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Autogenous auricular concha cartilage transplant in corrective rhinoplasty. Practical hints and critical remarks

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SUMMARY

Numerous materials have been suggested for correction of nasal defects, especially for the saddle nose. We present here our experience with the autogenous cartilage transplant from the auricular concha in our collective of 32 patients. The concha cartilage is used for saddle nose corrections and reconstruction of the alar cartilages. Auricular concha cartilage is an almost ideal transplant material for corrective rhinoplasty because:

1. *Harvesting of the material is a low-risk procedure that is not time-consuming and can be performed under local anaesthesia.*
2. *Concha cartilage is stable enough for support and elastic enough for contouring.*
3. *It can easily be shaped as desired.*
4. *Concha cartilage shows little tendency towards dislocation.*
5. *Resorption is negligible and thus plays no role in connection with these transplants.*
6. *Rejection or infection rarely occurs.*

INTRODUCTION

A great number of materials have been suggested for correction of saddle noses and other nasal cartilage defects. The value of autogenous auricular concha cartilage as nasal reconstructive material has already been pointed out by several authors, including Falces and Gorney (1972), Peck (1984), Tardy et al. (1985, 1989), Burget (1986) and Jovanovic and Berghaus (1989). This article describes our indications and technical procedure for this type of reconstructive surgery on the basis of experience gained from our collective of 32 patients with a follow-up period of 1-10 years. Practical hints and practical remarks are given.

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SURGICAL TECHNIQUE FOR HARVESTING CONCHA CARTILAGE

The back of the cartilage is exposed by a postauricular incision and the transplant is circumcised in the desired size. In case of uncertainty as to the resection borders, marking of the resection area can be done by inserting needles from ventrally into the concha cavity. The ventral skin is dissected, and the transplant is removed. The concha cartilage graft may also be excised through an anterior approach. The posterior approach, however, avoids wound scars on the ventral surface of the auricle. The resultant cartilage defect does not deform the auricle provided the anthelix remains intact. It is remarkable how much material can be removed from the cavity without causing structural loss detrimental to the support or appearance.

A seroma or hematoma can be prevented by fixing a spherical sponge in the concha cavity with mattress sutures. These sutures and the sponge are removed four days after surgery. 14 days later, no traces of the intervention are visible. Although it is presently unclear whether preserving one perichondral surface on the autograft exerts a favourable influence on long-term survival and contour maintenance of the graft, we transplant the perichondrium of the posterior (convex) surface together with the cartilage, while the perichondrium of the anterior (concave) side remains in the ear. Depending on the degree of deformity, a smaller or greater amount of soft tissue is also removed together with the perichondrium/cartilage graft. It seems that fixation of the graft occurs more rapidly if some soft tissue is allowed to remain attached to the auricular cartilage autograft during harvesting (Tardy et al., 1989).

COMPLICATIONS

In 32 chondrectomies of this kind, two complications occurred at the donor site. In one case, a seroma developed in the time before we used the mattress suture with the sponge. In the second case, a small perforating auricular defect of 3 mm formed under the sutured sponge. Thus we no longer leave the mattress suture in place for more than four days. We have used these transplants primarily to correct saddle noses and nasal tip deformities.

CORRECTION OF SADDLE NOSES

In order to be able to use the material for a saddle nose correction, we fashion it as required and usually superpose several fragments of cartilage held together by sutures in order to avoid malpositioning during placement at the recipient site (Figure 1a). Palpable steplike deformities or level discrepancies can be avoided by beveling the graft edges with a fine scalpel blade or by gentle morselling – for instance, with the teeth of a Brown-Adson forceps. Conservative "crushing" of the cartilage can produce a durable flat graft if desired (Kastenbauer, personal communication, 1989). Extensive "crushing", however, may cause concha

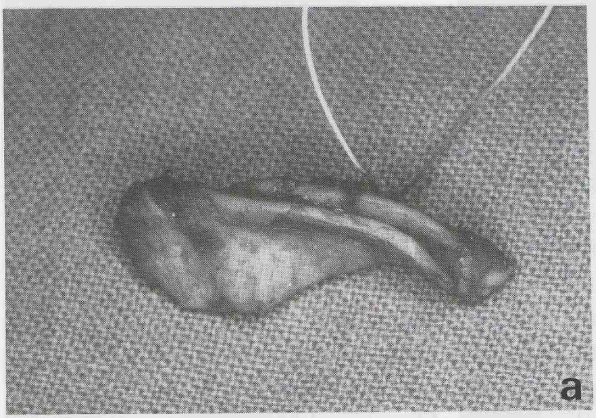


Figure 1a.
Concha cartilage. Two fragments held together by sutures.

