Preoperative clinical and photographic assessment is an essential step for any rhinoplasty operation and an appropriate operative plan addressing each problem should be made prior to surgery. These steps are particularly important in nasal tip rhinoplasty because of the complexity of the procedure. Specifically, the position and configuration of the lower lateral cartilage (LLC) is one of the critical nasal anatomic characteristics. Because changes in the LLC configuration can have secondary effects on nasal length, projection (total and intrinsic), and rotation, all three of these characteristics should be routinely assessed in preoperative consultations using preoperative photographs.

Constantian argued for the importance of preoperative identification of the lateral crus long axis orientation, noting the effect it has on the functional and aesthetic aspects of rhinoplasty; a cephalically rotated lateral crus (ie, lateral crus axis toward the medial canthus) is more likely to be associated with valvular incompetence than an orthotopic lateral crus (ie, lateral crus axis toward the lateral canthus). However, in his discussion of the Constantian paper, Daniel does not rely on the surface anatomy to diagnose an alar malposition. He considers the lateral crus cephalically rotated (malpositioned) if the mid nostril distance between the vestibular alar rim and the caudal edge of the lateral crus exceeds 6 mm. Daniel also questions the accuracy of the preoperative alar shape diagnosis: “it—diagnosing alar malposition—is a subjective judgment call based on inspection of the perceived surface expression of the alar cartilages through the external nasal skin.”

The goal of this study is to determine the accuracy of the preoperative assessment of the LLC shape and configuration.

Keywords
predissection, lower lateral cartilages, rhinoplasty, nasal tip surgery

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The current literature on preoperative assessment emphasizes dimensional analysis; a literature search through Medline (search words: lower lateral cartilage, anatomy, nasal tip, rhinoplasty, preoperative assessment; search conducted in January 2009) failed to reveal any previous studies on the accuracy of preoperative assessment of the shape of the nasal tip cartilages.

METHODS

The study was performed on cadavers in the anatomy department of the University of Newcastle. By way of observation and palpation, the configuration of the lateral, middle, and medial crura was assessed and documented on 42 LLC (21 cadavers) prior to dissection. The assessment was the result of the collective opinion of the authors; the two senior authors (SC, MR) have a combined experience of 16 years in rhinoplastic surgery. The tip defining points, the point of divergence, the footplate and columellar segments of the medial crus, the domal and lobular segments of the middle crus, and the lateral crus were identified on each specimen. The shape and curvature—concavity or convexity—of different segments of LLC were documented by drawing the shape of each segment as it was perceived before the dissection. The drawings were then compared with the shape of each segment as it was observed after exposure of the LLC through an open-approach rhinoplasty dissection. Predissection assessment of one segment was considered accurate only if the drawing matched the postdissection configuration completely. Full exposure of all segments of LLC was required for the purpose of the analysis, so the study was conducted on cadavers with an open approach, as full exposure of all segments of LLC was not indicated in every case of rhinoplasty performed on live patients.

RESULTS

The predissection assessment of the LLC crura configuration and shape matched the postdissection assessment in all 42 medial crura (100% accuracy), 32 of 42 middle crura (76% accuracy), and 12 of 42 lateral crura (29%) (Figures 1 and 2).

DISCUSSION

Our understanding of the nasal tip’s dynamics and its deformities has evolved since the “tripod” concept was introduced almost four decades ago. A vast number of techniques have been described to address a wide range of nasal tip deformities. Most of these are performed through an open approach, which provides better exposure in a limited space and allows better diagnosis of the nasal tip deformities.

Deformities of the upper two-thirds of the nasal skeleton can be assessed on photographs and clinical examination prior to operation, allowing a surgical plan to be put in place. However, the same cannot be said for the lower third of the nose. We have shown in this study that predissection assessment of the lateral crus configuration is not accurate and that the definitive surgical plan cannot be finalized until the LLC has been exposed by dissection.

Open-approach dissection was utilized to expose the LLC because the authors believe it provides the best means of access to evaluate and address nasal tip deformities. Since the introduction and popularization of open rhinoplasty in the 1970s, the number of open rhinoplasty approaches designed mainly to address difficult tip deformities and achieve better symmetry has increased. Although some surgeons have been able to address nasal tip deformities through a closed approach, including few highly skilled surgeons who have achieved exceptional results using this method, the general trend has been to use open rhinoplasty to correct the major nasal tip deformities.

Our findings have an important clinical implication: one should be aware of potential inaccuracies in preoperative
assessments of alar cartilage shape, as these might have consequences in surgical planning. A definitive plan of action for correction of the nasal tip cannot be set in stone before the LLC has been exposed. As no single technique suffices to correct the nasal tip deformities, the surgeon needs to master a wide variety of techniques in order to be able to correct any nasal tip deformity encountered after LLC exposure.

There are two potential limitations to our study. First, the assessment of the cartilage configuration in cadavers differs from that of humans because of the rigidity of the specimen and the method of preservation. It is also possible that configuration of the LLC would be altered from pre-dissection to postdissection because of detachment of the soft tissue during that time. Our study cannot determine with certainty whether the discrepancy between the pre- and postdissection configuration we observed was caused by a real change in configuration secondary to the soft tissue detachment or by the operator’s inability to assess the configuration correctly prior to LLC exposure. In any case, the message remains the same: predissection assessment of the shape of the lateral crus is not accurate.

CONCLUSIONS

The configuration of the lateral crus of LLC cannot be assessed accurately prior to exposure of the cartilage in most cases. A rhinoplastic surgeon who embarks on the nasal tip surgery should be prepared to address any tip deformity discovered intraoperatively, as the preoperative clinical and photographic assessments cannot reliably demonstrate the type of LLC deformity.

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