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RESEARCH ARTICLE

RECONSTRUCTION OF AN EXTENSIVE NASAL DEFECT USING A PEDICLED FOREHEAD FLAP AND NASOLABIAL FLAP IN A PATIENT WITH BASAL CELL CARCINOMA: A CASE REPORT

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Abstract

Background: Basal cell carcinoma is the most common cutaneous malignancy. Nasal location and infiltrative histology are high-risk features because of the potential for subclinical extension, incomplete excision, and local recurrence. Excision of extensive lesions may create defects involving several nasal subunits, requiring reconstruction with tissue that provides reliable vascularity and an appropriate color, texture, and thickness match.

Case presentation: A 92-year-old man with no relevant medical history presented with a lesion on the nasal dorsum that had been present for more than 5 years. Skin biopsy demonstrated solid infiltrative basal cell carcinoma. Examination revealed an infiltrated erythematous plaque with crusting, irregular poorly defined borders, and extension toward both medial canthi. Wide surgical excision was followed by immediate reconstruction using a pedicled forehead flap, a right nasolabial flap, and advancement of left nasal skin. During early follow-up of less than 30 days, the transferred tissues remained viable, with no clinically evident necrosis, infection, or wound dehiscence.

Conclusion: The combination of a pedicled forehead flap and a nasolabial flap provided complete early coverage of a large multi-region nasal defect using well vascularized locoregional tissue. Chronologic age alone should not preclude complex nasal reconstruction in appropriately selected older patients. Longer follow-up is required to assess definitive contour, nasal function, late complications, and oncologic recurrence.

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Introduction:-

Basal cell carcinoma (BCC) is the most common malignant skin tumor and usually follows a predominantly local course. Nevertheless, nasal location, poorly defined borders, large size, recurrence, and aggressive histologic patterns such as infiltrative, micronodular, morpheaform, and basosquamous subtypes increase the risk of subclinical extension and incomplete treatment. Contemporary European, National Comprehensive Cancer Network, and British guidelines recommend complete surgical removal as first-line therapy and favor micrographically controlled surgery for high-risk, recurrent, or anatomically critical lesions [1-3]. Reconstruction after oncologic

resection of the nose is challenging because the nose is a prominent three-dimensional structure with both aesthetic and respiratory functions. Planning should account for defect size, depth, involved aesthetic subunits, the status of the internal lining and structural framework, and the availability of adjacent tissue. The nasal subunit principle remains a useful framework for positioning scars within natural boundaries and restoring the characteristic convexities and concavities of the nose [4,5].

A pedicled forehead flap provides a broad, dependable source of vascularized tissue with a favorable color and texture match for large nasal defects. The nasolabial flap supplies mobile adjacent tissue and is particularly useful for the ala and lateral nasal wall. Although neither flap is universally superior, the two may be used in a complementary fashion when a complex defect spans multiple regions [6-10]. We report the reconstruction of an extensive nasal defect in a nonagenarian using a pedicled forehead flap, a right nasolabial flap, and contralateral local tissue advancement.

Case Presentation:-

A 92-year-old man was admitted electively for surgical treatment of biopsy-proven BCC of the nasal dorsum. He denied chronic medical conditions, allergies, regular medication use, previous operations, smoking, and alcohol consumption. The patient reported a lesion on the nasal dorsum that had been present for more than 5 years. He initially associated its appearance with local trauma and described occasional pruritus. A private dermatology evaluation included a skin biopsy, which demonstrated solid infiltrative BCC. Physical examination showed an infiltrated erythematous plaque with focal crusting, irregular poorly defined borders, and extension toward the medial periocular region and both medial canthi. Preoperative photographs documented the lesion and reconstructive markings (Figure 1). The lesion measured 5x7cm



Figure 1. Clinical presentation and reconstructive planning. Ulcerated and infiltrative lesion located on the root and dorsum of the nose, extending to the glabella and both medial canthi. The marking of the pedicled forehead flap is visible.

Given the histologic diagnosis, central facial location, and clinical extent, wide surgical excision with immediate reconstruction was planned. The definitive specimen confirmed infiltrative basal cell carcinoma. Information regarding tumor depth, perineural invasion, lymphovascular invasion, and final margin status was free of malignant cells. The post-excisional defect was extensive and involved the nasal dorsum, nasal root, upper lateral nasal walls, glabellar region, and bilateral medial canthal areas.

