



# Prevalence of nasal reconstruction techniques used over the past four years at the Plastic Surgery Service of Ceará

*Prevalência das técnicas de reconstrução nasal utilizadas nos últimos quatro anos em serviço de Cirurgia Plástica do Ceará*

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## ■ ABSTRACT

**Introduction:** Nasal skin lesions are significant in plastic surgery because of the difficulty of aesthetic and functional reconstruction. Central position of the nose on the face, and its structure, rigid architecture, and low mobility are among the possible causes. Several techniques used to correct nasal defects have been documented since the origins of plastic surgery. We evaluated retrospectively and analyzed the main surgical techniques and their indications in cases of nasal reconstruction performed at the Plastic Surgery Service of Ceará over a period of 4 years. **Methods:** This was a retrospective clinical study including 151 patients who underwent resection of nasal lesions from January 2010 to December 2014 at a public hospital in Fortaleza. Variables included were sex, age, and surgical technique. **Results:** Most of patients were men with a mean age of 63.2 years, they accounted for 52.3% of the sample. The main reconstruction forms were primary suture (28.5%), rotational flap (22.5%), bilobate (14.6%), advancement flap (8.6%), nasogenian (6%), frontal (4.7%) and skin graft (15.2%). **Conclusion:** Because of the different nasal reconstruction possibilities, the surgical technique choice, after resections, should consider defect location and size, contour and nasal anatomy for a better aesthetic and functional result. At our service, reconstruction with primary lesion synthesis was predominant with a slight predominance among men and older patients. Other techniques were used given the preference for better aesthetic and functional result for each patient.

**Keywords:** Rhinoplasty; Surgical flaps; Grafts.

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## ■ RESUMO

**Introdução:** As lesões cutâneas nasais são de grande importância para o cirurgião plástico em virtude da dificuldade em se promover reconstruções estéticas e funcionais quando da ressecção das mesmas. Várias técnicas tem sido descritas para se corrigir um defeito nasal, sendo documentadas desde os primórdios da cirurgia plástica. **Métodos:** Foi realizado um estudo clínico retrospectivo de uma série de casos consecutivos de cento e cinquenta e um pacientes submetidos a ressecção de lesões nasais no período de janeiro de 2010 a dezembro de 2014 em hospital público de Fortaleza. Foram analisadas as variáveis sexo, idade, técnica cirúrgica. **Resultado:** Do total de prontuários analisados, a maioria dos pacientes era do sexo masculino correspondendo a 52,3%, com idade média de 63,2 anos. As principais formas de reconstrução foram a sutura primária (28,5%), retalho de rotação (22,5%), bilobado (14,6%), retalho de avanço (8,6%), nasogeniano (6%), médio frontal (4,7%) e enxerto (15,2%). **Conclusão:** Diante das inúmeras possibilidades de reconstrução nasal conclui-se que a escolha da técnica cirúrgica utilizada após as ressecções deve levar em consideração a localização e tamanho do defeito, contorno e anatomia nasal para um melhor resultado estético e funcional de cada paciente. Em nosso serviço predominou a reconstrução com síntese primária da lesão ocorrendo leve predomínio em pacientes do sexo masculino e idosos. Outras técnicas foram utilizadas priorizando-se o melhor resultado estético e funcional para cada paciente.

**Descritores:** Rinoplastia; Retalhos cirúrgicos; Enxertos.

## INTRODUCTION

Nasal skin lesions are of great significance in plastic surgery, due to the difficulty of aesthetic and functional reconstruction. The central position of the nose in the face, and its structure, rigid architecture, and low mobility are among the possible causes.

Several techniques have been described to correct nasal defects, and have been documented since the origins of plastic surgery. These date back to 3000 B.C. and ancient Egypt, as reported in the Edwin Smith surgical papyrus<sup>1</sup>, and the descriptions of total reconstruction related by the priest Susruta in 600 B.C. in ancient India, in his text of Ayurveda<sup>2</sup>. These procedures subsequently evolved with Burget and Menick<sup>3</sup>, who introduced the concept of nasal aesthetic subunits and modified the form of treatment of this region. Loss of nasal substance is mainly due to tumor resection and trauma<sup>4</sup>.

In Brazil, non-melanoma cancer in 2014 accounted for 182,000 new cases<sup>5</sup>, and basal cell carcinoma (BCC) was the most frequent nasal lesion. During reconstruction, we must take into account the variables involved, in order to perform this procedure with more aesthetic and functional quality. The size of the lesion

that will be resected, location, anatomical knowledge of the nose, lateral subunits, wing, back, tip, roof, and the differences in elasticity, color, contour, and texture of the skin should be considered.

