Use of aesthetic rhinoplasty procedures in reconstructive nasal surgery

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Abstract

Resection of cancer often involves the excision of underlying hard tissue, and some procedures in aesthetic rhinoplasty can be used in reconstructive nasal surgery to increase the margin of safety while still achieving an acceptable aesthetic and functional outcome. We have used techniques from aesthetic rhinoplasty to shape the nasal framework. Osteotomy and formation of the tip were used in 17 patients with defects (ranging from 1 to 3.5 cm in size) from the nasal root to the tip of the nose. After the underlying bony or cartilaginous framework, or both, had been removed, the resulting open roof deformity had to be corrected by osteotomy of the bony nasal wall and the tip shaped by excision and suturing, including insertion of the tip graft and columellar strut graft. After this, and narrowing of the nose, the defect was smaller and could be closed with local tissue without tension. There were no deformities in the contour, and patency of the airway was maintained. Patients were satisfied with both the aesthetic and functional results. Although the margin of safety was increased, shaping the nasal framework reduced the size of the defect, which allowed tension-free closure with a local flap. The operation requires a thorough knowledge of procedures used in aesthetic rhinoplasty.

Keywords: Tumour excision; Hump removal; Osteotomy; Tip-forming; Local flap

Introduction

Nasal reconstruction has always been a challenge for reconstructive surgeons, and the use of a local flap provides the best options for colour, texture, and thickness. A successful reconstruction of the bony and cartilaginous scaffold should achieve a harmonious appearance.

A simple improvement in the nasal contour can have an appreciable impact on the overall appearance of the nose and on the patient’s self-confidence. Refinements have been suggested to minimise any noticeable deformity,1,2 but the complexity of nasal contours is a challenge that demands the refinement of existing procedures.3,4 During past decades there have been considerable advances in reconstructive surgery. Existing methods have been refined and new methods have been developed, including the use of microsurgical tissue transfer.5-8 The introduction of aesthetic nasal “subunits”, although controversial, has contributed greatly to these refinements.9-12

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Fig. 1. Left lateral view of a 58-year-old woman after excision of a basal cell carcinoma from the tip of her nose (published with the patient’s permission).

Many variables, including the size and site of the defect, the shape of the nose, and the laxity of the covering skin, are important determinants of the choice of reconstructive technique. Osteotomy of the nose is an essential step in aesthetic rhinoplasty to correct an open deformity of the nasal roof and an irregular nasal wall, or to narrow the width of the nasal base.\textsuperscript{13} Many procedures have been developed to shape the tip of the nose.\textsuperscript{14,15} Excision of the tumour and raising a flap permit wide exposure of the nasal bones and cartilage. This allows exact manipulation of the nasal framework under direct vision.

Here we present our clinical experience in the adjustment of the nasal framework after excision of a tumour using osteotomy and tip-forming techniques. The method was used to increase the margin of safety and reduce the size of the nasal defect to allow primary closure of the residual defect.

Patients and methods

We studied 17 patients with malignancies of the nose (7 men and 10 women, mean age 65 (range 37–83) years). After resection of the tumours with clear margins, the size of the defects, which were on the nasal dorsum from the base to the nasal tip, ranged between 1 and 3.5 cm. This included resection of the underlying bony or cartilaginous (or both) framework of the nose. For 5 patients we used unilateral or bilateral advancement flaps from the cheek. Four had bilobed flaps. We chose tissue from the nasal dorsum for 8 patients (Figs. 1 and 2). Tension-free closure was achieved satisfactorily in all. We used a nasal osteotomy to correct the open roof deformity, a large carbide burr was used to flatten the nasal base, and a small diamond burr was used for the lateral osteotomy. The procedure was done under local anaesthesia in 9 patients, and under general anaesthesia in 8.

Fig. 2. Photograph of the same patient after excision of the tumour with an adequate margin of safety. The design of the flap is marked on the dorsum of the nose (published with the patient’s permission).

Results

A good aesthetic outcome was achieved in all 17 patients with no major complications. In the cases where an advancement flap from the cheek was considered, secondary debulking was required to improve the nasolabial region. An open roof deformity, resulting from removal of the hump (Fig. 3), was corrected by lateral osteotomy of the bony nasal wall (Fig. 3). The osteotomy was easily done with a diamond burr after the planned local flap had been dissected. This allowed accurate and precise control of the path of the osteotomy and the positioning of the bony lateral wall under direct vision. This approach allows various types of nasal osteotomy – lateral, medial, or transverse – as necessary.

The osteotomy line was smooth and allowed a predictable split exactly as planned, and there were no unfavourable or comminuted fractures. The infracturing was achieved by gentle pressure with the fingers. The stability of the nasal wall was maintained and tearing of the nasal mucosa avoided.

