CORRECTION OF CAUDAL SEPTAL DEVIATIONS VIA CLOSED RHINOPLASTY APPROACH

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ABSTRACT

Objective: To introduce the combined technique of nasal spine stitching and partial tongue-in-groove for the management of caudal septal deviation and to evaluate the surgical outcome and its efficacy.

Study Design: Quasi-experimental study.

Place and Duration of Study: Ear, nose and throat (ENT) Department Combined Military Hospital (CMH) Lahore from September 2013 to February 2015.

Material and Methods: Ninety three patients with caudal deviation were included in the study. Caudal septal deviation was corrected employing both Modified Kriedel's and Pastorek's technique via endonasal approach. Nasal patency was determined using the alpha-version of "Nasal Obstruction Symptom Evaluation" (NOSE) Scale.

Results: NOSE Scale scores were checked pre operatively and three weeks post surgery. Post operatively 88 (94.6%) patients had satisfactory nasal patency (NOSE Scale score fell by 15 points). Five (5.4%) patients who did not have satisfactory score had revision surgery.

Conclusion: Combination of Pastoreks's and Kriedel's technique gives accurate correction of caudal dislocation.

Keywords: Caudal septal dislocation, Nasal spine, Tongue-in-groove.

INTRODUCTION

Caudal septal deviations are a common occurrence. Caudal septal deviations cause nasal obstruction as the narrow of the nasal valve area (narrowest region of nasal passage) is located between the caudal edge of the upper lateral cartilage and the nasal septum. Additionally the caudal deviation often leads to drying, crusting and epistaxis. The caudal deviation also leads to cosmetic problems. Regardless of the problems associated with caudal septal deviations, while correcting it the difficulty in dealing with caudal deviation lies in the fact that deviated caudal septum also has a C shaped deviation. Medial crus on the concave side is often elongated and weakened, external deviation of cartilaginous nose to side of deviation, deviated caudal septum which also forms the caudal support of nose, hence cannot be removed.

Approach to caudal septum has traditionally been described with both open and closed approach. Open approach offers the additional comfort to restructure external deviations as well as allowing for adequate repositioning of the septum with correction of other septal deviations. The most challenging method is to perform correction using endonasal approach. Literature research has shown that caudal septal correction can be done using three techniques Kriedel’s technique (tongue-in-groove), Pastorek's method (door stop), or Caudal Batten graft. Tongue-in-groove technique as described by Kriedel is an effective method in straightening the deviated caudal septum, as it sandwiches the deviated caudal septum between the two medial crura for support. Tongue-in-groove technique has also been used through an endonasal approach. Pastorek described a method where the anterior nasal spine is used as a door stop to reposition the caudal septal deviation. Pastorek's method deals effectively with lower part of caudal septum but fails to address the top two thirds. Kriedel's technique effectively repositions the

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upper two thirds but is weak in correcting the base of septum.

This study combines the two techniques of Pastorek i.e. using the anterior nasal spine as a door stop to reposition the deviated caudal spine and Kriedel's tongue in groove technique to secure the deviated caudal septum. This technique differs from classical Kriedel method in that; the caudal nasal septum is stitched to only one medial crus (opposite to the deviated side i.e. the convex side). Securing the cartilage via a septocolumellar stitch allows for accurate repositioning.

MATERIAL AND METHODS

After approval of hospital ethical committee, the research was conducted as a quasi experimental study at Combined Military Hospital (CMH) Lahore from September 2013 to February 2015. Non probability consecutive sampling technique was applied, and 93 cases of caudal septal dislocation were included using "WHO Sample Size Calculator". All patients had detailed ear, nose and throat (ENT) examination, and patients underwent septoplasty by intranasal route using Freer's incision. Patients with revision surgery and multiple trauma were excluded from surgery.

This is a technical overview presenting the steps involved in combining the two techniques with advantages over other methods such as septocolumellar suture. Mucopericondrial flaps were raised on both sides. After doing a standard septoplasty, caudal part of septum was dissected of the nasal spine and deviated septum was corrected by stitching it to nasal spine using Prolene 4/0 (Pastorek's technique).

Medial crus opposite to caudal deviation was dissected only on its medial aspect for a length of 10 mm, keeping its attachment to collumellar skin intact on lateral side. Deviated septum was stitched to opposite medial crus of lower lateral cartilage using Prolene 4/0 (modified Kriedel's technique) as shown in fig-I. Silastic nasal splints were placed bilaterally in both nostrils to stabilize the corrected septum.

Both nasal cavities were packed with paraffin gauze for hemostasis.

Paraffin nasal packs were removed after 24 hours. Nasal splints were removed on 7th postoperative days. Nasal toilet was done on 3rd, 7th, and 10th post-operative days. Patients were given tablet clarithromycin 250 mg twice a day, tablet ebastine 10 mg twice a day, tablet Ibuprofen 200 mg three times a day for five days. Final result was checked on 14th post-operative day. Nasal patency was gauged using the alpha-version of "Nasal Obstruction Symptom Evaluation" (NOSE) Scale.