## OBJECTIVE

The aim of this study was to retrospectively evaluate cases of nasal reconstruction that were performed at the Plastic Surgery Service of Walter Cantídio University Hospital, in Fortaleza, CE, over a period of 4 years. The main surgical techniques and their indications were analyzed, and a literature review was conducted.

## METHODS

We conducted a retrospective clinical study of a series of 151 consecutive patients who underwent resection of nasal lesions between January 2010 and December 2014 at the Plastic Surgery and Reconstructive Microsurgery Service of Walter Cantídio University Hospital, in Fortaleza.

The study was performed by reviewing charts, for analysis of gender, age, and surgical technique variables. Medical records lacking data required for the evaluation

were excluded from the study. This study was approved by the Ethics Committee of Walter Cantídio University Hospital, under the number 1.457.253.

## RESULTS

Of the charts analyzed, 52.3% were those of male patients (Figure 1). The ages ranged from 14 to 82 years. The average age of the study group was 63.2 years. The main forms of reconstruction (Figure 2) were primary suturing (28.5%); rotational (22.5%), bilobed (14.6%), advancement (8.6%), nasolabial (6%), and middle frontal flaps (4.7%); and grafting procedures (15.2%).

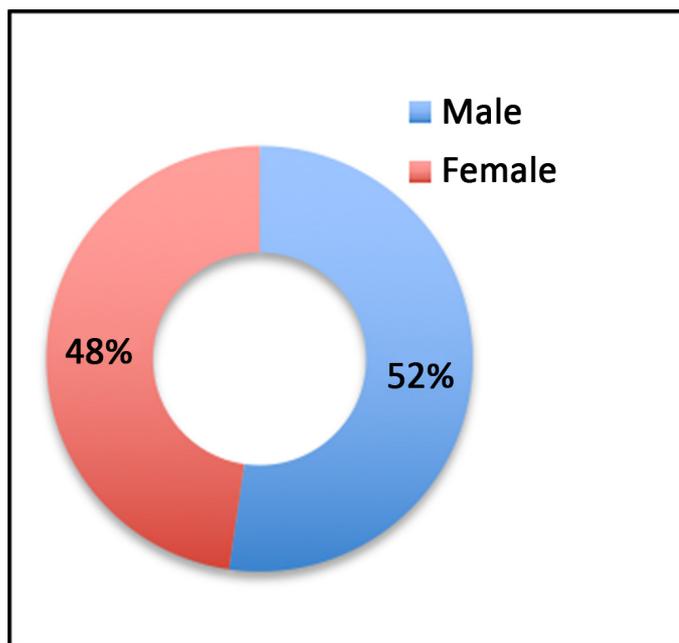


Figure 1. Gender.

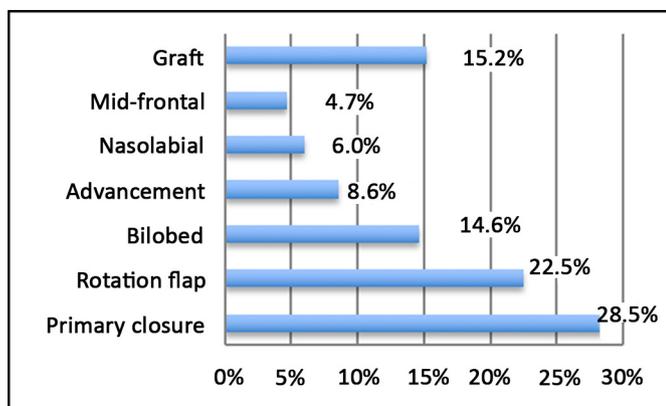


Figure 2. Types of reconstruction.

## DISCUSSION

Reconstructive procedures after resection of nasal lesions are a challenge in plastic surgery. A satisfactory

functional and aesthetic outcome will depend on factors such as the age of the patient and the size and location of the surgical defect. Anatomical knowledge of the nose is fundamental to selection of technique.

Several alternatives have been proposed to repair nasal defects, including skin and composite grafting; bilobed, rhomboid, Rieger's, advancement, frontal, and nasolabial flaps; and microsurgical transplants<sup>6</sup>. Each choice uses specific criteria and each option has its own indications, advantages, and disadvantages.

A higher rate of nasal reconstructions was performed in patients with more advanced age (average: 63.2 years), due to the higher incidence of non-melanocytic neoplasms of the skin<sup>1</sup>. In elderly patients, the incidence was consistent with that of other studies<sup>4</sup> and the statistics published by the National Cancer Institute in 2014<sup>5</sup>.

The higher incidence in male patients (52%) (Figure 1) is consistent with the prevalence of non-melanoma skin cancers reported in Brazil in 2014<sup>5</sup> (54% in males), since the vast majority of nasal lesions on our service were due to tumor resection and referred from other clinics. Only a minority were caused by trauma.

