The Role of Diced Cartilage Grafts in Rhinoplasty

For the author, diced cartilage grafts have revolutionized dorsal grafts in rhinoplasty, replacing layered septal grafts, stacked conchal grafts, and carved costal cartilage grafts. He asserts that diced cartilage wrapped in fascia is simpler to use, quicker, and aesthetically superior to solid cartilage grafts, without risks of warping, malalignment and K-wire extrusion. (Aesthetic Surg J 2006;26:209-213.)

I would like to preface my discussion of the role of diced cartilage grafts in rhinoplasty with 3 important points. First, the fundamental technique is not new. It was extremely popular in Europe between the world wars with numerous surgeons developing cartilage dicers and chondrojet injectors.1,2 Second, many surgeons, including myself, have used the technique for more than 25 years and are pleased with its long-term viability.3,4 One of the most impressive uses of diced cartilage is in cranioplasty, a use that demonstrates that the individual pieces coalesce into a semi-rigid graft with time.5 Third, the term diced cartilage graft may encompass different types of cartilage, methods of preparation, and methods of containment. This variability leads to confusion when comparing clinical indications, techniques, and results. Following is a clarification of my materials and methods.

Cartilage. I use only autogenous cartilage derived from excised material, septum, or distant grafts (concha, rib). Because of their long-term absorption, I see virtually no justification for using cadaver cartilage grafts.6 Under exceptional circumstances related to age, ethnicity, or systemic risks, I would consider allografts. However, that would only be in about 1% of patients. My goal is to have the graft survive completely, similar to a columellar strut or spreader graft. I cut the cartilage into 0.5- to 1-mm cubes, using #11 blades, and then deposit it into a small syringe for easy placement.

Containment. The diced cartilage may be placed directly into a tight pocket for contour, layered on either side of a rigid dorsal graft for blending, or placed in peripyriform pockets to advance the midface. When used as dorsal or radix grafts, I prefer to wrap the diced cartilage in autogenous fascia, as this material confines the graft, smoothes any irregularities, and may act as a neoperichondrium. I tried Erol’s “Turkish delight” method and found that absorption with clinical failure occurred in all patients. I attribute this to a foreign body reaction to the Surgicel (Johnson & Johnson, New Brunswick, NJ).7

Surgical Technique

I prepare the diced cartilage grafts with a technique that is straightforward and easy to replicate (Figure 1). All graft material is placed in dilute Bacitracin (Pharmacia & Upjohn, Kalamazoo, MI) antibiotic solution. It is then diced (usually by the circulating nurse) into 0.5- to 1.0-mm cubes with #11 blades. The cartilage is then repeatedly washed with antibiotic solution; no blood is added. Unless the area to be augmented is relatively small, the diced cartilage is packed into a 1-cc disposable tuberculin syringe. Prior to cutting the hub off with a #10 blade, the cartilage is “compacted” using the plunger. If a diced cartilage-only graft is planned, such as is used for blending in a rigid dorsal rib graft, then the diced cartilage is injected straight from the syringe. When a fascial-wrapped graft is planned, such as in a full-length dorsal graft, then the fascia is sutured with 4-0 plain catgut around the hubless syringe. The fascial-covered syringe is inserted into the dorsal pocket, and the graft is injected until the desired appearance is achieved. When a fascial-wrapped graft is planned, such as in a full-length dorsal graft, then the fascia is sutured with 4-0 plain catgut around the hubless syringe. The fascial-covered syringe is inserted into the dorsal pocket, and the graft is injected until the desired appearance is achieved. The syringe is removed, the skin is redraped, the contour is checked, and any excess graft is massaged out of the fascial sleeve, which is then sutured closed.

Results

Based on a prospective study of more than 150 patients during the last 3 years, there has been no evidence of absorption and (obviously) no warping. To date,
problems with the diced cartilage graft have been technical rather than inherent in the graft material. A correlate in traditional rhinoplasty would be visibility of the cephalic end of a spreader graft—it is not the fault of the graft material.

My problems with diced cartilage grafts have been relatively minor and easily corrected. One problem, the visibility of radix grafts, especially in patients with very active eyebrows (elevation >15 mm), is easily corrected under local anesthesia, either by reduction with a pituitary rongeur or replacement with fascia alone. For dorsal grafts, the occasional edge show occurs cephalically; caudally, there may be inadequate grafting of the supratip region. The edge show, probably caused by poor technique and the very thin skin in the rhinion area, is easily corrected in the office under local anesthesia using a pituitary rongeur.

Occasionally, a minor depression develops in the supratip area because the surgeon, in pursuing an immediate supratip break, has initially undercorrected. Over time, I have learned to keep the graft truly “full length,” as opposed to shortening it to get tip set off. So far, the minor depression has been something I notice, but the patients don’t complain about. If they did complain, I would correct it with a small fascia graft, although other surgeons might prefer Alloderm (LifeCell Corporation Branchburg, NJ). These complications are in sharp contrast to serious problems inherent in more rigid dorsal grafts, which can include warping, malalignment, and K-wire extrusion.

Current Indications/Modifications

During the past 3 years, indications for using diced cartilage have expanded to include the entire range of rhinoplasty patients, ages 14 to 68, without restriction for age, ethnicity, etiology, or number of prior surgeries.1-9

Dorsum. Diced cartilage has dramatically revolutionized dorsal grafts in rhinoplasty surgery. In my hands, it is a much less stressful technique, quicker (15 minutes vs 1-2 hours), more flexible regarding height (2-8 mm), and has fewer postoperative problems and a superior aesthetic result in most patients (Figure 2). It has favorably changed what can be achieved in Asian rhinoplasty, using autogenous material while solving the difficult
Figure 2. A, C, Preoperative view of a 43-year-old woman who was seeking a “westernized” nose. B, D, Postoperative views 2 years after a full-length, diced cartilage in fascia graft to the dorsum.
Second Thoughts

challenge of half-length radix/dorsal grafts. In secondary cases, diced cartilage grafts have survived despite numerous prior operations, and in patients in whom cadaver cartilage has failed. Theoretically, I would still perform a rigid osseocartilaginous graft in severe nasal collapse, as would occur in a type V saddle nose.

Radix. My initial interest in Turkish delight grafts was to obviate the need to harvest fascia for radix grafts. Thus, the failure of Turkish delight grafts led me to use fascial-wrapped grafts in the radix. Based on my prior overcorrection with the Turkish delight grafts, I overcorrected my initial 6 fascial-wrapped grafts and had to reduce them. Subsequently, I began to see some of the fascial-wrapped grafts in the radix, especially in patients with very active eyebrow excursion, and have reduced 2 cases. Thus, I tend to use fascia alone for minor and moderate-size radix grafts. I reserve fascial-wrapped grafts for major radix defects and half-length...
radix/dorsal grafts (Figures 2 and 3). Visibility has not been a problem in these patients, probably due to thicker skin (Figure 2) and more caudal placement (Figure 3). 

References


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