Surgical Technique:-

After written procedural consent, the operation was performed under general anesthesia. A pedicled forehead flap and a right nasolabial flap were marked. Following antiseptic preparation and sterile draping, the forehead flap was elevated and dissected while preserving its vascular pedicle, then rotated toward the nasal defect (Figure 2 a-c). The

forehead donor site was closed in layers with 2-0 polyglactin and 3-0 nylon. The flap was secured to the nasal dorsum with 4-0 polyglactin.

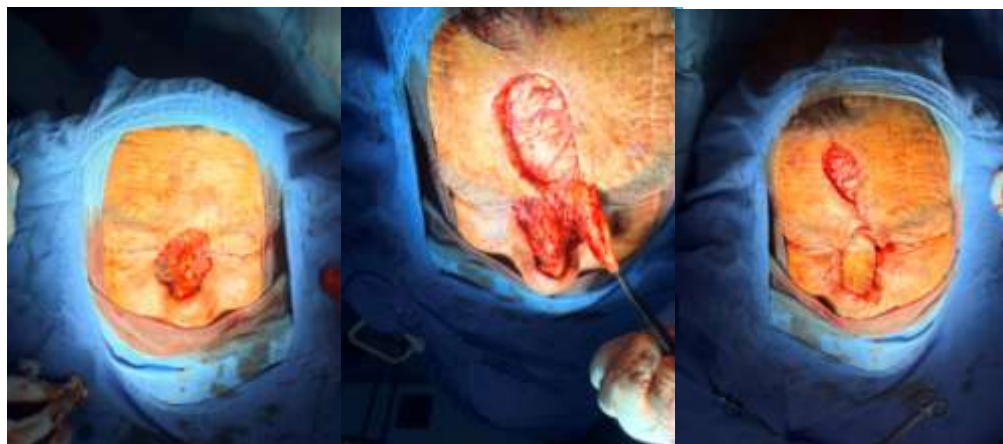


Figure 2. Intraoperative sequence of pedicled forehead flap reconstruction. (A) Extensive nasal defect following wide surgical excision of the lesion. (B) Elevation and dissection of the forehead flap with preservation of its vascular pedicle. (C) Rotation and initial inset of the flap over the central nasal defect before definitive fixation.

An incision was made in the left nasal ala, followed by elevation and advancement of local skin toward the left lateral nasal defect; the advanced tissue was fixed with 2-0 polyglactin. A right nasolabial flap was then incised, elevated, rotated superiorly, and secured to the right lateral nasal region with 4-0 polyglactin. Cutaneous closure was completed with 4-0 nylon (Figure3 a-b). Hemostasis and macroscopic tissue perfusion were confirmed. A nasal splint and sterile gauze dressings were applied.



Figure 3. Immediate postoperative appearance after nasal reconstruction. (A) Lateral oblique view showing inset of the pedicled forehead flap, closure of the forehead donor site, and preservation of the nasal contour. (B) Frontal view demonstrating complete coverage of the central and lateral nasal defect with the combined forehead and nasolabial flaps.

The immediate postoperative appearance demonstrated complete coverage of the central and lateral nasal defect and primary closure of the forehead donor site (Figure 4). During follow-up of less than 30 days, the forehead flap and local tissues remained clinically viable, with no evident flap necrosis, surgical-site infection, hematoma, or wound dehiscence. Early nasal contour and external airway configuration were preserved.



Figure 4. Early postoperative follow-up. Frontal view showing viable forehead and nasolabial flaps, preserved nasal contour, and satisfactory early wound healing without clinically evident necrosis, infection, or major dehiscence.

Discussion:-

This case involved a BCC with two major high-risk features: nasal location within the central facial high-risk zone and infiltrative histology. Current guidelines emphasize complete removal and recommend micrographically controlled surgery for high-risk lesions when available [1-3]. Accordingly, the final pathology report and documented margin status are indispensable for the oncologic interpretation of this case. The manuscript should not claim definitive tumor clearance or long-term control until these data and adequate follow-up are available.

