

Caudal Septal Deviation Surgical Techniques

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Abstract

Background: Caudal septal repair is hard to confront in otolaryngology and plastic surgeon, due to cartilage memory. It causes nasal obstruction or esthetical problems to the nasal base and columella. Although different modalities have been described for the treatment of this abnormality, these techniques not only improve the function but also preserve or improve the appearance of the nose. **Objective:** The objective was to discuss the different surgical conservative procedures that can be used to treat alterations of the caudal septum and change the position of the cartilage in the midline and find which is the best. **Patients and Methods:** A descriptive study was conducted on 40 patients who aged 20–40 years, had attended the Otolaryngology Outpatient Clinic in Al Karama Teaching Hospital, Baghdad, Iraq, between October 2016 and March 2020, and with a history of obstructed nose; conservative nasal septal surgery was done for them depending on the severity. **Results:** Regarding the result of the type of surgery, the patients were satisfied with their esthetic and functional perfection; patients with preoperative nasal obstruction reported improved breathing. In scoring technique with (NOSE) score pre and postoperative results were 58.21 and 22.66, in reshaping technique were 60.66 and 17.21 as a pre and postoperative results and in batten graft the results were 62.34 and 20.26 as a pre and postoperative results alternatively. Reshaping and batten graft techniques are better results than the scoring technique. **Conclusion:** The study outcomes that the approaches for improvement of caudal septal deviation are safe and effective. The approach of surgery will depend on the severity of the deviation.

Keywords: Anterior septal reposition, caudal nasal septal deviation, columellar esthetics, nasal obstruction

INTRODUCTION

The caudal part of the septum gives hold to the tip of the nasal structures if bent caudal part of the septum is not predictable and dealt with by a standard septoplasty; resection and weakening of the caudal part of the septum will cause terrible esthetic and functional outcome for the patient as ptosis of the tip and irregularity which are possible to occur, and changes in the lobular and columellar relationships.^[1,2]

Anterior septal cartilage located in the narrowest portion of the nasal cavity, the nasal valve, may cause nasal obstruction.^[3,4]

Septoplasty may improve the patient's nasal airway; however, septoplasty is insufficient and not suitable for correcting the nasal airway in cases of caudal septal deviations and support of the nasal tip.^[5,6]

Causes for caudal septal deviations are numerous and can be traumatic, iatrogenic, and congenital. The nasal deformity may be due to external forces which result in distortion of the septal cartilage, and deviation of the nasal pyramid, and internal

forces, caused by growth of the septal cartilage, the purpose of surgical procedure is to maintain and reorient tissue rather than resect.^[7,8]

Surgical operation with caudal septal deviation is not easy since it is not simple to overcome intrinsic cartilage memory^[4,9] and the problems in managing functional and esthetic troubles at a similar occasion.^[10] Most methods for relocating the caudal nasal septum can be approached, either an endonasal or external approach.^[11]

Aim of the study

The aim was to express the effectiveness and restriction of closed conservative surgery in reduction caudal septal deviation.

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Submitted: 29-Nov-2021 Revised: 08-Dec-2021 Accepted: 19-Dec-2021 Published: 07-Aug-2023

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How to cite this article: Hassen NU. Caudal septal deviation surgical techniques. *Mustansiriyah Med J* 2023;22:119-23.

Access this article online

Quick Response Code:



Website:
<http://www.mmjonweb.org>

DOI:
10.4103/mj.mj_8_23

PATIENTS AND METHODS

This descriptive study was conducted at Al Karama Teaching Hospital, Baghdad, Iraq, between October 2016 and March 2020. Forty patients with septal surgery aged 20–40 years. Consent form have been obtained from all patients prior to participation. All patients had attended the otolaryngology outpatient clinic with a history of nasal obstruction without improvement with clinical treatment, in addition to examination of the deviation of the septal cartilage.

