

*ORIGINAL SCIENTIFIC PRESENTATION*

## The Double Columellar Strut: An Adjunct To Improve the Nasal Tip

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**Introduction:** A technique for obtaining consistent and optimal tip results using a combination of a long double columellar strut with a double dome suturing technique has been utilized over the past 20 years.

**Materials and Methods:** Septal or auricular cartilage is harvested, split lengthwise, and secured to itself with suture or tissue glue to form a long (1.5-2.5 cm), straight, double-laminate cartilage graft. This graft is then secured between the medial crura with a suture passed through the lateral and medial sections of each dome.

**Results:** A total of 245 patients who underwent this particular tip technique were evaluated. With the exception of 3 cases that had inadequate tip support, all cases demonstrated consistently adequate tip support, narrowing without pinching, adequate tip elevation, and no significant complications. Transient edema and mild erythema were noted in nearly all patients. Thirteen revisions were performed for inadequate support (5), inadequate lowering of the cartilaginous dorsum (3), reduction of columellar strut length (2) and partial turbinectomy to improve airway obstruction (3).

**Conclusion:** The double columellar strut combined with the double dome tip technique should be considered when one is confronted with poor tip projection, poor medial crural strength, drooped tips, or dependent or tension tips, or in any case for which maintaining adequate tip projection is a matter of concern.

Numerous tip techniques have been described in the literature.<sup>1-21</sup> Some of the older, traditional techniques sacrificed a natural appearance to attain an improved appearance. Perhaps, for this reason, doctors and the public often perceive the results as “surgical,”

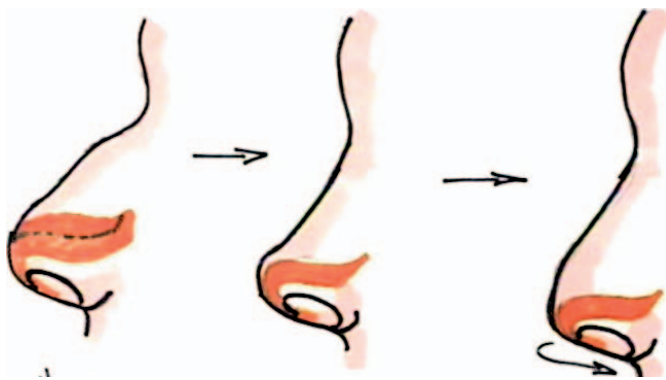
meaning artificial and distracting. Most surgeons today strive for natural appearing noses, and the tip is recognized as the most difficult part to consistently sculpt. When the tip has good projection on its own with minimal width between domes, most surgeons can achieve good results. Difficulty in obtaining consistently reproducible results is more common with wide tips, tips with poor projection, or tips with poor medial or middle crural support (Figure 1). Many different techniques, including suturing, Goldman-type procedures, shield tip grafts, double dome suturing techniques, pre-maxillary bolsters, and indeed, columellar struts, have been discussed. For these more difficult noses, combining the techniques of double dome suturing, as described by McCollough, with the placement of a long double columellar strut between the medial crura and domes yields more consistent results without sacrificing some aspects of natural appearance.

Having known about and used many of the available tip techniques over the 26 years I have been in private practice, I was most impressed by the utility of the technique espoused by Dr McCollough (via Walter Berman, MD). Basically, he described a technique where the cephalic sections of the lower lateral cartilage were trimmed first after adequate exposure following the delivery technique. The dome was then narrowed by suturing the lateral and medial parts (or middle parts, as described by Sheen) of the dome together. The dome was incised and trimmed if necessary, then the right and left dome complexes were sutured together. This procedure has the utility of the dome-splitting techniques without as much risk for pinching. It is fairly effective in reducing projection and even maintaining projection if adequate medial crural support exists. However, on thin-skinned individuals, it too can present with pinching. If medial crura support is inadequate, even with over correction, the tip may eventually drop. If the lower lateral crura

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**Figure 1.** A tip with poor tip support (dependent tip) may look good at first, but ultimately will fall back, resulting in an underprojected or drooping tip.

are too long, they may push the tip downward and cause a drooping tip. This can be remedied by cutting the lateral crura and setting them back, but medial tip support is still critical for proper projection.

