C A S E R E P O R T

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Reconstruction of the columella and the tip of the nose with an island-shaped forehead flap

Rekonstrukcija kolumele i vrha nosa ostrvastim čeonim režnjem

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Abstract

Background. Posttraumatic and postoperative defects of columella and the tip of the nose are difficult to reconstruct. There are several operative methods described in the literature, and many of them are step-by-step procedures with long duration. The aim of this study was to present one-step procedure for reconstruction of the columella and the tip of the nose with island-shaped arterial forehead flap. **Case report.** A 45-year old man was submitted to surgical excision of basocellular skin cancer. After the excision, a defect of the columella and tip of the nose the remained, 3 × 2.5 cm in dimensions, with exposed alar cartilages. During the same operation, the defect was covered with an island-shaped arterial forehead flap. Postoperative one-year course was uneventful, without signs of tumor recurrence after one year, and further surgical corrections were unnecessary. **Conclusion.** Considering the results of our operative technique, we believe that middle island-shaped forehead flap is suitable for reconstruction of the columella and the tip of the nose, due to the following reasons: safe vascularization of flap, similarity of the transferred tissue with the excised one, the procedure is completed in one step, simple surgical technique and uncomplicated healing of a flap-harvesting site.

Key words:
skin neoplasms; reconstructive surgical procedures; nose neoplasms; treatment outcome.

Apstrakt

Uvod. Posttraumatski i postoperativni defekti kolumele i vrha nosa su teški za rekonstrukciju. Ima više opeativnih metoda opisanih u literaturi. Većina njih su višeaktovne i obavljaju se korak po korak. Cilj ovog rada bio je da se prikaže jednofazna procedura rekonstrukcije kolumele i vrha nosa primenom ostrvastog arterijalnog čeonog režnja. **Prikaz bolesnika.** Bolesnik, star 45 godina, bio je podvrgnut hirurškom uklanjanju bazocelularnog karcinoma kože. Posle hirurške intervencije ostao je defekt veličine 3 × 2,5 cm na kolumeli i vrhu nosa sa eksponiranom alarnom hrskavicom. Tokom operacije defekt je pokriven ostrvastim arterijskim čeonim režnjem. Postoperativni tok u narednih godinu dana bio je bez komplikacija, bez znakova recidiva tumora, te dalje hirurške korekture nisu bile potrebne. **Zaključak.** Na osnovu rezultata hirurške tehnike koju smo primenili možemo zaključiti da je ostrvasti čeoni režanj pogodan za rekonstrukciju kolumele i vrha nosa jer ima pogodnu vaskularizaciju, tkivo mu je slično uklonjenom, a procedura se obavlja u jednoj fazi, hirurška tehnika je jednostavna i postoperativni tok je bez komplikacija.

Ključne reči:
koža, neoplazme; hirurgija, rekonstruktivne procedure; nos, neoplazme; lečenje, ishod.

Introduction

Reconstruction of the nose is one of the oldest operations of its kind, but it is still a challenge to surgeons because of the complex anatomy of the nose and its functional and aesthetic importance [1–6]. A number of studies on this issue have shown that the tip of the nose, especially columella are the most complex structures for reconstruction, because of their specific localization [7–15].

Isolated defects of the skin at the tip of the nose are usually covered by local skin flaps. Collumella defects may be partial or total, also associated with defects of adjacent structures [10–16]. The literature describes numerous reconstructive methods. According to existing records, the first reconstruction of the columella was done by Diefenbach in 1833 when he applied a skin flap from the upper lip. This method was later modified several times [9]. Then Joseph published the results of reconstruction of the columella by chon-

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drocutaneous transplant, and as giving region he used the nasal wing. Others were applying composite graft from auricle or mastoid region [17]. Other reconstructive methods were also described: nasolabial flaps [18–21], flaps of the lower lip, frontal lobes [22–27], dermal or fascial flaps from the dorsum of the nose, skin flaps from the nasal wings or from the nasal vestibule and the nasal septum [28], cheek flaps, or tubule or island-shaped flaps from the neck regions, periauricle flaps, scalp flaps, a skin tubule from the upper arm or back of the hand and microvascular muscle flaps from the ear [29].

One of the known methods of multiple procedures methods of the columella and the tip of the nose reconstruction is the pedicled interpolar frontal lobe flap. Island-shaped arterial frontal lobe of supratrochlear blood vessels was used for reconstruction of larger nose defects or partial defects in the upper and middle part of the nose [3, 5, 6,13, 14, 22–27, 30–32]. Because there are different methods for reconstruction of the columella and the tip of the nose, we thought it reasonable to demonstrate experience in using the frontal island-shaped flap in resolving defect of the columella and the tip of the nose.