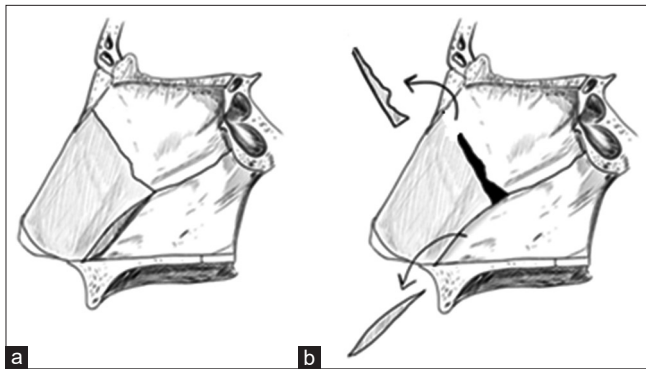


Figure 1: (a) Caudal deviation in cartilaginous septum, (b) Cephalically: Triangular cartilage is removed at junction with ethmoid bone, and ventrally: pending cartilage removed at the maxillary crest

A complete history was taken, and preoperative clinical examination with anterior rhinoscopy and nasal endoscopy was done for the patient.

The Nasal Obstruction Symptom Evaluation (NOSE) score was done pre- and postoperatively for each patient.

The patients were sent for computed tomography scan of the nasal septum to document the deviation and to exclude other nasal cavity and paranasal sinuses changes.

Photographic documentation was taken before and after surgery to show the esthetic defect before the procedure and its progress after the surgery.

Patients' photographic assessment at least 6 months after surgery.

Surgical technique

Under general anesthesia, with injecting local anesthesia (2% xylocaine) and 1:100,000 adrenalin in the nasal submucosa.

A hemitransfixion incision was done with a No. 15 blade; we elevate the mucoperichondrial flap of the septal cartilage using Freer elevator [Figure 1].

After the caudal septum was exposed on both sides and separation of the flap in a submucoperichondrial plane, with the direction of



Figure 2: (a) Preoperative, (b) At the end of surgery, (c) Postoperative

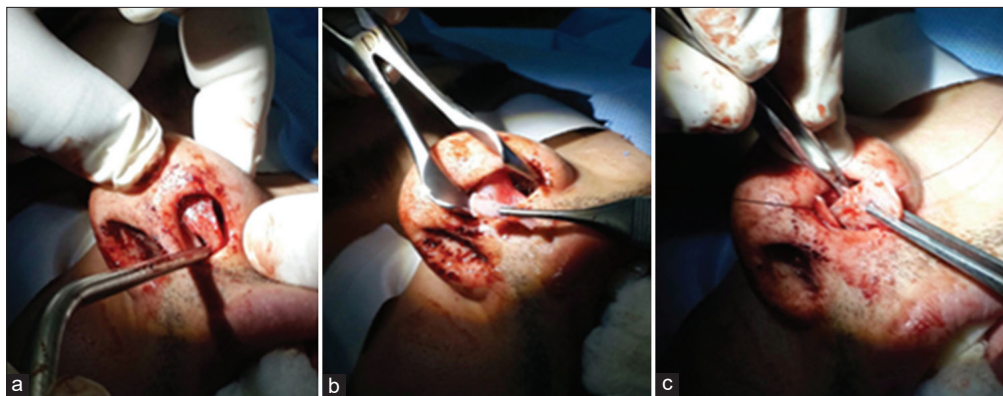


Figure 3: (a) Hemitransfixion incision, (b) Resection vertical wedge, (c) Batten graft splinting caudal septum at the concave side