In the present study, primary reconstruction was the technique most commonly used (28.5%). The relatively high number of primary reconstruction cases implies that most of the lesions were small. A large number of cancer patients were referred for small lesion resection.

Primary reconstruction was used for defects as large as 1.5 cm, located mostly in the midline. This implies lateral detachment, i.e., a procedure that can lead to asymmetry. However, according to Pitanguy and Treciak<sup>7</sup>, a cartilaginous framework that appears intact does not lead to definitive deformity (Figure 3).

A bilobed flap was performed in 25 patients; this is a random and versatile flap, allowing easy transfer of skin from elastic areas. This procedure is very useful for the treatment of small defects. Initially described by Esser, the technique relies on a double transposition and single pedicle flap. While the first flap is transposed into the defect, a second and minor flap is transposed to fill the secondary defect caused by the major flap. This allows distribution of tension forces in several directions, while reducing distortions and skin redundancies generated by a simple transposition flap or primary closure<sup>8</sup>.

Flexible planning allows mobilization of skin from areas that are adjacent to the nasal tip, preferably the lateral dorsum. Planning should be precise to avoid skin redundancies. The best results are obtained when the donor area is located between the dorsum and chin, where scars are less visible, and when it is designed at an angle of 90° between the defect and secondary flap<sup>7</sup>.

In a study by Collar et al.<sup>9</sup>, the bilobed flap was indicated for the reconstruction of the nasal tip in lesions



Figure 3. Primary reconstruction.

up to 2 cm, caused by the loss of cutaneous substance (Figure 4).



Figure 4. Bilobed flap.

In the Plastic Surgery Service, nasal tip lesions larger than 2 cm are referred for reconstruction using a mid-frontal flap (4.7% of the cases), while rotation flaps are used in lesions smaller than 2 cm (22.5%). This is due to the high efficiency of Indian flaps in larger nasal reconstructions<sup>6</sup>. However, smaller lesions are reconstructed with local rotation flaps.

This flap is also used for the loss of substance involving more than one aesthetic unit and for defects affecting the cartilage and/or mucosa. Its donor area allows the creation of a flap measuring up to 5 cm wide, without the need of previous expansion for primary closure<sup>10</sup>, in addition to providing skin that closely resembles that of the nose. However, a disadvantage is the need for two or more operations, in order to obtain an acceptable final result (Figure 5).

For relatively larger defects affecting the nasal ala and lateral wall, we used the nasolabial flap, which



Figure 5. Paramedian flap.

enables coverage of larger lesions due to a good blood supply, redundant skin<sup>11</sup>, and little damage to the donor area, since the scar is placed in the nasolabial groove.

The nasal ala is a subunit with little skin availability; it is fixed to cartilage and benefits from this form of reconstruction. The flap can be performed on the superior or inferior base, with the availability of the angular, infraorbital, transverse facial, and infratrochlear arteries for vascular supply. Disadvantages include the use of donor skin with different color and thickness, and the tendency to deform after sectioning of the pedicle, thus often requiring refinement<sup>12</sup> (Figure 6).



Figure 6. Nasolabial flap.

In the present study, grafts (15.2%) were indicated only in exceptional cases, in which it was not possible to ensure complete tumor resection. These were also indicated when the resection of skin tumors was carried out multiple times due to relapse. We always chose to use full-thickness skin grafts from nearby regions (preauricular, retroauricular, or supraclavicular), to reduce secondary retraction and discoloration<sup>13</sup>.

This option ensures a quick and simple solution for patients with high surgical risk or lesions with high probability of recurrence<sup>14</sup>. The main disadvantages include scar retraction, interference with the flap-valve mechanism, hyperpigmentation, and surface irregularities caused by the lesser thickness of the graft in relation to the adjacent skin. We always use Brown's dressing (Figure 7).



Figure 7. Skin graft.

## CONCLUSION

In our service, primary reconstruction was somewhat more frequent in male and elderly patients. We also used other techniques, since the best outcome for each patient takes priority. Loss of substance in the nasal region is still a challenge to the plastic surgeon.

Given the numerous possibilities for nasal reconstruction, the surgeon should be aware of all options, according to each type and lesion location. This study shows that the choice of the surgical technique should take

into account the lesion location, size of the defect, contour, and nasal anatomy, in order to obtain a better aesthetic and functional outcome.

## COLLABORATIONS

**WAM** Analysis and/or interpretation of data; statistical analysis; conception and design of the study; completion of surgeries and/or experiments; writing the manuscript.

**SGPP** Final approval of the manuscript; critical review of its contents.

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