Case report

A patient, aged 45, was hospitalized because of skin tumor on the columella and the tip of the nose. The tumor by its morphological features resembled basal cell carcinoma (Figure 1). Radical excision was done after which there was a skin defect of the folowing dimensions - 3 × 2.5 cm, as well as exposed cartilage. In further surgical procedure reconstruction of the central island-shaped frontal lobe was performed. It was flapped with supratrochlear blood vessels on the left side. Secondary lobe defect was closed by direct suture. The operation was performed under general endotracheal anesthesia and lasted about 60 min. During postoperative period the flap was vital, and there was a shorter venous congestion of the flap and mild swelling of the nose that lasted for several days (Figure 2). Histopathological results confirmed that it was a basal cell carcinoma, which was radically excised at the periphery and depth. The patient was discharged from the hospital seven days after the operation, when the stitches were removed also. During the control examinations the last of which was performed one year after the surgery, there were no signs of recurrence, the results of the operation were satisfactory and with no need for additional corrections (Figures 3, 4).

Fig. 1 – Basal cell carcinoma of the columella and the tip of the nose

Fig. 2 – Island-shaped arterial forehead flap for reconstruction of the columella and the tip of the nose, 24 hours after the procedure

Fig. 3 – The result of reconstruction one month after the surgical procedure

Fig. 4 –The result of reconstruction one year after the surgical procedure

Disscusion

If we consider the number and type of the presented methods for columella reconstruction so far, the conclusion is that none of them is ideal.

Concerning the fact that skin is thicker in the lower half of the nose, free skin grafts are rarely used in that region because the aesthetic result is worse, and besides, that cannot be applied when cartilage is exposed without perichondrium. Isolated and fewer defects at the top of the nose can usually be covered with local skin flaps.

In columella defect, the use of local flap is limited because of its specific localization and morphology. Composite graft from the nasal alae, ear or mastoid region may be applied for partial columella defects and is commonly used with children with congenital retrusion of the tip of the nose [17]. In addition, this region is very ungrateful for the immobilization of grafts. Flaps from the nose vestibule or perialae region can be applied for minor defects of the columella, and, for larger defects, it is necessary that they are bilateral, and therefore the scars are more conspicuous. Furthermore, functional consequences may also occur, because the structure of the nasal aperture is disrupted. When using a flap from the upper or lower lip, a scar on the secondary defect is obvious. Tubule mucosal flap from the upper lip is a multiple method, and the tissue is of a different texture and color. Nasolabial flap [18–21] can be used as an interpolar which is multiple step method, or it can be used on the subcutaneous pedicle, and in this process the nasal wing is cut; pedicle is nevertheless often tense. It is usually suggested in the elderly with a relaxed face skin. Distant flaps from the neck, shoulders or hands are a multiple step method in which the forced position of a patient is required and a long-term cure [9]. In men, the flaps from the upper or lower lip, the nasolabial region and neck contain hair, and the aesthetic result is worse. Reconstructions of the columella with the frontal lobe or periauricle scalp flaps described so far are multiple step methods. Microvascular tissue transfer involves a long-term operation and cuts on the face in the area of recipient blood vessels. When a defect catches both the columella and the tip of the nose, some of these methods cannot be applied because of the size of the defect.

Island-shaped front flap is usually used in reconstruction of partial defects in the upper two-thirds of the nose or for total nose reconstruction [3, 5, 6, 13, 14, 22–27].

The method we applied involves accurate planning of the position of non-hairy part of the forehead. Preparation of the flap should be done carefully because it is necessary that the vascular pedicle is long enough. Preoperative supratrochlear artery Doppler-ultrasound is not necessary because its anatomy is constant, but vascular status of a patient needs to be examined. It is important that a vascular pedicle flap is not compressed after the transposition, and that is why it is necessary that subcutaneous space to the part of the defect is large enough. Partial resection of the *m. procerus* proposed by some authors, is not necessary, in our opinion.

The postoperative results of this method showed that the flap was vital in total and that it did not require additional corrective procedures. Benefits of this technique are in our view multiple: secure flap vascularization, satisfactory color, texture and thickness of the flap, reconstruction in one procedure, a surgery that is relatively simple and no long lasting, quick recovery of a patient and aesthetically acceptable scar on the secondary lobe defect.

Conclusion

Reconstruction of the nose must enable optimal functional, aesthetic and economic results. The columella and the tip of the nose are in reconstructive terms very complex regions, and therefore there are a number of proposed surgical methods. Most of the reported techniques are multiple steps or long-term surgical procedures. Bearing in mind the result of operational methods which are applied, we believe that the central island-shaped frontal lobe is suitable for reconstruction of the columella and/or the tip of the nose and that it meets all the requirements of optimal reconstruction. There is a safe flap vascularization, transfer of the tissue that is similar to the tissue from the defected region, simplicity and one-step procedure method and minimal morbidity in donor region.

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