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Modifying double (bilateral) opposing rotation advancement flap for a problematic scalp lesion

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The case

A 74-year-old male presented to the dermatology department with primary complaints of a problematic tumor-like pigmented formation located on the vertex of the scalp. A clinical and dermatoscopical diagnosis of lentigo maligna was established, and surgical excision under local anesthesia was recommended.

Our choice

The tumorous lesion located on the vertex, slightly to the right temporal region (Figure 1a), was surgically removed with an oval excision. The resultant primary defect was round, measured 1 cm × 1 cm, with exposed periosteum.

Small to medium-sized scalp defects can present a challenge for every dermatosurgeon, primarily because the scalp is a hair-bearing region – an area that holds not only anatomical and functional significance but also personal and aesthetic importance for many individuals. Given that the region is prone to tension, primary closure would not ensure a tension-free result. Secondary intention healing could lead to infections and prolonged healing time, while the use of a skin graft in this region may result in alopecia, and if the recipient tissue has poor vascularity, even graft necrosis.

Reconstructive options included an island flap or an advanced rotational flap; however, reconstruction with a double opposing flap was preferred due to its superior profile and its ability to distribute tension across multiple vectors. This will result in a more tension-free closure and a more favorable cosmetic outcome. Additionally, the proximity of the posterior auricular artery, superficial temporal artery, parietal emissary vein, auriculotemporal nerve, and greater occipital nerve must be carefully considered.

We present a case involving a small-to-medium-sized primary defect following surgical excision of a scalp lesion. The team opted for reconstruction of the defect with a surgical flap technique using the patient's surrounding skin. Although the patient presented with reduced hair follicle density, the final scar was strategically planned to be positioned within the non-hair-bearing area.

Procedure

Under local anesthesia with 1% lidocaine, the lesion was excised with a 3-mm safety margin in all directions. The resulting primary defect was round, with exposed periosteum. To reconstruct the scalp defect, the team opted for a double (bilateral) opposing rotation advancement flap. The procedure began with the design of two opposing flaps, each measuring approximately

twice the length of the primary defect. Preservation of the underlying vascular supply was of utmost importance. Flap elevation and careful dissection were performed down to the hypodermis, followed by undermining of the two flaps. The resulting defect resembled a shuriken, displaying an S-shaped configuration (Figure 1b). The opposing flaps were then advanced. Tension-free adaptation at the lower sites of the flap was, however, challenging due to the thickness of the regional skin and its limited mobility resulting from the local tension vectors. To reduce this tension and ensure proper adaptation, a minor modification of the flap design was introduced - two additional perpendicular Burrow's triangles extending from the inferior margin of the left opposing flap. This modification resulted in a secondary defect, which was closed using single interrupted 2-0 polypropylene sutures (Figure 1c). The postoperative period was uneventful (Figure 1d).

Comment

The double opposing (Ying-Yang) flap is a versatile, effective, and reliable technique for managing scalp defects, particularly when tension at the incision site is a concern.[1] However, certain cases may benefit from modification, allowing for optimized surgical outcomes and refined aesthetic results.[2]

The modified double opposing flap is a highly effective reconstructive option for defects in areas with limited tissue mobility, where classical techniques fail to achieve uniform tension redistribution. Its modified design ensures a more balanced redistribution of the vectors across the defect. Additionally, optimal functional outcomes can be achieved through careful undermining of the flap while preserving its vascular supply and innervation, along with effective scar camouflage within the hair-bearing region.

The outcome

Figure 1d illustrates the clinical outcome observed 20 days after surgery.

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Figure 1. Intraoperative view: tumorous lesion located on the vertex, slightly to the right temporal region (**a**); the resulting defect resembles a shuriken, displaying an S-shaped configuration (**b**); the final defect is closed using single interrupted 2-0 polypropylene sutures (**c**); 20 days postoperative view (**d**).