



# The Margin-Anchor Flap: A Novel Split-Closure Technique for Large Temporal BCCs to Avoid Grafting, Scarring Alopecia, and Facial Distortion

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## Abstract

**Background:** The temporal region accounts for roughly 9–13% of all head and neck basal cell carcinomas (BCCs). Large surgical defects in the temporal region following cutaneous oncologic resections present major biomechanical challenges. Traditional techniques including extensive local flaps or full-thickness skin grafts (FTSG) frequently result in temporal hollowing, texturing mismatches, distortion of critical free margins, neurovascular damages or permanent scarring alopecia along the hairline.

**Case Presentation:** We present the case of a 66-year-old female patient who presented with a substantial, Pigmented basal cell carcinoma (BCC) of the right temporal region. Wide local excision with clear histopathological deep and peripheral margins yielded a substantial 3.5X2.5cm surgical defect.

**Surgical Technique (The Margin-Anchor Flap):** Rather than using a skin graft, a modified local Rotational-Advancement flap was designed. The superior border of the flap incision was extended superiorly by >0.5cm along the temporal aesthetic line to recruit local tissue horizontally. The primary body of the flap was advanced under optimal physiological tension and anchored firmly to the underlying deep temporal fascia using slowly absorbable 4-0 vicryl sutures. This “Margin-Anchor” technique locked the structural closing vectors into place, absorbing all kinetic stress and shielding the periorbital units (eyebrow, lateral canthus), the cheek, the angle of the mouth, and the pinna from anatomical distortion. A small, residual peripheral crescent of the defect adjacent to the permanent frontotemporal hairline was left to heal via controlled secondary intention.

**Results:** Complete wound healing and edge epithelialization were achieved within 3 weeks without any flap ischemia or necrosis. There was zero postoperative ectropion, eyebrow lag, pinna displacement, or facial asymmetry. The micro-deficit adjacent to the scalp healed seamlessly, beautifully preserving the natural hairline contour and completely avoiding surgical scarring alopecia or temporal hollow flattening.

**Conclusion:** The Margin-Anchor Flap utilizing a split-closure approach offers a powerful, low-morbidity option for large temporal reconstructions, eliminating the need for extensive autologous grafting or high-risk tissue rearrangement.

**Keywords:** Temporal BCC; Flap Surgery; Fractional Closure

## Abbreviations

BCC: Basal Cell Carcinomas; FTSG: Full-Thickness Skin Grafts.

## Introduction

The temporal region is an unforgiving facial zone characterized by a narrow anatomical safety plane for the frontotemporal branch of the facial nerve, delicate aesthetic contours, and adjacent highly mobile structures. Cutaneous basal cell carcinomas (BCC) frequently develop within this space due to chronic, cumulative ultraviolet exposure, often requiring radical excisions that lead to large surgical defects [1].

When a temporal defect reaches an expansive size primary linear closure is completely precluded. The resulting tension forces will translate directly onto mobile free margins, causing lagophthalmos, severe ectropion, or eyebrow distortion. To bridge such gaps, classic reconstructive approaches rely heavily on full-thickness skin grafts (FTSG) or extensive cervicofacial rotation flaps. However, in elderly individuals, grafts over the temporal bone frequently take on a depressed, dyschromic, “stamped-on” appearance that significantly accentuates temporal hollowing. Meanwhile,

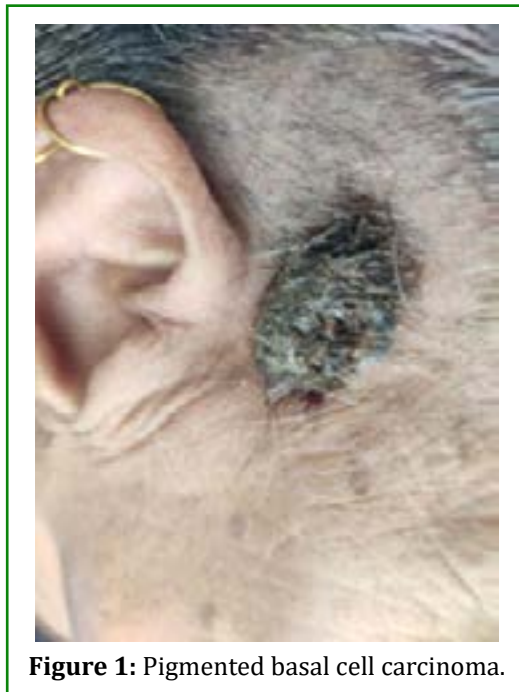
large flaps require massive surgical dissection fields, increasing the risk of distal edge necrosis, hematoma, or severe distortion of the permanent hairline culminating in noticeable cosmetic scarring alopecia.

