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Treatment Approaches and Reconstruction with Nasolabial Flap in Nasal Vestibular Cancers

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ABSTRACT

Background: Nasal vestibule cancers are rare head and neck cancers. The aim of this study was to evaluate the age, gender, complaints, nasolabial flap (NLF), and reconstruction methods of patients diagnosed with nasal vestibule cancer in our clinic.

Methods: The demographic characteristics, localization of the lesion, size of the lesion, histopathological diagnosis, tumor stage, treatment, and reconstruction methods of patients who underwent surgery for nasal vestibular squamous cell carcinoma (SCC) between March 2019 and March 2023 were investigated. The tumor-node-metastasis staging system developed by the American Joint Committee for Cancer and the International Union for Cancer Control was used for tumor staging.

Results: Data of 10 patients with nasal vestibule cancer were obtained. All patients were male and the histopathological diagnosis of incisional biopsies was SCC. The mean age of the patients was 67.2 ± 8.7 years. The smallest lesion was 0.5 × 0.5 cm, and the largest was 3 × 4 cm. The tumors were clinically in T1 and T2 stages. All patients underwent surgical treatment. Reconstruction was performed bilaterally in 3 patients and unilaterally with a NLF in 7 patients.

Conclusion: A NLF can be used safely in the reconstruction of the defect after surgical resection in early stage nasal vestibule tumors because it is in the surgical field, there is no tissue color difference, it is an axial flap, and has acceptable aesthetic results.

Keywords: Nasal vestibule, nasolabial flap, reconstruction, squamous cell carcinoma

Introduction

Head and neck cancers rank sixth among all malignancies and account for 5% of cancer-related deaths. They are 10 times more common in men than in women. Ninety percent of head and neck cancers are mucosal in origin, and 95% are squamous cell carcinoma (SCC). They are generally seen in the fifth and sixth decades. Cancer of the nasal vestibule and columellar region accounts for less than 1% of head and neck malignancies.[1,2]

The nasal vestibule is the cartilaginous entrance region of the nose in the anterior part of the nasal cavity, bounded posteriorly and superiorly by the limen nasi. The nasal vestibule plays an important role in breathing, filtering macromolecules in the respiratory air, and aesthetic appearance of the nose. The skin is covered with multilayered flat non-keratinized epithelium. The mucosa contains numerous sweat glands, sebaceous glands, and hair follicles.[3,4]

Cancers of the vestibular region originate from the vestibular skin, columella, membranous septum, and nasal entrance area. Various cutaneous lesions such as basal cell carcinoma, SCC, melanoma, or adnexal tumors such as sebaceous carcinoma or eccrine carcinoma may develop in the vestibular region.[5] Squamous cell carcinoma in the vestibule often has a similar course to skin cancers and has a better prognosis than cancers of the nasal cavity.[6] Squamous cell carcinoma of the nasal vestibule has significant morbidity and mortality rates.

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Five-year recurrence-free survival rates range from 20% to 92%.[7,8] There are multiple staging systems for nasal vestibule tumors. The tumor-node-metastasis (TNM) staging system is the most useful and appropriate for determining prognosis and appropriate treatment follow-up.[9,10]

Treatment of vestibular cancers includes a wide range of surgical methods such as electrodissection with curettage, Mohs micrographic surgery, standard excision, and radiotherapy in the form of external or brachytherapy, or adjuvant radiotherapy after surgery, depending on the tumor stage.[11] Surgery should be preferred in cases where good cosmetic results can be achieved.[9] Grafts, local flaps, regional flaps, or free tissue transfers can be used in reconstruction. Local flaps include nasolabial flaps (NLF), perinasal island flaps, internasal vestibular flaps, and lip flaps.[12] The NLF is usually supplied by the angular artery, superior labial artery, and dorsal nasal artery. It can be applied as a single-session advancement and transposition flap or as a two-session interpolate flap.[13,14]