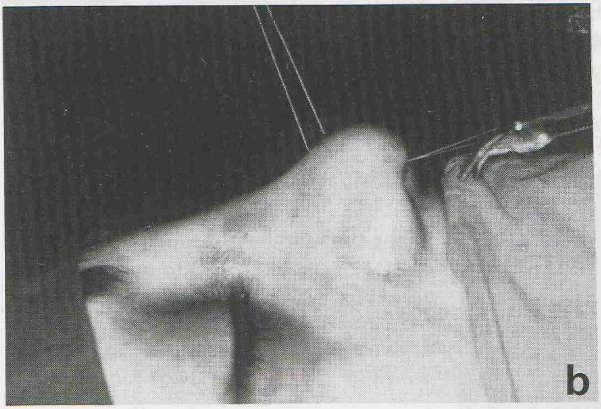


Figure 1b.
Introduction of transplant into recipient region via endonasal access for correction of saddle nose. Transplant is held in place by a guide suture.

cartilage to disintegrate much more readily than septal cartilage with a possible negative effect on long-term survival of the original graft shape. Therefore excessive "crushing", "dicing" or extreme morselling of concha cartilage grafts is avoided in favour of delicate shaving and sculpturing of larger pieces of cartilage to create thin cartilage pieces which remain flexible enough for contouring, yet rigid enough for support. Layers of temporalis fascia between the graft and the skin can further cushion a custom-contoured cartilage implant. The chip thus formed is then mostly introduced into the recipient region with the convex side up (perichondrium side) via the endonasal access for correction of the saddle. The transplant is held in place by a loosely fastened guide suture (Figure 1b). This procedure is indicated for minimal bony or cartilaginous saddle noses without serious functional problems. For more pronounced saddle noses accompanied by functional disturbances due to absence of the cartilaginous septum and "ballooning" of the upper lateral cartilage, we prefer a reconstruction of the

septum (e.g. in the sense of a so-called "exchange technique" according to Hellmich (1989)).

Case report

Figure 2a shows the patient M.T. prior to surgery. A loss of septal support due to nasal trauma and previous septum surgery according to Killian led to a cartilaginous saddle nose without a functional component. Though the saddle is not very pronounced, removal of the hump alone would not have been adequate. A reconstruction of the septum as causal therapy probably would have provided a more satisfactory correction of the saddle and the retracted columella, but the previous operation left no bony or cartilaginous septum material for reconstruction, and harvesting cartilage from the rib was not accepted by the patient. For this reason and because of the absence of functional disturbances, we corrected the saddle with a dorsal cavum concha-cartilage autograft. Figures 2b and 2c show the postoperative result one and two years later. No resorption of the autogenous concha cartilage transplant was evident. A biopsy of grafted cartilage two years postoperatively reveals vital hyaline cartilage of normal cell density embedded in connective scar tissue (Figure 2d). In our collective, resorption with these transplants was negligible during a follow-up period of 1–10 years. No rejection or infection occurred.

CORRECTION OF NASAL TIP DEFORMITIES

A further possibility for applying the concha cartilage transplant is reconstruction of the alar cartilages and the tip of the nose.

Case report

In this case (Figure 3a), treatment of a hemangioma on the tip of the nose in early childhood led to destruction of the dome of the alar cartilages and scarring of the outer skin. Reconstruction of the alar cartilages was performed with modelled concha cartilage. After crosshatching, concha strips were shaped like the alar cartilages and sutured together. The thus prepared transplant was sutured into the defect (Figure 3b).

The scarred skin was unfolded and partially used for reconstruction of the vestibulum. A columella strut provided additional support. Skin coverage of the defective area was achieved by use of an oblique forehead flap.

Figure 4 shows the final result 18 months postoperatively. The result is stable. No changes of the graft shape occurred.

CONCLUSION

Autogenous auricular concha cartilage is a nearly ideal transplant material for cartilaginous reconstructive surgery on the nose because:

Figure 2a. Preoperative lateral view of 33-year-old patient (M.T.) with history of nasal trauma and previous septum surgery according to Killian.