Fig. 3. After flap dissection, excision of the hump, and lateral osteotomy made with a diamond burr.
Lateral osteotomy, followed by digital infracturing, narrowed the width and reduced the size of the defect. In addition, the reduction of the cranial part of the lower lateral cartilage and the tip-suturing techniques that we used also reduced the size. These procedures allowed the tension-free reconstruction of the defect by local procedures (Fig. 4a–c). All patients were satisfied with the result, whereas preoperatively they had been anxious about a possible deformity.

Discussion

Nasal reconstruction comprises controlled changes in the skeletal support structures and the soft tissue envelope to achieve the desired results. Improvement in the nasal contour has an appreciable favourable impact on the patients’ overall appearance and self-confidence. There has been an increasing demand for optimal aesthetic and functional outcomes, so various techniques have been suggested for replacement of the soft tissue lost after resection of the cancer, depending on the size and site of the defect and the tissue involved. Advances have been made during the past decade to achieve the best possible results in reconstructive rhinoplasty. Burget and Menick introduced the “subunits” philosophy to improve the aesthetic outcome. Use of the nasal mucosa has also optimised the result of reconstruction in perforated defects. Nevertheless, there is a need for further improvement in the results, and simplification of the procedure.
A small residual deformity of the nose can be seen, but even a small improvement can have a favourable impact on the patient’s quality of life. If the principles of aesthetic and functional nasal surgery are followed, it can result in an outstanding repair, so the use of the appropriate technique will help to achieve the desired result.

Skeletal support of the nose provides the main aesthetic and functional requirements of nasal reconstruction. It is the framework that provides the support and shape of the covering soft tissue, and the restoration of the nasal contour is integrally related to the composition and design of the nasal framework. The principles of reconstruction of the skeletal support are similar to those of aesthetic rhinoplasty, and we have shown the importance of different techniques that are commonly used in aesthetic rhinoplasty to shape the nasal framework. In addition, these techniques can be used to reduce the size of the defect, allow easier replacement of tissue, and help to increase the margin of safety.

An alteration in the width of the nose by lateral osteotomy, which is a usual part of aesthetic rhinoplasty, can be used in reconstructive nasal surgery. It is an integral part of rhinoplasty, and can be used to reshape the lateral contour, narrow the base, realign the dorsum, and correct an open roof deformity. Various methods and instruments have been introduced for this purpose. The osteotomy should be controllable, predictable, and easy to do.

Depending on the site of the tumour, bone or cartilage from the dorsum or cartilage from the nasal tip has to be sacrificed to increase the margin of safety. This may lead to an open roof deformity, which can be corrected by osteotomy of the nasal wall. Once the soft tissue cover of the nose has been dissected to close the defect, the osteotomy can be made under direct vision, which is controllable and precise with a limited potential for complications such as damage to the surrounding soft tissue. It can be done with an appropriate surgical burr. Tip-forming techniques used in aesthetic rhinoplasty can also help to shape the nasal tip, reduce the size of the defect, and achieve an adequate margin of safety.

After the lateral nasal wall is in position, various local flaps can be used to close the defect without leaving a visible deformity. We have been using these procedures, including osteotomy and tip-forming techniques, as an important adjunct to other techniques in reconstructive nasal surgery to improve the result.

Because the osteotomies were made under direct vision, they could be made exactly along the planned path. The use of a diamond burr allows the required osteotomy to be made exactly and easily – lateral, median, or transverse – without damaging the nasal mucosa or causing a comminuted fracture pattern. We encountered no irregularities of the dorsum, the nasal wall did not collapse, and there were no unwanted fractures, which can cause comminuted fractures and spicules. The establishment of the normal sub-surface architecture of the nose is essential to improve the definition of nasal landmarks, even if the missing anatomy has been precisely duplicated. An adequate local flap with sufficient mobilisation and narrowing of the hard-tissue reduces the tension and improves the accuracy of the insertion of the flap. A soft tissue envelope similar in appearance to the surrounding skin creates the visual impression of normality. The patient’s preoperative fear of having a deformed ugly nose could be changed to postoperative satisfaction, so we were able to help to relieve the problems of excision of a cancer. Even the relatives were astonished.

We conclude that the techniques of aesthetic rhinoplasty, from osteotomy of the nasal wall to formation of the tip, are useful refinements that can optimise the outcome of reconstructive nasal surgery.

Conflict of interest

We have no conflict of interest.

Ethics statement/confirmation of patient’s permission

The patient has given us permission to publish the photographs.

We have no financial interest and we did not have any financial or material support concerning this study.

References