Numerous cartilage grafts with varying shapes and sizes have been described for placement during rhinoplasty. Donor sites include the nasal septum, the conchal bowl, and the costal chondral cartilage. Conchal cartilage is routinely harvested, especially during secondary rhinoplasty, when the nasal septum is not available. Despite wide utilization, the conchal bowl has been minimally described. The conchal bowl is composed of two components, the superior cymba and the inferior cavum, which are divided by the conchal extension of the helical root. The conchal bowl is bordered anteriorly by the helical root and posteriorly by the conchal extension of the helical root.
and external auditory meatus. Posteriorly, the bowl is continuous, with side walls that are preserved during harvest to maintain structural stability of the ear. Except for the above anatomic descriptions, conchal bowl parameters have not been presented. In this report, we identify differences in the conchal bowl cartilage parameters that could aid in the planning and harvesting of conchal grafts during augmentation rhinoplasty.

**METHODS**

Fourteen cadaver ears (eight females and six males) ranging between 59 and 77 years of age were dissected and the conchal bowls were isolated. Subsequently, the lateral surface soft tissue was removed in order to expose a single cartilage surface in preparation for cartilage mapping. The reference point or origin (0, 0) was marked at the junction of the helical root and the conchal extension of the helical root (Figure 1). A cartilage grid was then mapped out at 3-mm interval divisions with a horizontal limb axis parallel to the helical root extension and a vertical limb axis perpendicular to the latter.

maximum conchal bowl width ranged from 1.9 to 2.9 cm and was widest on average over the cymba (2.4 ± 0.3 cm) compared to the cavum (1.8 ± 0.2 cm, \( P < .001 \)).
Maximum conchal bowl height ranged from 1.7 to 3.1 cm and was greatest on average over the region posterior to the junction of the helical root and conchal bowl (2.4 ± 0.5 cm) compared to the region anterior to the junction of the helical root and conchal bowl (1.7 ± 0.5 cm, $P < .001$). Conchal bowl thickness ranged from 1.9 to 4.4 mm and was observed thickest over both the conchal extension of the helical root (3.5 ± 0.4 mm; see Figure 2), as well as over a distinct region in the inferior-anterior aspect of the cavum (3.7 ± 0.9 mm), followed by moderate thickness over the conchal cavum (2.6 ± 0.5 mm) and minimal thickness over the conchal cymba (2.3 ± 0.4 mm; $P < .001$). No difference in thickness was observed between the conchal extension of the helical root (3.5 ± 0.4 mm) and the distinct region in the inferior-anterior aspect of the cavum (3.7 ± 0.9 mm; $P > .05$).

Figure 4. Conchal bowl thickness ranged from 1.9 to 4.4 mm and was observed at its thickest over both the conchal extension of the helical root (3.5 ± 0.4 mm; see Figure 2), as well as over a distinct region in the inferior-anterior aspect of the cavum (3.7 ± 0.9 mm), followed by moderate thickness over the conchal cavum (2.6 ± 0.5 mm) and minimal thickness over the conchal cymba (2.3 ± 0.4 mm; $P < .001$). No difference in thickness was observed between the conchal extension of the helical root (3.5 ± 0.4 mm) and the distinct region in the inferior-anterior aspect of the cavum (3.7 ± 0.9 mm; $P > .05$).

Figure 5. (A) Lateral and (B) medial (postauricular) conchal bowl surfaces. The two thickest areas in the conchal bowl can be appreciated and include the helical root extension of the concha prominent over the lateral surface and a distinct region in the inferior-anterior aspect of the cavum over the medial (postauricular) surface, termed the postauricular crus.

postauricular crus (Figure 5). Finally, naturally-occurring cartilaginous divisions were appreciated on histologic specimens located at the junction of the cavum and external auditory meatus (Figure 6) and at the junction of the helical root and conchal extension of the helical root (Figure 2).
DISCUSSION

This study has defined conchal cartilage characteristics (width, height, and thickness) and identified differences in various bowl regions. With this knowledge, clinicians should be able to preoperatively select the suitable site for conchal graft harvesting. For example, it is noteworthy that the cymba is the widest yet thinnest cartilage region. This information may lead to the harvesting of a thin dorsal graft, which can be more readily camouflaged and will span both the upper and middle vaults if so desired. In addition, this area would offer an excellent choice for a tip graft or alar rim graft since these grafts often need to be supple in order to avoid unnatural prominences. It is notable that the cymba is routinely split from the cavum to be worked with individually. Some surgeons further split the cymba down the middle and apply a horizontal mattress suture at each end of the two halves, in order to create more manageable units of cartilage graft that are stronger and straighter.

In contrast to the cymba, the extension of the helical root may be utilized to harvest a thicker graft such as a spreader, subdomal, or columellar strut graft. Finally, there may be occasion to choose a graft that requires variable surface thickness over its span. For example, it might be desirous to have a shield graft that is thinner over the infratip lobule yet more prominent underlying the tip defining points in patients with thick nasal tip skin. In the latter patient, a graft from the cavum that includes the firmer and thicker inferior-anterior region of the cavum would be an ideal choice.

Knowledge of conchal bowl span and natural divisions should be especially helpful during secondary rhinoplasty, where the suitable portion of the cartilaginous septum has been removed. In this situation, it is imperative to maximize harvested graft yield, which may be shortchanged if one does not harvest the entire conchal bowl. Limiting harvest material will only decrease graft resources and result in palpable ear irregularities. Finally, anterior dissection may be performed without injury to the external auditory meatus or helical root if one utilizes knowledge of naturally occurring division lines at the helical root junction as well as the external auditory meatus junction. The posterior perichondrium may be preserved on the cartilage if one wishes to utilize this material for camouflaging of grafts during rhinoplasty. Great care must be taken to avoid injury to the anterior skin. Following harvest, the graft should be maintained in a moist environment. Meticulous hemostasis is achieved to prevent postoperative hematoma formation, the wound is irrigated with antibiotic solution, and the skin incision is repaired. We recommend a through-and-through stitch prior to closure of the postauricular skin through the anterior skin, the mastoid fascia, and then back through the anterior skin, in order to provide for a secure bolster dressing. This suture is tied over a moistened dental roll compressed into the conchal bowl void. Postoperatively, ointment is maintained on the incision line until postoperative day seven, when the bolster dressing is removed and ointment application discontinued.

CONCLUSIONS

Knowledge of facial anatomy is critical to a successful surgical outcome, especially during rhinoplasty. Our results, examination, and outline of conchal bowl parameters from cadaver cartilage will aid the surgeon in effectively obtaining cartilage grafts during rhinoplasty.

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REFERENCES