This case report details a novel, tissue-sparing surgical solution the Margin-Anchor Flap with intentional fractional closure deployed successfully in a 66-year-old female to achieve complete structural stabilization and cosmetic preservation without autologous grafting [2].

## Case Presentation

### Clinical Evaluation

A 66-year-old female with a history of chronic sun exposure presented with a biopsy-confirmed, slowly enlarging, deeply pigmented basal cell carcinoma involving the right temporal region. Clinical examination revealed a multi-lobular, deeply pigmented plaque with irregular borders measuring approximately 3x 2cm over the central temporal aesthetic subunit. The underlying structures demonstrated mobility, with no fixed attachments to the bone or focal neurological deficits in the frontalis muscle distribution [3,4].



### Operative Intervention and Defect Characteristics

Under local tumescent anesthesia, the lesion was excised via wide local excision with 4mm peripheral surgical margins. The plane of the dissection was carried down to the dense, glistening layer of the deep temporal fascia to ensure absolute clearance of the deeply pigmented tumor columns. The final

resulting surgical defect was a large, vertically oriented ovoid wound measuring 3.5x2.5cm [5].

### Flap Construction & Mechanical Anchoring

To avoid the cosmetic deformity of a skin graft, a modified Local Rotational-Advancement flap was mapped along Peri-

auricular margin and parallel to temporal hair line. Crucially, the superior border of the flap incision was extended superiorly by 0.5cm past the superior pole of the defect, curving naturally along the temporal aesthetic line [6].

Meticulous undermining was carried out strictly in the superficial subcutaneous fat plane well above the superficial temporal fascia safeguarding the frontotemporal branch of the facial nerve. The mobilized flap was advanced anteriorly into the wound bed.

To absorb the massive kinetic energy required to bridge a 3.5x2.5cm space, the thick dermal leading edge of the flap was anchored directly to the rigid, underlying deep temporal fascia using 4-0 vicryl sutures. This structural anchoring

locked the flap into place and bore most of the closing tension, ensuring that zero pull was exerted on the right eyebrow, lateral canthus, cheek, or the angle of the mouth. The pinna of the ear remained anatomically undisturbed in its natural position with zero anterior pulling or flaring [7].

Following this primary approximation, a small, residual crescent-shaped peripheral defect (representing less than 20% of the original wound area) remained at the far superior-posterior aspect, directly adjacent to the hair-bearing scalp. Because this residual gap sat entirely over a non-distortable structural framework, it was left open intentionally to heal via controlled secondary intention (split-closure technique) [8].



**Figure 2:** Design of the modified rotational-advancement flap with superior marginal extension beyond the superior pole of the defect.



**Figure 3:** Elevation and mobilization of the flap in the superficial subcutaneous plane to facilitate tension-free advancement.



**Figure 4:** Fascial fixation of the advanced flap with intentional preservation of a small anterior residual defect for secondary-intention healing (split-closure technique).

## Results

The patient tolerated the procedure exceptionally well. Follow-up at 1 week demonstrated a completely viable flap with excellent perfusion and zero margin necrosis, epidermolysis, or hematoma formation. The anchored suture

lines healed with perfect retention of facial symmetry; there was zero evidence of ectropion, lower lid distraction, or asymmetric brow positioning. Symmetrical movement of the frontalis muscle was preserved completely, verifying the safety of the facial nerve branch [9].



**Figure 5:** Three weeks postoperatively showing complete healing, good flap integration, and preservation of adjacent facial contours with an excellent cosmetic outcome and preservation of hair line.

The small, open crescent adjacent to the hairline filled rapidly with healthy granulation tissue by week 2 and achieved full epithelialization by week 3. Because the flap contained adequate hair-bearing skin, the healed area blended well with the surrounding scalp, resulting in a natural appearance with proper hair cover and without any obvious cosmetic deformity. Furthermore, by keeping the dissection plane high and local tissue intact, the natural contour of the temporal hollow was preserved perfectly without cachectic hollowing [10].

