

Comparison of different autografts for aural cartilage in aesthetic rhinoplasty: is the tragal cartilage graft a viable alternative?☆

Max J. Zinser^{a,*}, Mathias Siessegger^b, Oliver Thamm^c, Panangiotis Theodorou^c,
Mark Maegele^d, Lutz Ritter^a, Matthias Kreppel^a, Martin H. Sailer^e, Joachim E. Zöller^a,
Robert A. Mischkowski^a

^a Department of Oral and Craniomaxillofacial Surgery, University Cologne, Germany

^b Clinic for Facial Surgery, Cologne, Germany

^c Department of Plastic Surgery, Clinic Cologne-Merheim, Germany

^d Department of Trauma and Orthopaedics, Clinic Cologne-Merheim, Germany

^e Department of Biomedicine, University of Basel, Switzerland

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Abstract

Auricular cartilage is an important source of grafts for various reconstructive procedures such as aesthetic rhinoplasty. The purpose of this investigation was to compare tragal cartilage with auricular cartilage harvested from the concha and scapha, and describe its clinical viability, indications, and morbidity in rhinoplasty. A total of 150 augmentation rhinoplasties with a total of 170 grafts were included. The donor sites were tragus ($n = 136$), concha ($n = 26$), and scapha ($n = 8$). The time needed to harvest the grafts, the donor site morbidity, and the indications for operation were recorded. The anthropometric changes to 4 auricular variables after the cartilage had been harvested were analysed and compared with those on the opposite side in 48 patients using Student's paired *t*-test. Intraobserver reliability was assessed using Pearson's intraclass correlation. The mean (SD) harvesting time was 27 (8) min for the concha, 4.5 (1.4) min for the tragus, and 5.7 (1.6) min for the scapha. The largest graft was taken from the concha (28 × 19 mm), followed by the tragus (20 × 12 mm), and the scapha (18 × 6 mm). The grafts were placed at the following sites: tip grafts ($n = 123$), columella struts ($n = 80$), shield ($n = 20$), rim ($n = 17$), and dorsal onlay ($n = 15$). Harvesting tragal cartilage is safe, simple, fast, and has a low morbidity, but it can affect the patient's ability to wear earphones. Tragal cartilage is a good alternative for nasal reconstruction if a graft of no longer than 20 mm is required.

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Introduction

Since the fundamental work of Ortiz-Monasterio et al.,¹ Tardy et al.,² Peck,³ and Sheen,⁴ autogenous cartilage has been the graft material of choice in nasal surgery in terms of safety, durability, and versatility. Most surgeons prefer the septum as their first choice of donor site, followed by the conchal cartilage.^{5,6} Only a few surgeons promote the use of allografts as their first choice in augmentation rhinoplasties.^{7,8} Cartilaginous grafts can be obtained from the

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* Corresponding author at: Eugen Langen Strasse 12, 50968 Köln, Germany. Tel.: +49 171 8349256.

E-mail address: drmaxzinsler@yahoo.de (M.J. Zinser).

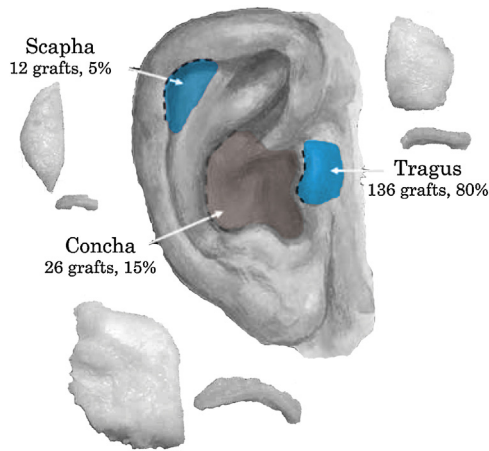


Fig. 1. Distribution of donor sites and properties of auricular cartilage grafts.

nose, the septum, the rib, and the external auricle.² The external ear provides a viable alternative in graft-depleted patients when the septal cartilage had already been used, ideally for secondary and tertiary rhinoplasties.^{9–13} Most surgeons still prefer conchal grafts for augmentation-reconstruction rhinoplasties, but Grobbelaar et al.¹⁴ reported a morbidity of 2.2%, mainly postoperative deformities of the ear, haematomas, and hypertrophic scarring. The mean time needed to harvest the conchal cartilage ranges between 25 and 30 min.^{2,11,13}

Cochran and DeFatta⁹ and Kotzur and Gubitsch¹⁰ have since introduced the tragal cartilage as a viable alternative in graft-depleted patients. The purpose of the present comprehensive study was to compare tragal cartilage with conchal and scaphal cartilage for augmentation rhinoplasty. We have assessed the different clinical indications, viability, and feasibility – including the time taken to harvest the graft, donor site morbidity, and anthropometric changes of the ear – for each graft.

Materials and methods

This retrospective study comprised 150 augmentation rhinoplasties done between February 2001 and April 2011 (Table 1); 140 were done for aesthetic reasons, and 100 were primary, 35 secondary, and 5 tertiary. Ten patients had had a cleft lip repair and required reconstruction of the cleft nose.

Only patients who had auricular cartilage grafts (tragus, concha, or scapha) were included (Fig. 1, Table 1). Patients in whom septal cartilage was used were excluded. A total of 170 cartilage grafts (136 tragal (80%), 26 conchal (15%), and 8 scaphal grafts (5%)) were harvested (Fig. 1). All operations were done by 3 experienced surgeons. In 10 patients, tragal cartilage was harvested from both sides. There were 102 women (68%), mean (SD) age 25 (5) years, and 48 men (32%), mean (SD) age 26 (5) years.

The grafts were used to: reconstruct the cartilaginous structure of cleft noses, cover bony and cartilaginous defects, smooth out irregularities, stabilise (as batten grafts),



Fig. 2. Technique for harvesting tragal cartilage. The incision line must be marked at the posterior border of the edge of the tragus.

contour (as shield grafts), refine the nasal tip, avoid “open roof” syndrome, and prevent formation of scars between the skin and the bone, particularly if the skin was thin. All subjects signed consent forms according to the Declaration of Helsinki preoperatively.

Assessment of donor site morbidity and anthropometric analysis

Donor site morbidity and harvesting time of each graft were recorded for each patient. This included documentation of early complaints, including haematoma and perioperative pain that resolved within 3 weeks, and irreversible complaints including scarring, sensory disturbances, and pain at the donor sites.

In 48 patients the anthropometric changes after cartilage had been harvested were compared with those from the opposite unaffected ear according to the protocol described by Weerda.¹⁵ The width, length of the auricles, the protrusion angle of the mastoid–auricular plane, and the distance between the tragus and the lateral canthus, were measured and compared with those of the unaffected side. The anthropometric measurements were made at least 6 months postoperatively when the swelling had completely resolved.

Grafting techniques

The scaphal and conchal cartilage grafts were harvested according to the technique described by Nolst Trenité.¹⁶

The minimally invasive approach to the harvesting of tragal cartilage is shown in Fig. 2.¹⁰ From an incision in the tragal rim at the inner border, we dissect subperichondrally to the anterior and posterior of the tragal cartilage. Hydrodissection with local anaesthetic solution containing adrenaline facilitates the preparation. The facial nerve is located about 10–12 mm anterior to the lower end of the cartilage. Nearly the whole tragus can be removed, leaving only a small rim 2 mm wide at the site of the incision for structural support.

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