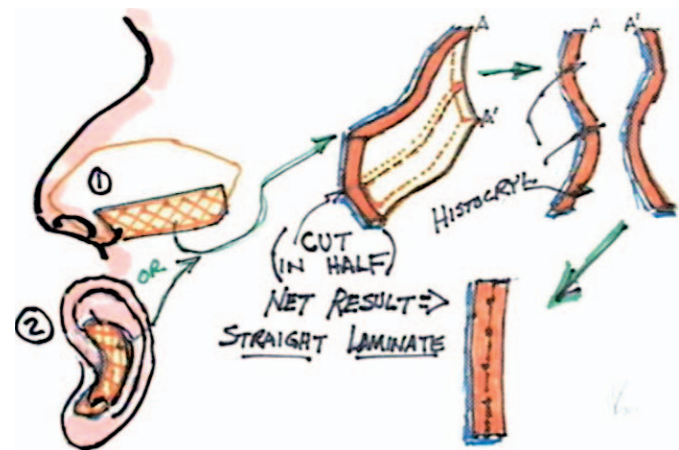
The columellar strut, placed or sutured between the medial crura, is not a new concept. It has been advocated as one possible method of adding support to the medial crura to aid in tip projection. The single columellar strut may have certain disadvantages. When used as a long strut, commonly in septal cartilage, if slightly curved it can leave the tip twisted to the side. The single strut may protrude, leaving a singularly pointy tip. Often, the single strut is just too weak to support the medial crura and domes in the new position. The columellar strut has also been described as a small piece of cartilage used to bolster the medial crura anteriorly, which may be accomplished by suturing the medial crura upon the strut (Figure 2). This



• McCollough Technique

• With Long Double Columellar Strut

**Figure 2.** The tip technique described by McCollough (and originally, Walter Berman) brings both domes together. Addition of the double columellar strut further maintains tip support while preventing overnarrowing (pinching) of the tip.



**Figure 3.** Cartilage can be harvested from the septum or the auricle. Because cartilage is often naturally “warped,” cutting it in half and securing the same side surfaces to each other “cancels out” the curves and yields a straight laminate.

may be a good procedure, if the domes are in good relative position and only lack projection. Daniel described a significant columellar strut made from rib cartilage, wedged at the base and secured to the nasal spine via a suture passed through a drill site.<sup>11</sup>

### Technique

By using a double layer of cartilage for the columellar strut, one can gain significant advantages. Simply, these would include increased projection that (1) is straight, (2) is strong, and (3) avoids pinching of the tip. The columellar strut should be 3 to 4 mm wide, or approximately the width of the medial crura and the desired dome area. Typically, the strut material is easily harvested from the septum, although the auricular cartilage can be used as well. A section of cartilage at least twice as wide as needed is carefully harvested, with the goal of getting as long a segment as possible. Because the septal cartilage is rarely straight, when it is cut lengthwise in half, it can then be sutured, or preferably glued, so that either both right or both left sides are opposing each other. By doing this, one will negate the curve of the septum and get a straight strut. This can be done as well with auricular cartilage. Occasionally, subtle advantages are obtained with opposing convex or concave surfaces. For example, opposition of convex surfaces will tend to position the domes slightly wider in position. By laminating the cartilages together (suture or tissue glue), one also achieves a considerably stronger material. If the tissues are especially thin, 3 layers can be laminated to further improve stability (Figure 3).



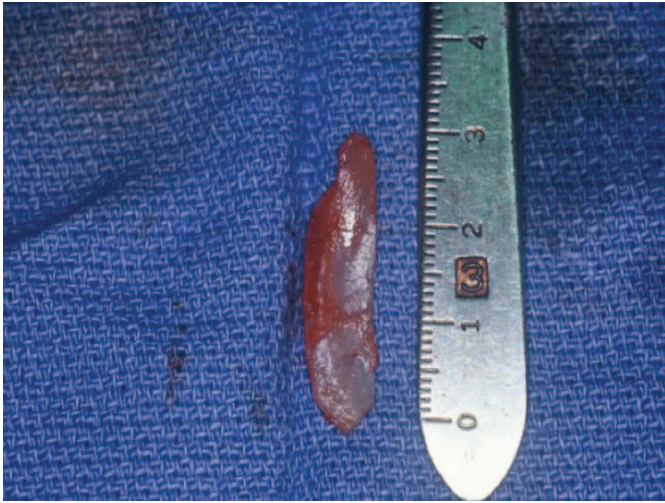
**Figure 4.** Patient demonstration. Mild hump deformity with dependent tip.

After the double columellar strut has been gathered and prepared, the lateral crura are delivered through marginal and intercartilaginous incisions. The cephalic segment is trimmed as necessary. Then the right and left domes are narrowed by suturing the lateral and medial segments together with a 5-0 gut suture. The double columellar strut is placed in a pocket between the medial crura. The pocket needs to be between the medial crura but should not be overdissected, nor should it extend down to the nasal spine. An adequate base of soft tissue under the strut supports the tip adequately. Slight (1–2 mm) overcorrection is recommended to make up for intraoperative tissue edema. This can be done through an open or closed technique. It has been my preference, particularly in unoperated noses, to use the closed technique because more uniform stretching of the tip skin is possible. With the open technique, tension at the suture line can be excessive. Once the double columellar strut is in place, a suture (eg, 4-0 Monocryl) is passed through the right domal complex, the strut, then the left domal complex, and back again. It is tied off on the side where it