The defect extended beyond a single small nasal subunit and required more than a simple linear closure, graft, or limited local flap. Reconstructive selection should not be based on diameter alone; depth, subunit involvement, lining, cartilage or bone exposure, and adjacent tissue mobility must also be considered [4,5]. The forehead flap is particularly valuable when substantial external cover is required because it provides a robust pedicle, a large skin paddle, and a close color and texture match [7]. Its disadvantages include a conspicuous temporary pedicle, forehead donor-site morbidity, bulk, and the usual need for staged division and refinement.

The nasolabial flap is a versatile source of local tissue for reconstruction of the nasal ala and sidewall. Its donor scar may be placed within the nasolabial fold, and it can be designed as an advancement, transposition, island, or interpolation flap depending on the defect [8]. A systematic review and meta-analysis of 2,036 followed patients found that nasolabial flaps were preferentially used for alar reconstruction, while reported rates of necrosis, hematoma, and bleeding were not clearly different from those of forehead flaps; however, the underlying evidence was mainly retrospective and heterogeneous [6].

For defects spanning several regions, combining locoregional flaps may distribute the reconstructive burden and allow each tissue source to be used where its characteristics are most advantageous. Krishnamurthy described a combined superiorly based nasolabial flap and paramedian forehead flap for a complex external nasal defect [9]. In the present case, the forehead flap supplied central dorsal coverage, while the nasolabial and contralateral nasal tissues completed lateral coverage. The contribution of the case therefore lies not in an entirely new flap, but in the practical application of complementary locoregional flaps to a large defect in a nonagenarian.

Forehead-flap reconstruction is commonly performed in two or three stages. A recent retrospective comparison found broadly similar outcomes between two-stage and three-stage approaches, apart from more dyspigmentation in

the three-stage group [12]. A 2026 systematic review and meta-analysis of seven retrospective cohorts and 428 patients likewise found no clear difference in infection, wound breakdown, necrosis, revision, or patient-reported satisfaction, although certainty was low and selection by defect complexity remained an important source of confounding [13]. Staging should therefore be individualized, and this case requires documentation of the timing and method of pedicle division.

Large database studies indicate that major complications after forehead-flap reconstruction are uncommon, although infection, bleeding, wound complications, and unplanned reoperation remain clinically relevant [14]. Careful hemostasis, avoidance of pedicle compression, appropriate donor-site closure, and structured postoperative surveillance are central to early flap safety.

Advanced age alone should not determine the reconstructive method. Kendler et al. reported forehead-flap reconstruction in patients aged 75 to 95 years without life-threatening complications [15]. Shumrick et al. similarly described complete flap survival and good-to-excellent outcomes in patients aged 80 years or older [16]. Selection should instead consider frailty, cognition, functional status, comorbidities, anesthetic risk, the ability to complete staged procedures, and the patient's goals.

The main limitations of this report are the follow-up period of less than 30 days, missing objective dimensions of the lesion and defect, incomplete documentation of the forehead flap pedicle and staging, absence of a validated aesthetic or patient-reported outcome measure, and lack of the definitive histopathology and margin status in the source material. The short follow-up precludes assessment of scar contracture, alar retraction, airway obstruction, contour asymmetry, medial canthal distortion, need for revision, and tumor recurrence. This report was drafted in accordance with the SCARE 2023 reporting framework for surgical case reports [17].

Conclusion:-

Combined reconstruction with a pedicled forehead flap, a right nasolabial flap, and local advancement of left nasal skin achieved complete early coverage of an extensive nasal defect after resection of infiltrative BCC. Complementary locoregional flaps may be useful when a defect spans multiple nasal regions and cannot be restored adequately with a single tissue source. In an appropriately selected older patient, chronologic age alone is not a contraindication to complex nasal reconstruction. The present result is preliminary. Definitive evaluation requires confirmation of negative histologic margins, documentation of flap staging, and medium- to long-term assessment of function, contour, complications, and oncologic recurrence.

Conflicts of Interest: The authors declare no conflicts of interest related to this manuscript.

Data Availability: Clinical data are retained in the institutional medical record and are not publicly available because of patient confidentiality.

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