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Review

Endoscopic vs. conventional septoplasty: A review of the literature



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ABSTRACT

The aim of this review of literature was to compare conventional and endoscopic septoplasty in terms of operating time, functional efficacy and perioperative morbidity. A systematic review of the scientific literature was performed on the PubMed database, Google and Google Scholar, searching for randomized prospective trials comparing endoscopic and conventional septoplasty. The primary endpoint was operating time, and the secondary endpoints were intra- and postoperative complications, postoperative pain, hospital stay and functional result. Twenty-nine articles published between 1991 and 2012 compared conventional and endoscopic septoplasty, five of which were prospective randomized trials. Operating time was shorter with endoscopic surgery ($P < 0.001$), with less mucosal damage ($P < 0.01$); there was less synechia ($P < 0.01$) and residual deformity ($P < 0.05$); and postoperative pain was milder. Endoscopic septoplasty thus shortened surgery time and reduced perioperative complications, but the functional result was the same as with conventional septoplasty.

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1. Introduction

Since Freer [1] and Kilian [2] in the early 20th century, followed by Cottle et al. [3] in the 1950s, conventional septoplasty techniques have progressed [4,5]. Furthermore, advances in endoscopic nasal surgery [6,7] have led to the development of endoscopic septoplasty [8–10].

Septoplasty is a well-established procedure in nasal obstruction caused by septal deviation resistant to medical management. It also improves access to the medial meatus in sinus surgery [11]. It is presently tending to replace conventional techniques [4,5].

Many studies have sought to demonstrate the interest of endoscopy [11–25], but few involved comparison with conventional septoplasty [26–30].

The present literature review compared endoscopic and conventional septoplasty in terms of operating time, functional impact and perioperative morbidity.

2. Materials and method

PubMed, Google and Google Scholar were searched for articles on endoscopic septoplasty.

Inclusion criteria were: prospective randomized study (level of evidence I), comparing endoscopic and conventional septoplasty.

Retrospective and descriptive studies were excluded.

The primary assessment criterion was surgery time. Secondary criteria were: intra- and postoperative complications, postoperative pain, hospital stay, and functional result.

3. Results

Twenty-nine articles comparing endoscopic and conventional septoplasty, published between 1991 and 2012, were retrieved. Five concerned prospective randomized trials, and were included for analysis. Twenty-four were descriptive and/or retrospective, and were excluded.

3.1. Primary assessment criterion: surgery time

Paradis and Rotenberg [26] reported shorter operating time with his endoscopic technique (mean 24 ± 7.8 minutes) than with conventional septoplasty (mean 52 ± 12.5 minutes) ($P < 0.001$) (Table 1).

3.2. Intraoperative complications

Analysis focused on mucosal damage and intraoperative hemorrhage. Paradis and Rotenberg [26] reported mucosal damage in 11 patients managed conventionally, versus 3 in the endoscopic group ($P < 0.01$). Sathyaki et al. [30] reported twice as many cases of mucosal damage and three times as many of intraoperative hemorrhage in the conventional septoplasty group ($P = 0.023$).

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Table 1
Operating time.

| Authors | Surgery time saving | Mean operating time in endoscopy group | P |
|----------------------------------|---------------------|--|--------|
| Paradis and Rotenberg, 2011 [26] | 28 minutes | 24 minutes | <0.001 |
| Bothra and Mathur, 2008 [27] | Yes ^a | – | – |
| Gulati et al., 2009 [28] | – | – | – |
| Gupta and Motwani, 2005 [29] | – | – | – |
| Sathyaki et al., 2014 [30] | – | – | – |

^a Subjective assessment: Bothra and Mathur [27] found time saving with small spurs

3.3. Postoperative complications

Gulati et al. [28] reported fewer complications in the endoscopy group, with significant differences for synechia ($P < 0.01$) and residual deformity ($P < 0.05$).

Other reports were similar, but without statistical significance.

Sathyaki et al. [30] reported a 12% rate of delayed healing of the septal mucosa incision in the endoscopy group and none in the conventional group, but with an endoscopic technique that did not include mucosal flap suture at end of surgery (Table 2).

