

## 45. Cartilage Grafts

### THE FINISHING TOUCH OF CARTILAGE

BECAUSE of the original super flatness of the nasal tip in the bilateral cleft deformity with the absence of septal development, the open angle of the alar cartilages and their actual separation from each other, even when the alar cartilages are brought together, the tip is released and the columella is lengthened, there tends to be a lack of definition in tip projection. Then, too, the columella may not present a smooth convex column from lip to tip. Both of these discrepancies are best alleviated by a straight, slim, stiff strut of autogenous cartilage.

In 1932 Gillies and Kilner, noting the lack of septal development in the bilateral cleft lip nose, advocated a supporting graft of autogenous costal cartilage. Others, before and after that time, followed a similar plan.

As plastic surgery became more sophisticated, the soundness of autogenous grafting was forgotten, and more expedient methods were developed. Barrett Brown became infatuated with fresh and preserved homologous cartilage in 1940. In 1948, with DeMere, he wrote an instructive and persuasive paper on the preservation of cadaver costal cartilage in aqueous Merthiolate. The dynamic Brown was at the height of his power, and most surgeons followed him like sheep into a pen. Hundreds upon hundreds of preserved L and other-shaped costal cartilage grafts were inserted. Lamont, Straith and others published reports of their use of preserved human rib cartilage in the bilateral cleft lip nose. As utilizing human cadaver cartilage was unlawful in England, Gillies became one of several to simplify the process by using preserved ox cartilage, and, not to be outdone, McIndoe began using preserved whale cartilage. Having climbed on the preserved cartilage bandwagon myself and after many hours in autopsy



rooms, I went off to Korea with the marines carrying a bottle of peeled ribs jiggling about in 1:1,000 aqueous Merthiolate. As with many others, it took me about 10 years to realize that this preserved cartilage was gradually absorbed in too great a percentage of cases. It was also noted that smaller, thinner grafts seemed to be easier prey to the phagocytes, being absorbed quicker and more completely. As a columella strut must be slim to be aesthetic, its ultimate chances were nil.

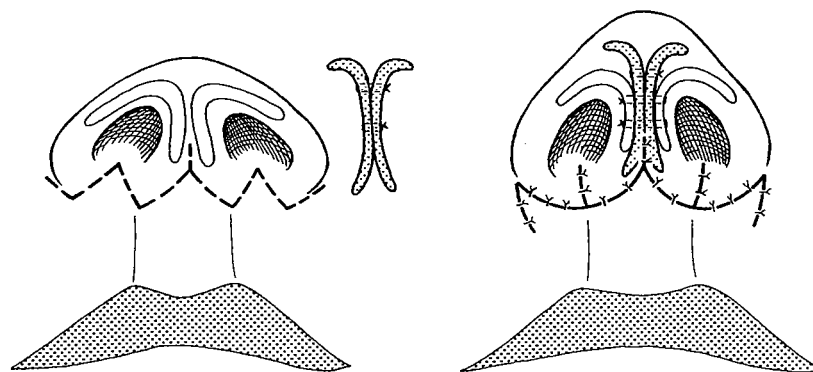
In 1961 Dingman and Grabb advocated preservation of cadaver cartilage by radiation, and to this day Dingman reports little problem with absorption.

Whether suspicious of or disenchanted with the preserved cartilage trend he had started, and always searching for something better, Barrett Brown reported an interest in silicone with Fryer, Randall and Lu in 1953 and again with Fryer and Ohlwiler in 1960. Of course, the general value of silicone is now well established, but its use in the columella can be dangerous, as I wrote in 1966:

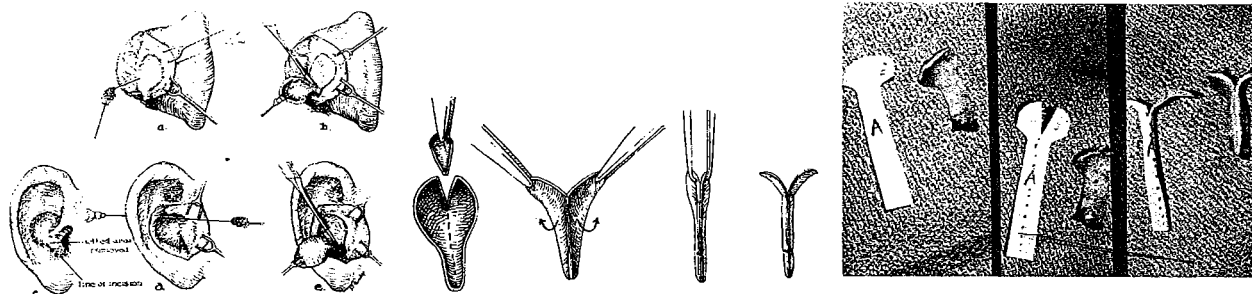
And foreign bodies are hazardous when implanted as superficially as the columella or when called upon to produce enough thrust to lift the tip.