Material and Methods

The study was approved by the Samsun Research and Training Hospital (decision no.: SUKAEK-2023 5/11). The files of the patients were retrospectively analyzed. The study included 10 patients who presented to our clinic between March 2019 and March 2023 with complaints of wounds at the nasal entrance and epistaxis. Following head and neck examinations, contrast-enhanced paranasal and neck tomographies were ordered. Subsequently, an incisional biopsy was performed under local anesthesia in outpatient clinic conditions. The patients whose histopathologic evaluation report was consistent with SCC were invited back to the clinic for the treatment methods to be applied. Patients and their first-degree relatives were informed about the disease, treatment methods, and possible complications. All patients agreed to surgical treatment and possible adjunctive treatments, and written informed consent was obtained. General anesthesia preparations were completed for the patients whose consents were obtained. The patients underwent nasal vestibular mass excision and reconstruction with uni/bilateral NLF and neck dissection in the presence of clinical and radiological lymphadenopathy under general anesthesia. Since the histopathological diagnosis was SCC, a safety margin of at least 0.8-1 cm was left during surgery, and biopsies were taken from the permanent surgical margins. A triangular flap with its base cranially at the level of the nasal vestibule and its apex extending approximately 1 cm inferiorly from the level of the oral commissure was lifted. The lateral nasal wall was cut off at the base to lay the flap at the base of the nasal vestibule. After the NLF was laid at the base of the vestibule, the removed lateral wall was sutured over the flap (the epidermis layer in the projection was removed with a scalpel), and the lateral wall of the vestibule was formed again. Selective neck dissection (SND) was performed in patients with clinical and radiologic adenopathy in the neck. For reconstruction, a unilateral (Figure 1) or bilateral (Figure 2) NLF was performed according to the volume of the defect area. In bilateral NLF applications, nasal septal cartilage was used between the distal ends of the flap for columellar support, and columella was formed with a transfixion suture. No reconstruction was performed for septal defects posterior to the columella. No drain was placed in the field. Surgical resection and NLF application were performed by an ENT surgeon. Postoperative hospitalization continued for 3-5 days. According to the histopathologic reports of the surgical specimens, adjuvant radiotherapy was planned with the decision of the tumor council in patients with tumors 0.4 cm closer to the surgical margin. Wang[15] classification and Bussu et al[16] staging systems are available for nasal vestibule tumors. However, we used the more commonly used TNM staging system developed by the American Joint Committee for Cancer (AJCC) and the International Union for Cancer Control (UICC eighth edition). Recurrent cases, upper/lower lip surgery, malignant cases with a diameter of less than 0.5 cm, benign lesions, and non-SCC cases were excluded from the study.

MAIN POINTS

- *Nasal vestibule cancers are rare head and neck cancers.*
- *In our clinic, patients diagnosed with nasal vestibule squamous cell cancer underwent reconstruction with nasolabial flaps and the results were examined in this case series.*
- *Nasolabial flap is an axial flap and has acceptable aesthetic results.*

Results

A total of 10 patients diagnosed with nasal vestibule cancer were included in the study. The ages of the patients ranged from 57 to 85 years, with a mean of 67.2 ± 8.7 years. All patients were male and the histopathological diagnosis was HCC. The most common complaints of the patients were wounds at the nasal entrance and epistaxis. Neck and maxillofacial computed tomography showed no bone destruction in the maxilla in any patient (Figure 1).

Vestibular masses were located on the right in 3 cases, on the left in 4 cases, and bilaterally in 3 cases. Lesion sizes ranged from approximately 0.5 × 0.5 cm to 3 × 4 cm. Following mass resection, unilateral NLF were applied in 7 cases and bilateral NLF in 3 cases (Figures 2 and 3).

Postoperative adjuvant radiotherapy was performed in 2 patients whose tumor size approached 4 cm due to close surgical margins; these 2 patients had also undergone bilateral SBD (Table 1). Partial columellar necrosis developed distal to the flap in 1 of the patients who underwent bilateral NLF (Figure 4). Patients were followed up for a minimum of 5 and a maximum of 48 months with a mean follow-up of 15.4 months, and no recurrence/metastasis was detected.

Discussion

Nasal vestibular cancers are very rare, and the most common histopathologic features are SCC and basal cell carcinoma. The annual incidence of SCC of the nasal vestibule, according to Agger et al[17] was 0.32 per 100 000, while Dowley et al[7] reported the annual incidence as 0.19 per 100 000. In our study, histopathology of all of our cases was reported as SCC.