3.4. Postoperative pain

Gulati et al. [28] reported lower pain levels in the endoscopy group ($P < 0.01$) (Table 2).

3.5. Hospital stay

Bothra and Mathur and Gupta and Motwani had fewer long-stay patients (>48 hours) in the endoscopy group [27,29].

3.6. Anatomic results

Gulati et al. reported better anatomic results with endoscopy; the conventional group had a 20% rate (5 patients out of 25) of residual deviation, versus 8% (2 patients out of 25) in the endoscopy group ($P < 0.05$) [28].

3.7. Functional results

Both endoscopic and conventional septoplasty improved all symptoms related to septal deformity. There was no significant difference between the two, whether on subjective (NOSE

questionnaire, visual analog scale) or objective assessment (rhinomanometry, Gertner scale) [26–30] (Table 3).

4. Discussion

Endoscopy reduced operating time in septoplasty. In learning curve studies, operating time is classically used as primary assessment criterion, as it corresponds to the technical ease with which a procedure is performed along the learning curve. Paradis and Rotenberg reported a significant 28-minute time saving with endoscopy ($P < 0.001$) [26]. Subjectively, Bothra and Mathur and Getz and Hwang also seemed to have shorter surgery times. But operating time is little analyzed in the literature [19,27], and these findings need further confirmation.

Anatomic results seem better with endoscopy [33], providing significantly better anatomic correction of septal deviation [10,11,15,22]. This may be due to:

- better intraoperative visualization of anatomy, diagnostic endoscopy giving direct and precise visualization of septal deformity [10,11,17,20];
- the possibility of checking for residual deformity at end of procedure, with complementary correction if need be;
- less mucosal damage, thanks to direct visualization of the flap during detachment [26];
- the possibility of checking Silastic® sheet positioning at end of procedure.

De Sousa et al. consider endoscopy useful in patients with previous septal cartilage resection, limiting flap dissection and adapting cartilage resection and thus reducing the risk of complications and especially of septal perforation [17]. The conventional technique is performed under direct visualization, with a limited view of the operative field, making it difficult to determine the relations between the nasal septum and the lateral structures of the nose, especially in case of posterior deviation [20].

Endoscopy induces fewer postoperative complications. Less mucosal damage and good Silastic® sheet positioning may reduce the rate of synechia in endoscopic septoplasty [10,11,17,22,26]. Better anatomic visualization during flap dissection and detachment may also reduce the rate of complications [28–30].

This anatomic advantage of endoscopy, however, does not hold functionally. Objective and subjective postoperative assessment show improvement whichever the surgical technique [8,11,15,16,26–30]. Better functional results are reported with better anatomic outcome, but no statistically significant difference emerges; results need confirming on larger series.

Table 2
Postoperative complications.

| Authors | Complications | ES | CS | P |
|----------------------------------|---------------------------|-------------|-------------|-------|
| Paradis and Rotenberg, 2011 [26] | 0 | 0% | 0% | – |
| Bothra and Mathur, 2008 [27] | Hemorrhage | 0% | 15% (6/40) | >0.05 |
| | Infra-orbital edema | 5% (2/40) | 15% (6/40) | >0.05 |
| | Synechia | 25% (10/40) | 5% (2/40) | 0.18 |
| | Residual septal deformity | 15% (6/40) | 10% (4/40) | 1 |
| Gulati et al., 2009 [28] | Pain | 24% (6/25) | 64% (16/25) | <0.01 |
| | Synechia | 8% (2/25) | 36% (9/25) | <0.01 |
| | Residual septal deformity | 8% (2/25) | 20% (5/25) | <0.05 |
| Gupta and Motwani, 2005 [29] | Hemorrhage | 4% (1/25) | 20% (5/25) | 0.08 |
| | Synechia | 0% | 8% (2/25) | >0.05 |
| | Residual septal deformity | 0% | 4% (1/25) | >0.05 |
| Sathyaki et al., 2014 [30] | Synechia | 0% | 16% (4/25) | >0.05 |
| | Delayed incision healing | 12% (3/25) | 0% | >0.05 |
| | Residual septal deformity | 0% | 0% | 1 |

ES: endoscopic septoplasty group; CS: conventional septoplasty group.

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