#### RETREAT TO THE EAR

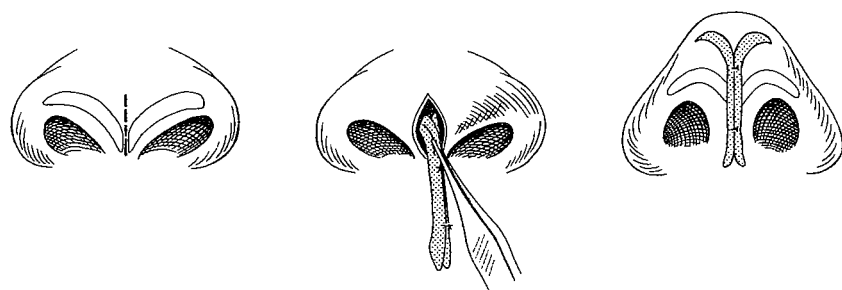
Some surgeons turned to the less supportive autogenous auricular cartilage and devised ways of using it effectively. In 1964 Cronin, for Converse, described taking a long narrow ellipse of auricular conchal cartilage, slicing it into two slim strips, suturing them back to back, except at the upper end, and then inserting this bifid support into the tip above the medial alar crura.



In 1970 in Saigon, Mark Gorney of San Francisco constructed his auricular gull-wing graft. In 1972 and 1973, with Edward Falces, he published a description with these diagrams and models in *Plastic and Reconstructive Surgery*.



A spoon-shaped piece of auricular conchal hollow cartilage is removed through an anterior or posterior incision. The cupped end is split so that the cartilage curls out like a pair of gull wings. The remaining shaft is scored down its mid-vertical length, folded back on itself for reinforcement of the stem and fixed with sutures.



The gull-wing graft is introduced through a mid-columella incision which "heals to near invisibility," but Gorney and Falces warn:

Do not bring the incision onto the tip proper, especially in dark individuals.

Of course, many have continued with autogenous rib cartilage struts, but most surgeons consider this adjunct more or less optional. Victor Spina has not been so tolerant on the subject, proclaiming a costal cartilage strut absolutely essential in the bilateral cleft lip nose.

In 1974 Musgrave and Garrett stated, with respect to their columella lengthening:

A strut of preserved rib cartilage is almost always incorporated in the small child although occasionally we have used the tail of the helix as an autogenous cartilage graft. This inverted obelisk-like graft is anchored to the deficient distal septum with two transverse mattress sutures of 5-0 white silk.

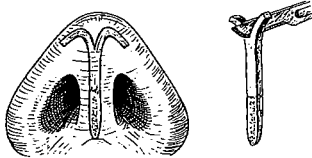
In 1964 I proposed septal cartilage struts for this purpose and still feel that, when available, this is the best method by far. In the symmetrical bilateral cleft secondary deformity there should not be much deviation of the septum, and unless some overenthusiastic otolaryngologist has gotten ahead of us, cartilage for grafting should be ample. Long, slim, straight, stiff struts of septal cartilage, resting on the nasal spine and running up through the columella, will give lift and definition to the tip. It is important not to make the strut so long that the tip skin blanches over its end at rest, or even with smiling. The septal cartilage is stiff enough to be effective and slim enough to allow the insertion of two pieces for extra and symmetrical tip lift and still maintains a sleek column.

In 1967 Paul Tessier of Paris suggested splitting the tip of the septal cartilage strut so that it curled over on each side, not unlike a fleur-de-lis, presenting quite a natural and benign tip for nasal support.

Otto Neuner of Berne proposed the nasal hump, when there is one, as a good tip support in cleft lip cases.