Evaluation" (NOSE) Scale, developed by American Academy of Otolaryngology–Head and Neck Surgery Foundation (fig-II). The proforma was given to the patients before and three weeks after surgery. The NOSE instrument covers

Figure-1: Exposure of left medial crus.

Figure-2: Nasal Obstruction Symptom Evaluation (NOSE) Scale.

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eleven areas with each being scored from 0 to 4. Maximum score can be 44 and minimum 0. Subjects included in surgery all had score 35 or above. Postoperatively adequate nasal patency was considered if score fell by at least 15 points. All data were analyzed using SPSS (version 13.0). Frequency and percentage were calculated for gender and correction of caudal deviation. Mean ± SD was calculated for quantitative variables like age. Post operative nose scores were compared with pre operative scores using paired sample t-test. A p-value less than 0.05 was taken as significant.

RESULTS

Out of 93 patients there were 64 (68.8%) males and 29 (31.2%) females. Age varied from 18 to 57 years. Mean age was 37.1 years with standard deviation of 7.34. A total of 54 (58%) patients had right sided and 39 (42%) patients had left sided caudal deviation. The results of surgery were checked on 7th post operative day after removal of splints. In 78 (83.8%) patients the caudal deviation was completely reduced, whereas it was markedly reduced in 10 (10.7%) patients. Five (5.5%) of the cases required a revision surgery to correct residual caudal deviation.

Table-I: Comparison pre & post operative nose scale scores.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Pre Operative NOSE Scale score</th>
<th>Post Operative NOSE Scale score</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOSE Scale Scores</td>
<td>39.67 ±2.91</td>
<td>18.82 ±5.02</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

NOSE scale scores were checked preoperatively and three weeks post surgery (fig-2). All patients had pre operative score of 35 or more (mean 39.67 with standard deviation of 2.91). Post operatively 88 (94.6%) patients had satisfactory nasal patency (NOSE Scale score fell by 15 points) mean 18.82 with standard deviation of 5.02. Five (5.4%) patients who did not have satisfactory score had revision surgery(mean 32.4 with standard deviation of 5.79) (table-I).

DISCUSSION

The magnitude of nasal obstruction in a caudally deviated septum is perplexing predominantly due to the fact that the deviation is bounded laterally by nasal valve area. Presence of tissue memory phenomenon further hampers the surgical solution in long term. The fact that literature is filled with various techniques to correct the caudal septal deviations points to the reality surrounding the difficulty encountered in successfully alleviating this condition.

In our study post operative nose scores were found to be significantly better than pre-operative scores with p-value <0.001.

The first every description of L-shaped strut having a caudal and dorsal strut was put forth by Freer. His teaching was that in any septoplasty the L-shaped strut must be maintained to avoid external nasal deformity. The dorsal strut prevents saddling and the caudal strut maintains tip projection. The first ever description of a procedure to correct caudal deviation was by Metzenbaum. His teachings were paramount in understanding the concept of preservation for nasal support. He advocated a "swing door" technique for mobilization of the caudal septum to the midline.

Ellis built on Metzenbaum's technique by using Mustarde-type sutures on the concave side to support and correct the deviation. An ethmoidal bone graft has also been described on either end of caudal septum for added strength, but the study has its limitations due to the paucity of patients. The same principle has been reexamined by Chung et al and re applied using a caudal septal graft to correct the deviated septum.

Pastorek advocated using nasal spine as a door stop for deviated caudal septum, by stitching the caudal septum to non deviated side of nasal spine. Sedwick modified Pastorek's approach by placing the caudal deviated cartilage...
directly on to the nasal spine and securing the cartilage using septal collumellar sutures.12

Kridel described the “tongue in groove” procedure for correction of caudal septal deviations. The technique essentially comprises of placement of the caudal septum into the groove created between the medial crura to hold it in place. Approach for this procedure is either by external or intranasal rhinoplasty.

The C shaped deformity of caudal deviation can be treated by horizontally dividing caudal strut after septoplasty and suturing it in an overlapping manner with additional support from "Baten Graft".13

Much of the thought process and surgical steps in this study have been influenced by the description of "Septocollumellar stitch" as described by Tezel. Though their technique employs stitching of the caudal nasal septum by sandwiching it between the two medial crura of lower lateral cartilage, and furthermore our technique has also employed the stitching of the caudal septum to nasal spine. This technique employs two tier approach to caudal deviation. Nasal spine stitching corrects the base of caudal septum, hitching it to medial crus to correct the caudal septum in middle and upper part.14

CONCLUSION

Combination of Pastorek’s and Kriedel's technique gives a considerably better option for caudal septal deviation correction.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

REFERENCES