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CASE REPORT
Cosmetic

Correcting Caudal Septal Deviation with a Modified Horizontal Mattress Suture

Ritwik Grover, MD
Nargiz Seyidova, MD
Hassan Alnaeem, MD
Samuel J. Lin, MD, MBA, FACS

Summary: Correction of caudal septal deviation remains surgically challenging, given its imperative function as a nasal tip stabilizer and factor in tip projection, as well as its impact on the nasolabial angle and length of the nose. Although various procedures have been devised to repair the caudal septum using grafting techniques, correction with minimally invasive isolated suture techniques is limited. In this case report, we describe a modified horizontal mattress suture to correct caudal septal deviation in a patient undergoing revision septorhinoplasty. The patient followed up for 2 years after the surgery, and correction of the anterior caudal septum deviation remained intact. *(Plast Reconstr Surg Glob Open 2021;9:e3988; doi: 10.1097/GOX.0000000000003988; Published online 17 December 2021.)*

Deviations of the anterior, or "upper," caudal septum can present a significant corrective problem for the rhinoplasty surgeon. Although the mid- and posterior septum may be judiciously excised without untoward effects to the support structure of the external nose, the dorsal and caudal septum are integral to maintaining stability.[1] When deviations of the anterior-most caudal septum occur, there is understandable caution about utilizing deconstructive techniques. Deconstruction and reconstruction become even less appealing when a secondary rhinoplasty patient presents who has already had septal cartilage harvested, leaving a scar around the L-strut while possibly requiring alternative sources of cartilage for graft material.

A healthy 39-year-old woman presented with right-sided external valve findings due to deviation of her anterior caudal septum. She had a previous open septorhinoplasty and had noticed warping of her caudal septum. The deviation of the remaining L-strut was causing a narrowing of the right external valve at the level of the nostril apex and breathing obstruction. The patient was seeking a closed approach given her desire for minimal recovery time and to avoid additional donor site incisions.

As depicted in Supplemental Digital Content 1A, the right nostril apex was narrowed and was causing increased airway resistance based upon the curvature of the residual anterior caudal L-strut. (**See figure, Supplemental Digital Content 1,** which shows (a) the intraoperative assessment of the right nostril apex, (b) intraoperative visualization of the rightward c-shaped deviation of the caudal L-strut, and (c) the illustration of suture technique. **http://links.lww.com/PRSGO/B859**.)

INTRAOPERATIVE FINDINGS

There was a complete absence of septal body cartilage due to her previous procedure. Intraoperatively, an 11 mm dorsal and caudal L-strut was found remaining after elevating bilateral mucoperichondrial flaps (**Supplemental Digital Content 1B**, **http://links.lww.com/PRSGO/B859**). The anterior caudal strut was curved into the right nare in a c-shaped convex deformity, distorting the columella and narrowing the right external nasal valve. The anterior nasal spine was midline. The patient's existing cartilage caudal septum was of good quality thickness, and so we felt that two sutures could be carefully placed without the detriment of the cartilage support of the nasal tip.

TECHNIQUE

The right nostril apex was narrowed with the anterior rightward caudal septal deformity (**Supplemental Digital Content 1A**, **http://links.lww.com/PRSGO/B859**). After standard exposure of mucoperichondrium, the caudal L-strut was cleared of mucosa and the rightward c-shaped deviation of the caudal L-strut could be visualized (**Supplemental Digital Content 1B**, **http://links.lww.com/PRSGO/B859**).

From the Division of Plastic Surgery, Beth Israel Deaconess Medical Center, Boston, Mass.

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A modified horizontal mattress suture technique was used to straighten the curvature without any further resection of the L-strut. A 4-0 PDS on a PS-2 needle was used in a horizontal mattress fashion spanning 1 cm in length. The suture needle was passed from the concave side of the deformity in a full-thickness, 1 cm pass from lateral inferior/anterior to superior/anterior. The needle was then passed from lateral superior/posterior to medial and from there to medial inferior/posterior to complete the modified horizontal mattress suture (blue suture, **Supplemental Digital Content 1C**, **http://links.lww.com/PRSGO/B859**). This was then secondarily reinforced with a second suture below the first (red suture, **Supplemental Digital Content 1C**). The suture was tightened with a slip knot to achieve the correct tension until the preexisting convexity straightened toward midline. Given that the deviation was 2 cm in length, a second suture was applied immediately inferior to the first (**Supplemental Digital Content 1C and Video 1**). The caudal septum changed from curved to straight after suture placement. This suture technique utilizes the "loop" of the horizontal mattress to exert a corrective straightening effect on itself. The ligamentous attachments to the nasal spine were left in place. (**See Video [online],** which demonstrates the modified horizontal mattress suture technique.)