There are various treatment modalities for nasal vestibule tumors. Although surgery is the mainstay of local treatment for SCC, RT is the primary treatment for SCC when there is patient preference and obstacles to surgery.[11] Early stage vestibular tumors (T1 and T2) can be treated with either surgery or radiotherapy, but for advanced tumors such as T3 and T4, a multimodality treatment approach is appropriate, with surgery followed by radiotherapy. In some studies, radiotherapy has been recommended for early stage tumors and surgery is used as an alternative treatment when good cosmetic results can be guaranteed.[6-9] According to the analysis of surgical margins recommended by the American National Comprehensive Cancer Network, margins of 4 mm for well-circumscribed SCC less than 2 cm in diameter and 6 mm for lesions larger than 2 cm result in complete removal of tumoral

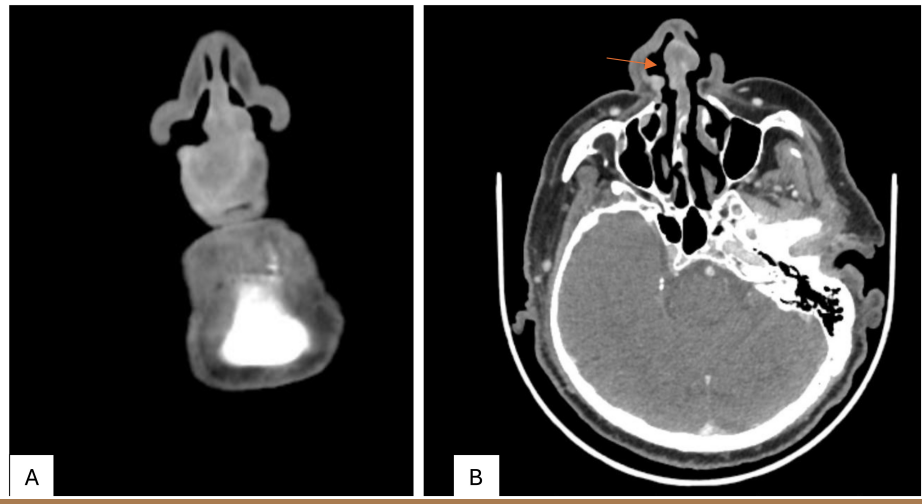

Figure 1. Coronal (A) and axial (B) images of a 4 × 3 cm mass originating from the nasal vestibule and extending posterior to the cartilaginous septum. Red arrow: nasal vestibule localized mass.

tissue in more than 95% of cases.[18] Brodland et al[18] set a safety margin of 4 mm for low-risk tumors of the skin and 6 mm for high-risk tumors. Corrado et al[19] reported that they left at least a 1 cm safety margin in 20 cases of recurrent vestibular tumor surgical treatment. In our series of 10 patients with early stage vestibular SHC, surgical excision was performed with a safety margin of approximately 1 cm. In 2 cases, postoperative adjuvant radiotherapy was performed because the nasal spine base surgical margin was positive.

Although the regional incidence of disease varies in squamous cell tumors of the nasal vestibule, elective neck dissection is generally not recommended. Talmi et al[5] reported the incidence of concurrent and delayed lymph node metastasis in patients with nasal vestibule tumors to be between 3% and 40%. In our case series, clinical lymph node involvement was detected in only 2 patients and SBD was performed. However, no metastatic lymph node was detected histopathologically.