Figure 4: Preoperative left caudal septal deviation and postoperative pictures

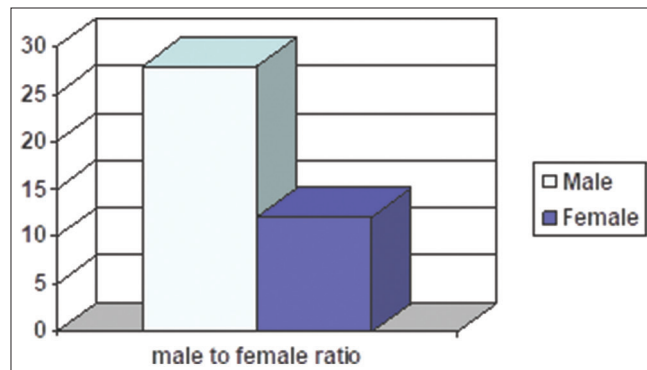


Figure 5: Male-to-female relation

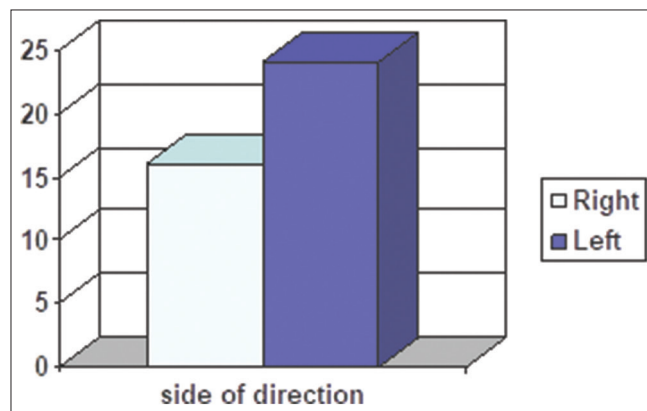


Figure 6: Right and left caudal septal deviation

the elevated flap ventrally, the cartilage was displaced from the maxillary crest; trimming of the pending division of the cartilage, the perpendicular height of the septum was reduced to permit correction of the septum to the maxillary groove so making the septum to swing to midline and fixing it to the periosteum of the anterior nasal spine using a figure-of-eight suture.

Cephalically, a perpendicular incision was done to separate the deviated caudal part of the septal cartilage from the posterior part.

If there was angulation in the caudal part with the fractured septum, we separate it by a wedge excision at the fracture line.

For mild bending caudal septum, we do scoring as partial thickness incision to the concave side, to free the intrinsic

strain in the deviated cartilage and resection vertical wedge of the posterior caudal cartilage [Figures 2 and 3].

Other technique was used in moderate caudal deviation that after scoring of deviated caudal cartilage and splinting it, we put a piece of thin flat cartilage (batten graft) from the septal quadrangular cartilage and sutured with 4.0 vicryl suture, on the concave side of the caudal septal deviation.

At the end of surgery, we do columellar pocket at the retrograde direction to the first incision to place the caudal edge of the septum with medial crura and the flap by septocolumellar suture. Bilateral internal silicon splints and nasal packing [Figure 4].

RESULTS

Of 40 patients with caudal septal deviation, 28 were male and 12 were female, as shown in Figure 5. The mean age was 25.8 years ranging from 20 to 40 years. The caudal deviation to the left side was 24 and to the right side was 16, as shown in Figure 6. The mean follow-up of the patients was 6 months.

Table 1 shows the NOSE scale. This is a scale with five questions about nasal symptoms to which patients give scores varying between 0 and 4, in relation to symptom strength. Finally, the total score given by the patient is multiplied by 5.^[3]

The NOSE scale scores of the patients' analysis preoperatively throughout the first assessment and after surgery are shown in Table 2.

Surgical techniques; the techniques depend on extent and levels of severity, and the results of each group according to the NOSE scale score are shown in Table 3.

DISCUSSION

In our study, we did an analysis (NOSE) scale before and after surgery. The mean scale scores for the patients were 60.41 ± 28.37 standard deviation [SD] before surgery and 19.91 ± 16.3 SD after surgery. It is correlated with the study by Garcia *et al.* which show close results, as 83.48 ± 7.23 SD before surgery and 7.56 ± 5.91 SD after surgery.^[3] Moreover,

Table 1: Nasal Obstruction Symptom Evaluation scale score^[3]

	No Comliant	MILD	Moderate	Bad	Sever
1 Nasal congestion	0	1	2	3	4
2 Nasal obstruction	0	1	2	3	4
3 Problems in breathing through the nose	0	1	2	3	4
4 Sleeping problems	0	1	2	3	4
5 Difficulties in breathing through the nose during exercise or physical effort	0	1	2	3	4
Total (x5): 0-100					

