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FOLDED PUZZLE FLAP AND ALLOGENEIC CARTILAGE GRAFT FOR RECONSTRUCTION OF TOTAL NASAL ALAR DEFECT

Introduction

The nasal alar is a paired anatomical subunit with a multilayer structure. The appearance of this subunit determines the cosmetic perception of the human face and its individuality to a significant extent [1, 2]. Reconstruction of full thickness alar defects is a challenge for surgeon. It is necessary not only to repair the skin integrity, but also to form the inner epithelial lining, to achieve symmetry of the nasal lower third and a stable shape of the remodeled subunit, and to ensure free air passage [2, 3]. There are two basic techniques: replacement of a full thickness auricular graft or forming the skin and lining with flaps adding a supportive graft implantation [1–3]. A number of flap designs has been worked out. Each method has its advantages and disadvantages. Generally, auricular graft is simpler procedure, but limited by blood supply in situ. Flap viability is more predictable, but there are techniques of complex design. Jigsaw puzzle flap (PF) was described in 2005 (Goldberg L.H. et al.) for repair of nasal alar skin defect [4]. This procedure can be performed as one-stage and is comparatively simple. We modified this method for reconstruction of through defect of alar [5]. This paper reports our experience in using of folded PF for reconstruction of full thickness nasal alar defect and discusses advantages and disadvantages of technique.

Material and methods

Sixteen patients underwent nasal alar reconstruction using folded PF after resection of skin carcinoma. All reconstructions were performed at the single hospital between 2017 and 2021 years. There were 6 men and 10 women aged 57 to 86 years old (median age = 67 years). All the defects occurred after basal cell or squamous cell skin carcinoma excision. The average defect size was 4.2 cm² ranged from 3.5 to 6.1 cm². Four participants had smoking history. General anesthesia was used in three operations and thirteen operations were performed under local anesthesia. Cosmetic and functional outcomes were evaluated in 6 months after reconstruction using 10-points visual analogue scale.

Surgical technique included repair of alar skin and lining and insertion of cartilage graft. PF was elevated from medial cheek according to size of missed external alar skin and lining. A round prominence like jigsaw puzzle was formed at the medial side of the flap (figure 2a). Skin was mobilized in the lateral direction up to 3–4 cm long. Skin triangles were excised to create puzzle-like shape of paddle. Flap was transferred to the defect by advancement. Lower part of prominent part was folded and fixed to inner lining. Thus, nostril margin was reestablished. A graft of the required shape and size was formed manually from a fresh frozen rib cartilage from a cadaver donor as a biological product. Cartilage graft appeared between the skin layers after folding the distal part of the flap. This procedure provides structural support of reestablished ala to prevent nasal valve collapse and scar caused deformity of subunit. It was inserted in wound pockets on each side of defect and fixed with sutures. Than external skin defect was covered with external part of PF. Defect wound closure were made easily due to laxity of separated

cheek skin. We used 1–2 through sutures to provide forming of natural nasal-cheek groove. Fastening of them were delayed for 4–5 days to prevent ischemia.

Results and discussion

All the defects were completely covered with PF. Reconstructions were completed in single stage in all cases. One partial necrosis of flap developed in patient with smoking history. There were no other complications in our material. Thus, total complication rate was 6,2 %. Average patient reported cosmetic outcome was rated 9,1 points (SD 0,9). Two patients evaluated results with less than 8 points. Unsatisfactory alar appearance was mentioned due to moderate deformity (1 case) and reduced size of alar (1 case). Cheek-alar groove was successfully reestablished in 14 patients. Changes of the donor site were minimal in all patients. Also, satisfied appearance of alar was achieved in 14 patients (87,5 %). Functional outcome of reconstruction was rated 9,4 (SD 2,5). Alar prolapse occurred in two patients resulting non-acceptable score.

Jigsaw puzzle advancement flap was described as a reconstruction technique for alar skin defect. Its main advantage is minimal change of donor site, comparatively simple procedure and single stage procedure. Main problem of PF is difficulty to create a natural nose-cheek groove. Rich blood supply provides capacity to use it as folded flap to reestablish lining of alar. Natural appearance of nose-cheek joint can be achieved using delayed suture technique. Presented approach is limited by the elasticity of cheek skin and defect size over than 2 cm in horizontal dimension.

Conclusion

Presented technique of folded PF can be used as a single stage procedure for reconstruction of full thickness nasal alar defects. Cartilage graft can be added to provide adequate support. Using of modified PF showed 87.5 % rate of optimal both cosmetic and functional scores.

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СЛУЧАЙ ДИРОФИЛЯРИОЗА В АБДОМИНАЛЬНОЙ ХИРУРГИИ

Введение

Дирофиляриоз — единственный в умеренном климате гельминтоз с трансмиссивным путем передачи. Возбудителем дирофиляриоза является нематода семейства Filariidae