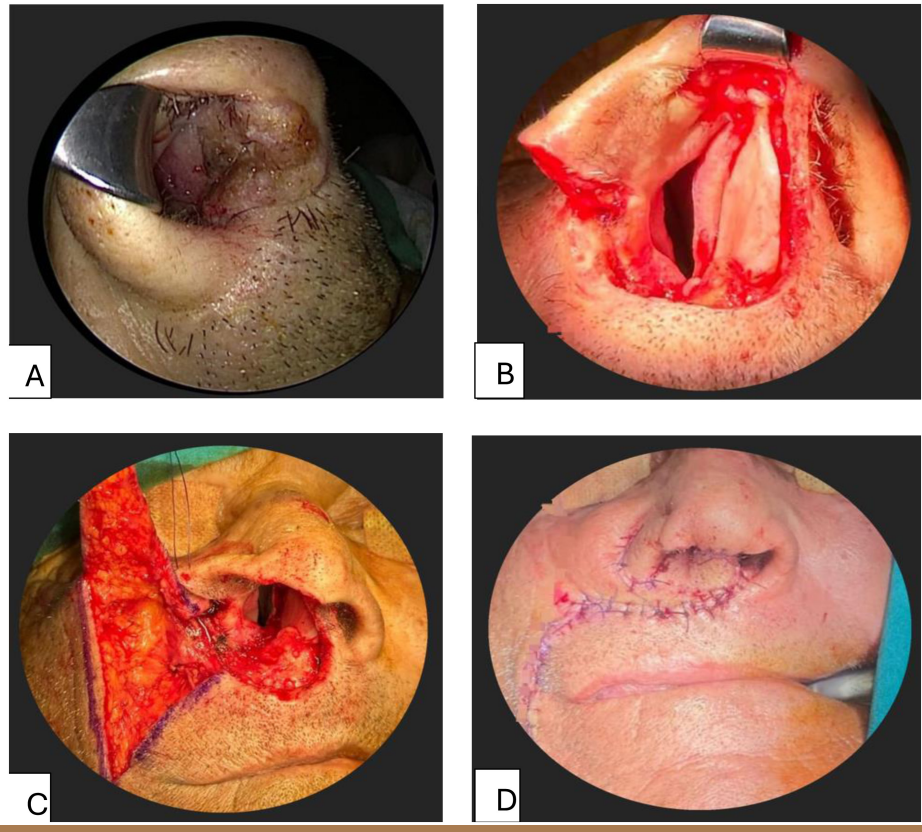

Figure 2. A. Mass in the right nasal vestibule. B. Defect area after excision of the mass. C. Right nasolabial flap created for reconstruction. D. Placement of the flap in the defect area.

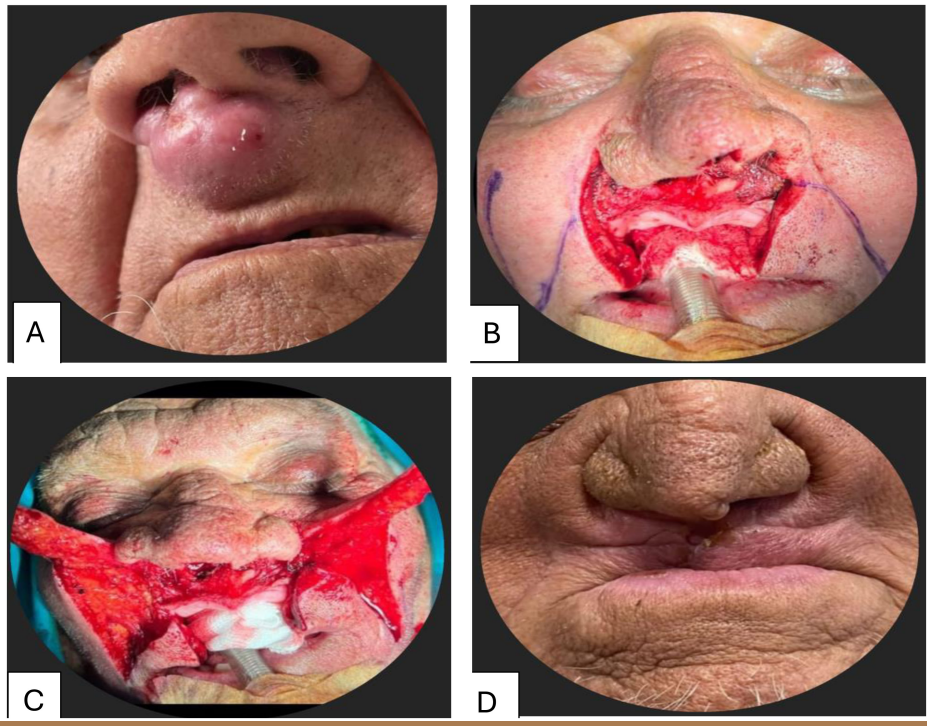

Figure 3. A. Mass in the nasal vestibule. B. Defect area after excision of the mass. C. Bilateral nasolabial flaps created for reconstruction. D. Image after placement of the flaps postoperative at the third month.

