Discussion: Effects of Cutting Planes on Costal Cartilage Warping

David Mattos, MD, MBA
Richard G. Reish, MD
New York, NY

We would like to congratulate the authors on an outstanding article on graft donor choice,[1] which is extremely relevant in revision rhinoplasty. One of the main tenets in revision rhinoplasty is that the amount of available donor cartilage should not dictate how the operation is performed. If the surgeon has preoperatively planned on extended spreader grafts and then alters that plan midoperation because there is not enough structural graft material available, this decision will likely lead to surgical failure necessitating revision surgery. The authors detailed the warping principles of autologous rib grafts, which is already known to most surgeons. Although the authors present well-articulated findings, this information is likely not novel to most experienced surgeons who routinely harvest rib and will not likely alter practice habits.[2,3]

Warping in fresh frozen costal cartilage (FFCC) may be a more germane topic for rhinoplasty surgeons. FFCC is an increasingly popular type of graft used in revision rhinoplasty. Some surgeons believe that FFCC should not be used in revision because of warping, infection, and resorption concerns. In the article by Rohrich et al.[4] and the article by our own group,[5] FFCC was demonstrated to have low rates of complications. However, warping is certainly a concern with autologous rib cartilage; depending on the way it is harvested, it only allows use of central grafts, leaving a lot of rib cartilage unusable, and sometimes requires additional rib cartilage to be removed during a case. In contrast, there are many ways potential warping issues in FFCC can be overcome. The first is cartilage selection. Cadaveric cartilage from older donors is typically stiffer and warps less than cartilage from younger donors.[4,6] The surgeon can select the desired characteristics before opening the package. Older cartilage appears more yellow and heterogeneous, whereas younger cartilage appears whiter and more homogenous. Next comes thawing. FFCC should never be immediately placed in the nose without fully thawing it for at least 1 hour before use. The cartilage always appears straight when initially removed from the frozen packaging and if immediately placed in the nose, a seemingly straight piece of cartilage will later warp inside the patient. This will result in a suboptimal long-term outcome. Therefore, the surgeon must allow adequate time for appropriate warping to occur before placing the cartilage in the nose and then cut the pieces in a way to obtain straight pieces. (**See Video [online]**, which shows the evolution of a piece of FFCC as it thaws and warps in the operating room. The straight segments can be selected once the FFCC is fully thawed for 1 hour before placement into the body.) It should be noted that unlike septal cartilage, which responds extremely well to scoring to help straighten it, FFCC does not respond to scoring, so scoring cannot be used to help straighten a warped piece of donor cartilage. The ability to tolerate some degree of warping depends on the type of graft being used. Paired bilateral spreader grafts can have a greater tolerance for some degree of warping as the warped pieces can be placed in symmetric opposition.[3] Alar contour grafts are designed to be pliable and lack the structural rigidity of other grafts, and therefore, having a straight piece is not as crucial. In contrast, a columellar strut graft or septal extension graft requires a much straighter piece of cartilage, and therefore, there is no tolerance for warping in these grafts.

From the Department of Plastic Surgery, Manhattan Eye, Ear and Throat Hospital; and New York Plastic Surgical Group.
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Any surgeon planning to use FFCC should have a generator–backed-up, −40°F freezer to store multiple pieces. This storage capacity always maintains pieces in stock, protects against delays in availability, and ensures one has options to pick from for each indication. Surgeons receiving a single donor cartilage for each case may receive an imperfect piece, cornering them to decide between rescheduling the case, using a suboptimal piece of cadaveric cartilage, or using a less ideal source of cartilage, such as auricular cartilage, which does not have the same strength needed for structural supportive grafts. There is a learning curve for using donor cartilage, but once the surgeon becomes well versed, FFCC can become a very useful tool in revision rhinoplasty. Although a moderate degree of trepidation is warranted for some surgeons in using FFCC instead of autologous rib, some of this is attributable to poor experiences from not using it appropriately.

In the end, long-term outcomes will justify surgeon preferences and should be the final determining factor in assessing the quality of techniques. We must be open to innovation when it can be proven safe in practice and then brought to light in our peer-reviewed literature. In a busy rhinoplasty practice, high-density long-term patient follow-up will ultimately teach us what works well and what does not. We would venture to postulate that most busy rhinoplasty surgeons likely adapt 1 or more major or minor innovative changes in the way they perform this surgery every year. These changes can be significant or extremely small sometimes, but after all, rhinoplasty is a technical parlay of millimeters, not centimeters.

Richard G. Reish, MD
New York Plastic Surgical Group
1040 Park Avenue, Suite 1BC
New York, NY 10028
rreish@lipsg.com
@dr.richard.reish

DISCLOSURE

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PHOTOGRAPHIC CONSENT

Written informed consent was given by participants for use of their images in the video.

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