Table 2: Pre- and postoperative Nasal Obstruction Symptom Evaluation scale score

Parameter	Preoperative NOSE scale score	Postoperative NOSE scale score
NOSE scale score±SD	60.41±28.37	19.91±16.3
NOSE: Nasal obstruction symptom evaluation, SD: Standard deviation		

Table 3: Types of technique and the results of each group according to the Nasal Obstruction Symptom Evaluation scale score

Technique	Number of patient (%)	Preoperative NOSE scale score ± SD	Postoperative NOSE scale score ± SD
Scoring	8 (20)	58.21±21.20	22.66±17.10
Reshaping technique (swinging door and fixation to the periosteum at the anterior nasal spine)	26 (65)	60.66±34.50	17.21±13.7
Batten graft	6 (15)	62.34±29.64	20.26±15.4
Total	40 (100)	-	-

NOSE: Nasal Obstruction Symptom Evaluation, SD: Standard deviation

study with Şevik Eliçora shows 61.33 ± 20.38 SD before surgery and 21.33 ± 25.4 SD after surgery.^[12]

Controversy against this kind of technique is that by correction or not removing the deviated part of the cartilage. The deviated cartilage which is still not removed has a memory.^[7]

Central septal deviations can be removed with no harmful, compared to excisions to caudal septal deviation it will lead to effect on the external nose.^[13]

A range of procedures is planned for the improvement of caudal septal deviations. The initial procedure reported to correct caudal deviation was as a swinging-door method by Metzenbaum, for preservation for nasal support and reposition of the caudal septum in the midline based on resection of cartilage.^[14]

A number of authors modified Metzenbaum's procedure by means of nasal spine fixation of the caudal septum (modification swinging door).^[15]

In our study we applied these techniques; (i) 8 (20%) cases were operated by scoring, (ii) 26(65%) cases operated by reshaping techniques (swinging door & fixation to periosteum at anterior nasal spine) and (iii) 6 (15%) cases operated by batten graft.

In this study, surgery with the scoring technique and after 6 months, the outcome was unconvincing due to some return to deviation; Kim and Heo found that scoring incision does not assist in improved results.^[16]

The scoring procedure alone is applied to manage the convexity; it is not dependable as underscoring or overscoring leads to inadequate outcome. It is expected the scored segment to be splinted alongside a batten graft.^[17]

In reshaping technique (swinging door& fixation of the septum to the periosteum at anterior nasal spine) the outcome was good in the majority of cases as the septum transposition to the midline and convincing, the relocation of the caudal septal part done by : 1) Mobilization and displacement from the maxillary crest. 2) Cut or trim the pending division of the cartilage will permit its replacement in to the maxillary groove so making the septum to swing to midline. (3) A perpendicular incision is done to separate the deviated caudal part of the septal cartilage; the incision is prepared throughout complete width of the cartilage, first at the maxillary crest, going on upward to end as a minimum 10 mm, at the dorsal border to preserve the nasal dorsum, and (4) fixing the caudal septum to the periosteum at the anterior nasal spine with a figure-of-eight suture.^[9-11,14]

In our study, the batten grafts' outcome was good; there is progress, and the results are convincing; Wee show that batten graft was an efficient surgical procedure to correct moderate deviations of the caudal cartilaginous septum.^[18]

Hussein and Bazak reported that there was perfection of the nasal airway and no obstruction by means of the implanted batten graft.^[19]

The mucoperiosteal flap rising on both sides is frequently required in favor of the successful use of the batten graft;

septal cartilage scoring can be essential to assist to make the septum straight.^[18]

Batten graft is more dependable than only scoring as it eradicates the possibility of the remaining deviation or overcorrection due to underscoring or overscoring.^[17]

If caudal septal cartilage is weak and no viable septal cartilaginous structure is present, the bony septum is a source for the batten graft. However, there is a possibility of bone resorption. A graft made from the septal bone can cause rigidity to the caudal septum, which is not much evident if the cartilaginous septum formed as batten graft.^[17,18]

The batten graft may increase thickness to the caudal septum.^[6,18,20] However, it seldom causes nasal obstruction.^[18]

CONCLUSION

The scoring technique usually ends with a poor result; other techniques need to be used depending on the severity of the defect.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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