The nasal vestibule region is a difficult area to reconstruct with satisfactory aesthetic results.[20] When selecting reconstruction flaps, attention should be paid to the size and depth of the defect and the nasal subunits involved.[12] Small superficial tumors of the nasal vestibule can be left to secondary healing after resection or reconstructed with a full-thickness skin graft.[9] Small full-thickness defects without bone involvement can be reconstructed with a NLF.[21] The NLF is usually supplied by the angular artery, superior labial artery, and dorsal nasal artery.[22] It can be performed as a single-session advancement and transposition flap or as a two-session interpolated flap. Bilateral NLF can be used in upper lip, vermillion, filtrum, nasal floor, columella, and membranous septum defects without bone loss.[13,14] The most important advantage of local flaps is that the donor and defect areas are similar in color, thickness, and skin structure, which is cosmetically important. Faenza et al[23] reported that the use of bilateral NLF allows rapid and effective reconstruction of defects related to the columella and upper lip, and allows patients to return to their normal lives quickly.

We performed unilateral NLF reconstruction in 7 of our cases and bilateral NLF reconstruction in 3. In 1 case with bilateral NLF, partial

Table 1. Demographic Characteristics, Tumor Size, and Treatment Modalities of the Patients

Sociodemographic Characteristics (Age/Gender)	Tumor Localization (Side/Involvement)	Tumor Size	Grade	Treatment Methods
63/Male	Left vestibule lateral wall involved	1 × 1 cm	T1	Tumor excision + left NLF reconstruction
85/Male	Left and right columellar involvement extended to septum and philtrum	3 × 4 cm	T2	Tumor excision + bilateral NLF reconstruction + radiotherapy
65/Male	Left vestibule base, medial wall and columella involved extended to philtrum	3 × 2 cm	T2	Tumor excision + bilateral SND + bilateral NLF reconstruction
70/Male	Right vestibule medial wall involved	1 × 1 cm	T1	Tumor excision + right NLF reconstruction
58/Male	Left vestibule medial wall and base involved	2 × 1 cm	T2	Tumor excision + left NLF reconstruction
61/Male	Left vestibule medial wall and base involved extending to lateral wall	2 × 2 cm	T2	Tumor excision + left NLF reconstruction
75/Male	Columella involved extended to septum and philtrum	3 × 4 cm	T2	Tumor excision + bilateral SND + bilateral NLF reconstruction + radiotherapy
57/Male	Left vestibule base	0.5 × 0.5cm	T1	Tumor excision + left NLF reconstruction
64/Male	Right vestibule medial wall	0.5 x 0.5 cm	T1	Tumor excision + left NLF reconstruction
74/Male	Right vestibule medial wall	3 × 3 cm	T2	Tumor excision + right NLF reconstruction

NLF, nasolabial flap; SND, selective neck dissection.

Figure 4. Partial columellar necrosis distal to the flap in a patient with bilateral NLF.

necrosis developed distal to the flap in the columellar region, and acceptable aesthetic results were obtained in the other 8 patients.

In early stage nasal vestibule tumors, treatment planning should consider the patient's age, comorbidities, and preference. Even if the nasal vestibule tumor is in the early stage, the closure of the defect is important for functional and cosmetic reasons. The nasal vestibule region is a difficult area to reconstruct and provide acceptable aesthetic results. A NLF can be used in the reconstruction of surgically treated patients because it is in the same surgical field, offers color matching, adequate flap nutrition, and acceptable aesthetic results. Since vestibular tumors are rare, more studies are needed to better manage the disease process.

Data Availability Statement: *The data that support the findings of this study are available on request from the corresponding author.*

Ethics Committee Approval: *Approval for the study was granted by the Ethics Committee of Samsun Research and Training Hospital (decision no.: SUKAEK-2023 5/11).*

Informed Consent: *Written informed consent was obtained from the patients and their first-degree relatives who agreed to take part in the study.*

Peer-review: *Externally peer-reviewed.*

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