FOLLOW UP

The patient followed up for 2 years after the surgery. She was happy with the results and reported improvement of her breathing obstruction. The correction of her anterior caudal septum deviation remained intact at her 2-year follow up visit.

DISCUSSION

Repair or reconstruction of the caudal septum is difficult, given its imperative function as a nasal tip stabilizer and tip projector, as well as its impact on the nasolabial angle and length of the nose. In the past, rhinoplasty surgeons have advocated a reconstructive approach utilizing cartilage cantilever grafts to recreate the septal angle and caudal septum: compressing the septum between spreader grafts and upper lateral cartilages into a five-layer sandwich.[2] Although this approach of restoring anatomy with similar tissue is useful for L-strut fractures and saddle-nose deformities, it is undoubtedly a more invasive approach. On the contrary, for those patients with mild-to-moderate caudal septal deviations, a less invasive approach such as the suture technique presented here may be more suitable.

Minimally invasive techniques for caudal septal deviation and reconstruction is not a new concept. A full transection of the caudal septum at the site of deviation with reinforcement with a batten graft has been described.[3] Others have described a cross-suture technique, requiring only a unilateral mucoperichondrial flap elevation followed by a wedge resection of the deviated cartilage and two loop mattress sutures above and below the excised region.[4] Multiple techniques have been described for caudal septal deviation correction using grafting techniques; however, correction with isolated suture technique as described in our paper is limited.[3–16] One of these articles had some similarities to the technique we described. However, in comparison with our technique, the previous author separated cartilage from the maxillary crest by excising a thin strip of cartilage. Furthermore, position of the suture as well as usage of the single suture differed from our technique.[15] The concept of our technique applied for caudal septal deviation correction is similar to the Mustarde technique used for otoplasty.[17]

Ultimately, the caudal septum may be an important, understated cause for recurrent airway obstruction after septoplasty, given its potential to warp.[18] When utilizing deconstructive techniques, fracture or buckling of the caudal septum and subsequent loss of tip projection or saddle-nose deformity may occur.[19–21] Conversely, suture techniques can forego the risk of caudal septal instability and scar, and can effectively treat minor to moderate septal deviations. For this reason, some authors have left the caudal septum untouched for deviations relocating the anterior nasal spine when appropriate.[22] Although we used the PDS suture, which has an absorption rate of 182–238 days, the patient was followed up 2 years later and caudal septal corrections remained intact during this period.[23] This finding could be explained by the fact that 2–12 weeks are required to form scar tissue and maintain permanent shape. Therefore, cartilage shaping does not depend on durability of the suture material after formation of the scar.[24]

Caudal septal corrections can be even more challenging than septal body corrections because of the caudal septum's integral role in columellar configuration. Septocolumellar suture techniques have been described, avoiding destruction of the caudal septum by using the medial crura and columellar soft tissue as anchors for relocating the caudal septum to midline.[8,13,25] However, relying on malleable soft tissue as an anchor can shift tip location and columellar configuration and with the anterior caudal septum being adjacent to the columellar-lobular breakpoint, alterations in tip configuration can occur with this technique. This soft-tissue anchoring method of caudal septal reconfiguration may be more useful near the posterior caudal septum adjacent to the nasal spine and farthest from the nasal tip. Thus, in our case, our best option was to use a suture technique on the deviated portion of cartilage itself, without involving the surrounding soft tissues of the nasal tip complex.

CONCLUSIONS

The caudal septum represents a difficult region of the nasal structure to reconstruct or repair without a risk to its integrity. This case highlights a straightforward-to-execute suture technique for correcting the concave deformity (c-shaped) of the caudal septum deviation closest to the nostril apex.

Samuel J. Lin, MD, MBA, FACS
110 Francis Street Suite 5A
Boston, MA 02215
E-mail: sjlin@bidmc.harvard.edu

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