In 1972 J. Pollet of Paris was reported by Stephenson for the 1974 *Year Book of Plastic and Reconstructive Surgery* also to advocate use of the nasal hump:

The nasal hump removed as a block and thinned can constitute an osteo-cartilaginous graft whose bony portion is osteosynthesized to the nasal spine and the portion corresponding to the triangular cartilage is sutured to the septal portion. If the hump is too short, a wider piece including the lower septal edge attached to the hump can be removed. The nasal hump with its septal expansion constitutes a large graft whose anatomy is similar to that of the alae with the dome and the lateral crus.



Editor Kathryn L. Stephenson's personal comment noted that Pollet gives Tessier credit for the trifoil-type support and compared this with the auricular gull wing of Gorney:

The septal cartilage has the advantage of giving a bit more rigidity and would possibly be more useful for the secondary repair of cleft lip nasal deformity, where the tissues are scarred and heavy.

No one seems concerned that when the hump is short so much additional septum will have to be removed from the bridge that there is a good chance both tip and bridge may then need support!

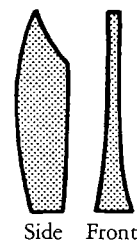
In 1974 Oneal, Greer and Nobel, of the University of Michigan, suggested temporary and permanent cartilaginous support immediately after the banked forks have been shifted into the columella for nasal tip release:

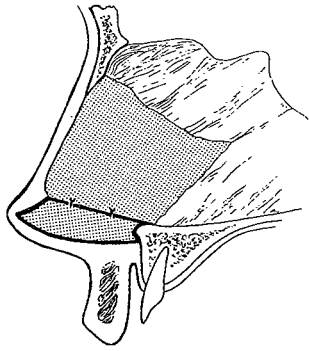
We attempt to place the prominences of the "banked" flaps at the base of the columella. . . . This should rotate the medial crura upward and raise the tip of the nose. We have noted some tendency of the tip of the nose to settle with healing. [This may be similar to the mechanism Anderson has discussed for the "pollybeak" deformity following rhinoplasty due to lack of medial crural thrust and downward pull of the healing scar tissue in the transfixation incisions.] This observation has prompted us to insert a columellar strut of septal cartilage between the feet of the medial crura and the premaxilla in older children. In young children, we use irradiated costal cartilage. Even if this cartilage absorbs, it may function initially as support until the active scar tissue phase is passed.

I think this last point is an interesting thought, but I suggest homologous septal cartilage banked in antibiotic solution may be a better early temporary tip support.

### BOWIE KNIFE STRUT

David G. Dibbell of the University of Wisconsin in 1976 advocated support of the cleft lip nose with a costal cartilage strut shaped like a Bowie knife with the butt of the handle resting on the nasal spine and the scooped tip allowing nasal tip definition. He reported using it in conjunction with a forked flap in secondary bilateral cleft lip nasal corrections. He obtained cover of this graft with forward advancement of the septal mucosa on each side of the septal cartilage to be sutured to the forked flap. As a testimonial to both the forked flap, which Dibbell graphi-





cally referred to as the “elephant’s trunk” approach, and his special costal strut, he presented two bilateral cleft cases with impressive secondary nasal corrections.

It should be noted that if this Bowie knife-shaped strut is desired, it often can be cut quite well from septal cartilage. In fact, I cut a Bowie knife-shaped strut out of septal cartilage for a retracted columella the day after I read Dibbell’s description. The case appears in Chapter 17.

### STRUTTING COMPOSITE EAR GRAFTS

Composite auricular chondrocutaneous grafts to the columella, of course, carry their own thin built-in cartilaginous support. As already noted, Robert Meade adds an extra auricular cartilage strut in back of his composite ear graft at the same time to bolster further this portion of the new columella. Certainly ear lobe grafts warrant a cartilage strut at the time of grafting or as a secondary procedure to give a “little spine to the marshmallow.”

### PLASTICS

Although there are exceptions to all rules, in general it is my feeling that the silicones and other synthetic foreign bodies should be avoided when possible in the support of the cleft lip nose. They are the “easy way,” and undoubtedly one will sneak by occasionally. Yet when they are inserted into scarred tissue in superficial positions where there are demands for adequate thrust and long-term active support, the chances of a happy ending are by no means constant. As Kilner once said,

They are the Royal Road to contour,

but he promptly dismissed them without reservation.