Figure 2b. Postoperative lateral view 12 months after transplantation of concha cartilage graft to the dorsum for correction of the saddle. The autograft was taken from the concha cartilage on the right side (patient M.T.).

Figure 2c.
Postoperative lateral view 24 months after transplantation of concha cartilage graft to the dorsum for correction of the saddle. No resorption of the autograft is evident. The cartilage graft maintained its shape, contour and resilience (patient M.T.).

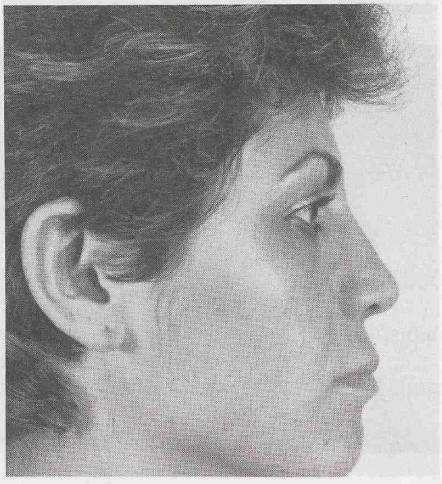
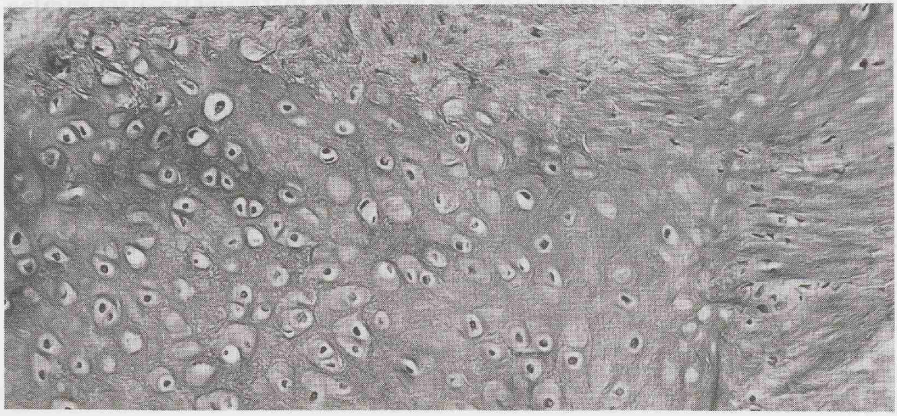


Figure 2d.
Histological picture of a biopsy of grafted concha cartilage two years postoperatively (patient M.T. of figures 1 and 2).
Vital hyaline cartilage of normal cell density embedded in connective scar tissue (H.E. x125).



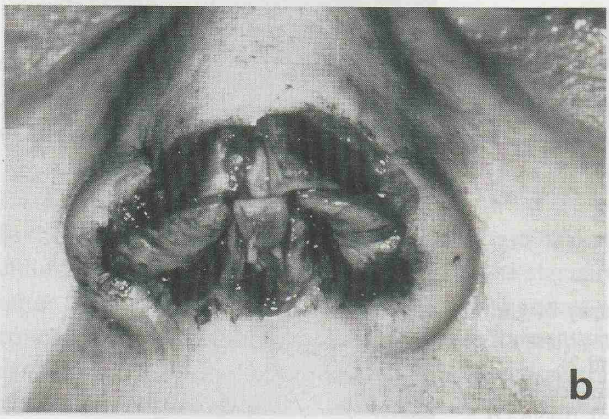


Figure 3a.
Preoperative frontal and lateral view of 60-year-old patient (C.K.) after treatment of a hemangioma on the tip of the nose in early childhood. Destruction of the dome of the alar cartilages and scarring of the outer skin.

Figure 3b.
Reconstruction of alar cartilages and nasal tip with concha cartilage.

1. Harvesting of the material is a low-risk procedure that is not time-consuming and can be performed under local anaesthesia.
2. Concha cartilage is sufficiently stable for support and elastic enough to preserve its shape.
3. The material can easily be shaped as desired.
4. Due to its structure and high tissue biocompatibility, concha cartilage shows little tendency towards dislocation.
5. Our experience has shown that resorption plays no role with these transplants.

Figure 4. Postoperative frontal and lateral view 18 months after reconstruction with concha cartilage (patient C.K. of Figure 3a).

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