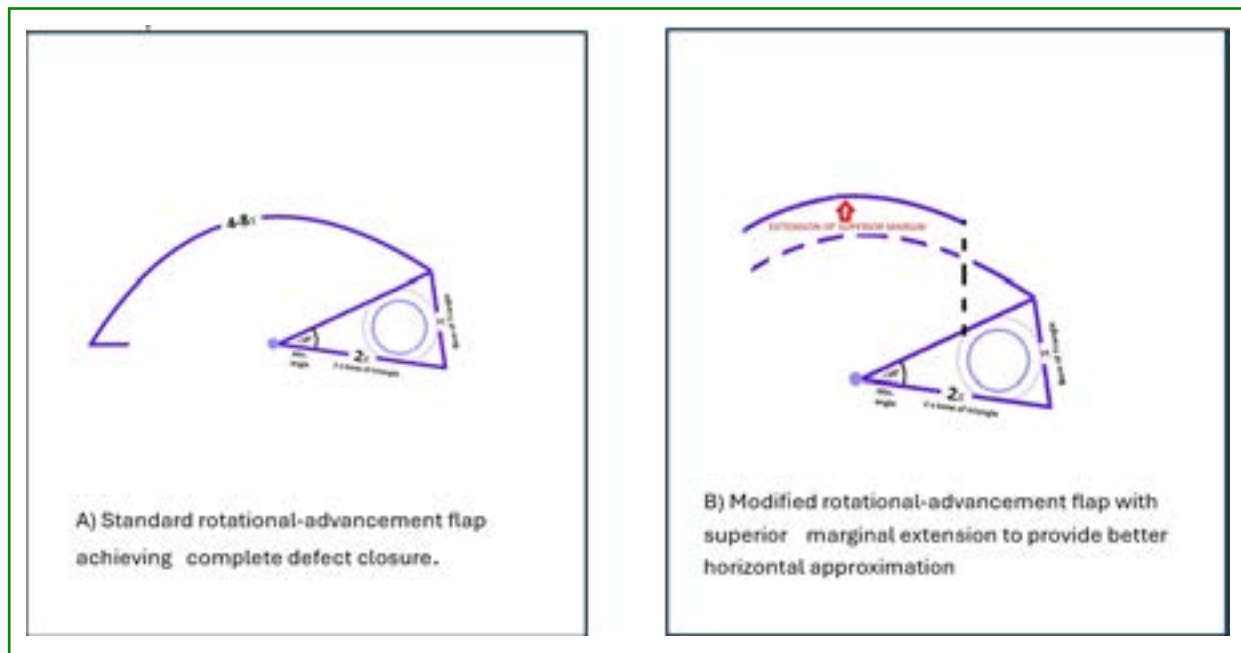
## Discussion

The reconstructive anatomy of the temporal unit is highly challenging due to a lack of local tissue laxity and an immediate proximity to highly vulnerable facial landmarks. In a 66-year-old patient, optimizing the overall surgical footprint and reducing operative time are just as vital as achieving structural closure.

The success of the Margin-Anchor Flap lies in rejecting the

traditional reconstructive axiom that every large surgical wound must achieve immediate, 100% primary adaptation. For expansive defects, forcing a total closure often causes severe anatomical distortions. This technique introduces a deliberate, bi-partite approach: the local flap performs the major structural work restoring subcutaneous volume to prevent temporal hollowing and sealing the mobile units while a small, strategically placed open area safely dampens the residual tension.

Extending the superior margin by  $>0.5\text{cm}$  provides the necessary rotational mobility to glide the flap smoothly into position. By anchoring the advanced dermis directly to the deep temporal fascia, the surgeon takes advantage of an exceptionally strong foundation. As documented in facial thread-lifting and SMAS plication procedures, anchoring to the deep temporal fascia provides superior structural fixation strength. In this case, that rigid fixation acts as a mechanical shield, absorbing the wound tension and completely isolating the periorbital and periauricular spaces from secondary contracture or downward pull.



Furthermore, the decision to leave the remaining micro-deficit adjacent to the permanent hairline is highly logical. The temporal scalp line is an established cosmetic blind spot where secondary intention yields flat, supple scars. Because the adjacent tissue is hair-bearing, the surrounding hair naturally drapes over and camouflages the final flat scar, entirely avoiding the unnatural lines or severe scarring alopecia that occur when a large rotation flap shifts the hairline. This hybrid combination ultimately eliminates the need for an autologous skin graft, avoiding a patchy,

depressed, or hyperpigmented texturing mismatch over the temporal bone.

## Conclusion

The Margin-Anchor Flap with intentional fractional closure is a reliable, tissue-sparing, and highly effective surgical modification for reconstructing large temporal defects. By prioritizing tensional isolation through deep fascial anchoring and utilizing strategic partial healing, this technique delivers

exceptional cosmetic outcomes, perfect preservation of the hairline, and uncompromised facial symmetry in elderly patients.

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