures, we noticed redundant tissue folds developing at both terminal points of the curved incision line as well as along the inferior aspect of the rotation flap. These redundant segments were elevated, excess tissue was excised at the base, and the resulting defects were sutured accordingly. Mild residual tension persisted inferiorly at the secondary defect;

this area was further modified into a larger triangular excision to release the remaining tension vectors.

The final reconstructed configuration resembled the number “5”, giving the design its name – O-to-5 advancement rotation flap. Multiple single interrupted 1-0 and 3-0 polypropylene sutures were placed to complete the closure (Figure 4). Histological examination revealed a basal cell carcinoma, staged 1 pT2NxMxR0. No postoperative complications were noted (Figure 5).

Comment

In upper limb defects, the size of the defect largely determines the available reconstructive options.[1] Medium-to-large defects often limit the use of simpler reconstructive methods, necessitating more advanced approaches such as bilobed local skin and subcutaneous transpositional flaps,[2] opposing rotational (Ying-Yang) flaps,[3] or myocutaneous flaps.[4]

The outcome

The outcome at the 1-month follow-up is shown in Figure 5.

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Figure 1. Preoperative view: a pigmented, tumor-like lesion measuring 4×5 cm, characterized by intermittent bleeding and subsequent crust formation located on the right shoulder between the *regio deltoidea* inferior and the *pars proximalis musculi bicipitis brachii*.

Figure 2. Intraoperative view: primary circular defect measured approximately 5×5 cm.

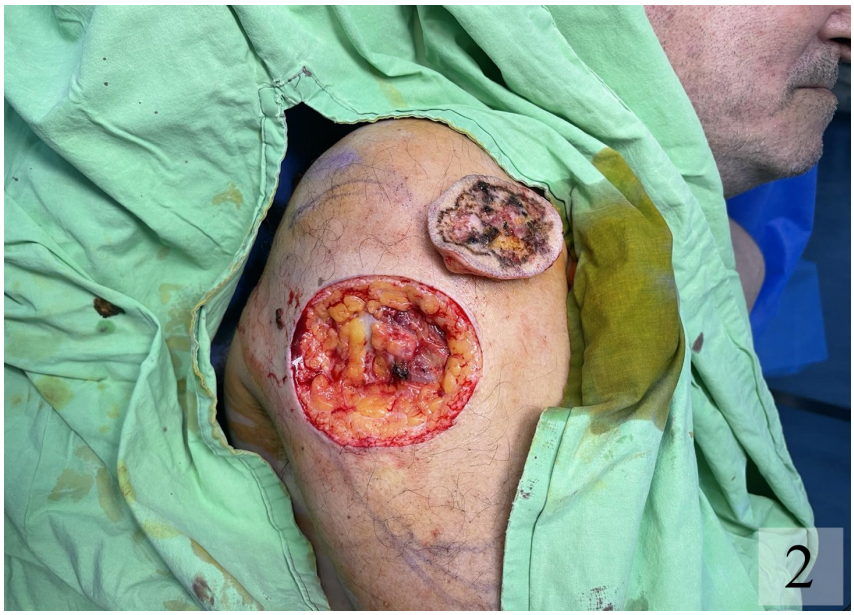

Figure 3. Intraoperative view: a) a comma-shaped secondary defect; b) elevation of the flap before rotating into the primary defect.

Figure 4. Intraoperative view: multiple single interrupted 1-0 and 3-0 polypropylene sutures are placed to complete the closure. The final appearance of the reconstruction resembles the number “5”.

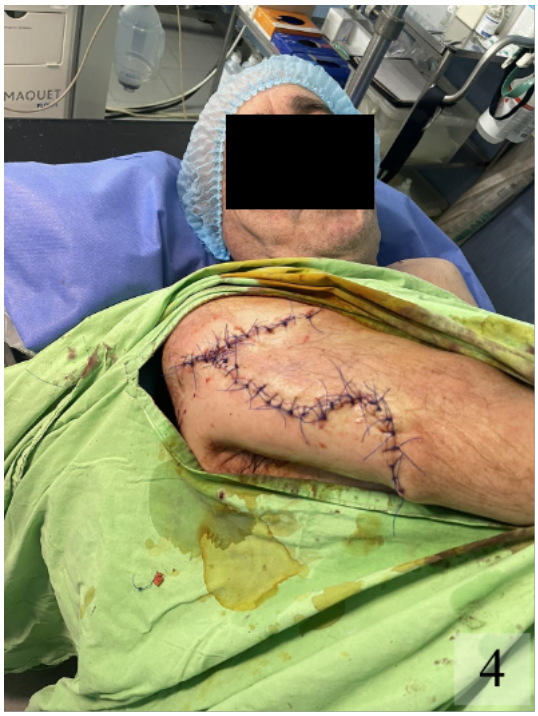

Figure 5. 1 month follow-up.