**Figure 5.** After lateral, medial osteotomies and lowering dorsum. Tip still dependent and falls back.

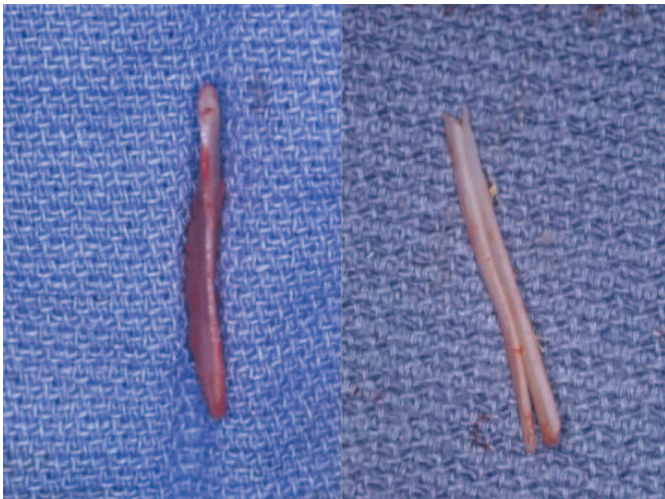
started. Before the cartilages are secured together with the suture, the strut is trimmed and checked for appearance by placing it into its pocket. The top of the strut should be shaved and rounded off to avoid sharp edges. If the skin is particularly thick, one might leave extra projection from the columellar strut to maximize tip projection and narrowing. If the skin is thin, then the domes should approximate the top of the strut to avoid a tent pole protrusion. Once the position appears adequate, the entire complex is secured together. Ultimately, one is left with a cartilaginous tip that is now 6 to 7 mm in width—wide enough to avoid pinching, yet narrow enough to make a wide nose look aesthetically pleasing. Internal incisions are closed with running 5-0 gut, starting on the right marginal incision, passing through to the left marginal incision, back by the left intercartilaginous incision, through to the right transfixion incision, then back and forth through the septum to close off the dead space, ultimately coming out on the right and finishing by closing the right intercartilaginous incision. No packing is used, and bacitracin ointment is applied, as is a splint and a moustache dressing (Figures 4 through 9).



**Figure 6.** Septal cartilage graft harvested from inferior septum a few millimeters back from the caudal area.

### Results

All rhinoplasty cases employing the double columellar strut over the past 20 years were evaluated. The technique was used in 245 patients. In 5 cases, the projection was not maintained because the strut was inadequate or the base was overdissected and the strut descended too far. In most cases, temporary erythema and edema of the columella occurred. No incidences of infection occurred and no evidence was found of rejection reaction related to using tissue glue between the cartilages. Revision surgery was performed in 13



**Figure 7.** On the left: Section of cartilage demonstrating slight warp. This piece is actually fairly straight. On the right: Cartilage trimmed in half and sutured together (can use tissue glue) provides a straight laminate that is 2 to 3 mm wide.

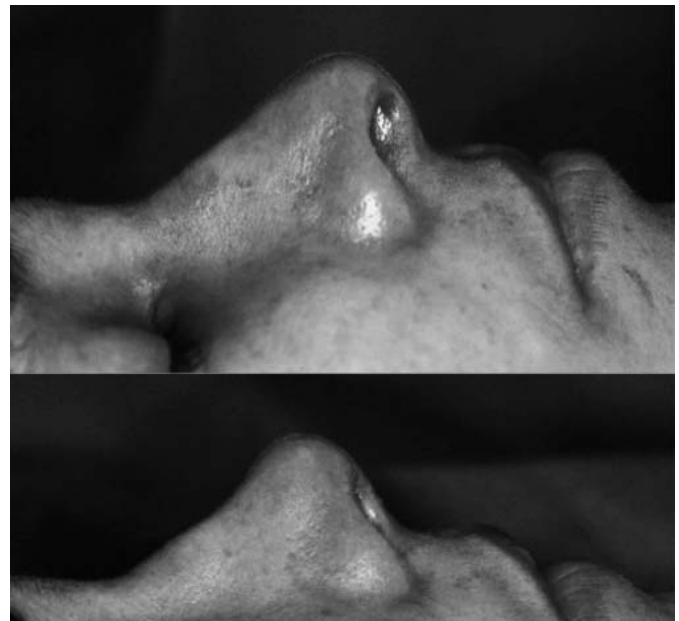


**Figure 8.** Long double columellar strut secured between medial crura with 4-0 Monocryl suture.

patients. Five required additional tip grafting, 2 had to have the strut reduced slightly, and the others procedures were performed for minor dorsal defects. The remaining patients maintained straight, adequate, nonpinched tip projection (Figures 10 through 14).

### Discussion

This procedure seems to work well with any tip for which there is concern about maintaining adequate tip projection. Its biggest problems occur when the septal



**Figure 9.** Slight overprojection seen immediately on the table.

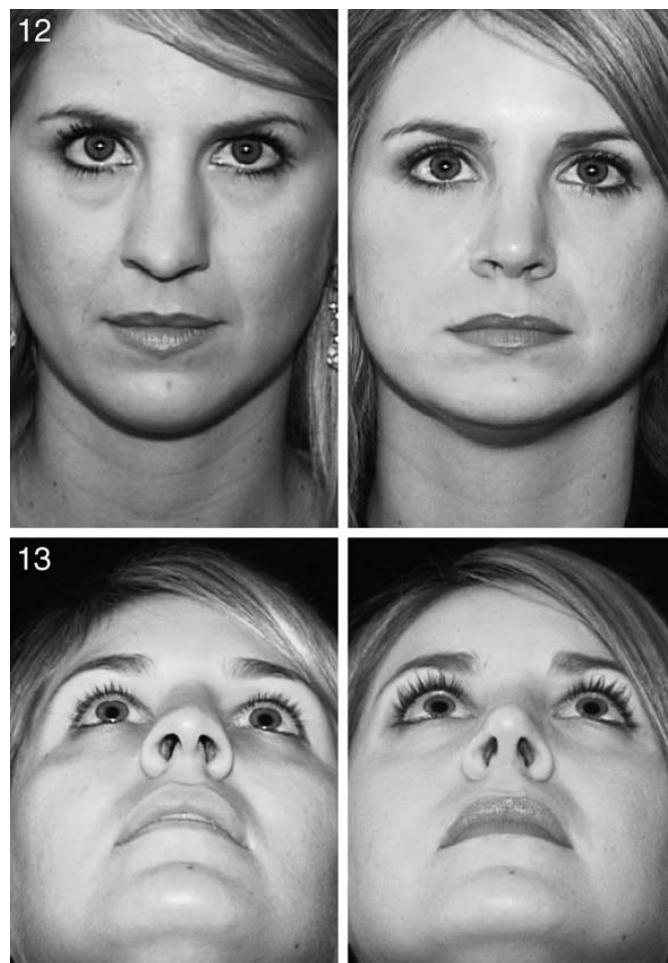


**Figure 10.** Patient from demonstration seen 1 year after operation.

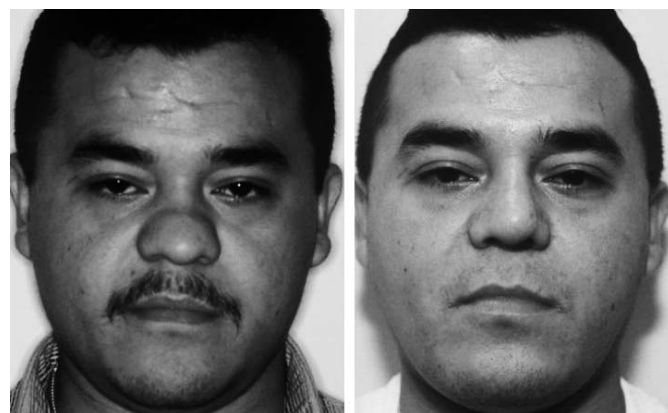
**Figure 11.** Patient from demonstration seen 1 year after operation.

cartilages are particularly short. This can be dealt with by harvesting ear cartilage or by making a triple-laminated strut. Harvesting a septal cartilage strut with bone attached is possible but more difficult.

It has been suggested that I have been losing tip projection by virtue of complete transfixion incisions made while performing a delivery technique. I have tried other techniques for securing adequate projection but have found them less reliable. Very often, before performing rhinoplasty, we start with a nose for which we simply want to maintain projection. In many cases, however the surgeon may not have adequate support. Often the tip is being supported by the septal cartilages and not the medial crura—the dependent tip. Recessive pre-maxilla and aging faces that lose fat in the upper lip are other examples of loss of tip support. These can be aided by pre-maxillary grafts or sometimes fat grafts, as well as by double columellar struts.



**Figures 12 and 13.** Patient with wide nose—both bony and cartilaginous. The tip shows poor projection and wide and laterally displaced domes. Rhinoplasty done by delivery technique: trim cephalic lower lateral cartilages, place long double columellar strut, and suture domes and strut together. Front view and base view.



**Figure 14.** Very wide tip with thick skin. Double dome tip/double columellar strut technique to narrow and increase tip projection.

This technique for such dependent tips has become remarkably routine for the author. Its utility when combined with the double dome suture technique (McCollough) is nearly universal. It provides a straight, strong strut with enough combined thickness to prevent pinching of the tip. Its use should be considered when one is confronted with poor tip projection, poor medial crural strength, drooped tips, or dependent or tension tips, or for any case for which there is concern about maintaining adequate tip projection.

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