The Journal of Laryngology & Otology
March 2001, Vol. **115,** pp. 194–197

Surgical management of septal perforation: an alternative to closure of perforation

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Abstract

The surgical closure of septal perforations remains a distinctive challenge to the otorhinolaryngologist. This is demonstrated by the modest success in most techniques. An alternative method, involving surgical enlargement of the perforation with posterior edge repair, is described and the outcome is investigated. Thirteen patients with perforations of up to 50 mm in size underwent this technique. A questionnaire interview was conducted and symptom scores were obtained. The length of hospitalization, follow-up period and post-operative complications were evaluated as were measures of morbidity.

The results showed a significant improvement in the symptom scores for nasal crusting, epistaxis and overall discomfort. This technique is straightforward and is especially suitable for larger perforations. The successful improvement in symptoms and an associated low morbidity makes it a complement to alternative surgical closure techniques.

Key words: Nasal Septum, Surgery

Introduction

The treatment of nasal septal perforations is challenging. While most patients remain asymptomatic (62.4 per cent),[1] the remainder may suffer bothersome nasal symptoms such as nasal crusting, epistaxis, pain, obstruction, discharge and whistling. These patients often require treatment for which surgery may be indicated if conservative measures fail.

In the majority of surgical techniques described, treatment centres on achieving successful closure. The aim is to restore normal nasal physiology and function. Various methods have been developed through the years aiming to achieve this goal: the advancement and suture of the perforation border,[2] the use of an oral mucosal flap,[3] temporalis fascia graft,[4,5] conchal cartilage with perichondrium and mastoid periosteum,[6] inferior turbinate flap,[7] tragal cartilage with perichondrium and temporalis fascia,[8] bone and temporalis fascia graft,[9] acellular human dermal allograft[10] and two-stage expanded mucosal flaps[11] have been described. Despite the myriad of techniques, the results of surgical closure remain less than satisfactory. This is especially so for larger perforations (larger than 2 cm). This might account for the failure rates of up to 30–70 per cent in some series,[12] although more recent techniques have appeared more successful.[11]

An alternative surgical approach to the treatment of large perforations woud be to focus on reducing patient symptoms rather than being concerned with the technical success of closure Masing (1965) and Nunez *et al.* (1998) each described a significant improvement in symptoms following partial anterior closure.[9,13]

An alternative method of surgical repair which involves modification of a technique as described in a standard otolaryngology textbook by Jackson and Coates in 1945 is used.[4] This involves enlargement of the septal perforation with repair of its posterior edge. We present a case-series study of patients who underwent the procedure. By comparing the pre-operative and post-operative symptom scores and by reviewing the morbidity associated with this technique we will evaluate the surgical outcome.

Materials and methods

This study was conducted as a retrospective review of patients with septal perforations who underwent the technique of widening of perforation and posterior edge repair between November 1996 and November 1999 at Ninewells Hospital. Alternative methods of repair of septal perforations were excluded from this study.

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Presented at the following meetings (poster presentation): Scottish Otolaryngological Society, Dunblane, June 2000, and BAO HNS Millenium Meeting, Nottingham, September 2000.
Accepted for publication: 23 October 2000.

A questionnaire interview was conducted. The patients were contacted individually by telephone and were interviewed by the same interviewer. Each of them was asked to score a given set of symptoms, using a custom-designed septal perforation symptom score, both pre-operatively and post-operatively. A visual analogue scale of zero to 10 (0 = no symptoms, 10 = extreme symptoms) for the symptoms of epistaxis, crusting, nasal obstruction, nasal discharge, whistling, nasal pain and overall discomfort was used. An objective assessment of the margin of the perforations was carried out at the post-operative review in the clinic (healed *vs* not healed). Documented post-operative complications, length of hospitalization and duration of follow-ups were recorded from clinical notes. All the patients have been discharged at the time of the study and did not require further medical attention for recurrent symptoms.

Operative technique

This technique comprises two main steps. The first involves an enlargement of the perforation while the second stage involves a repair of the posterior edge using local intranasal mucosal flaps. First the nasal septal mucosa is infiltrated with adrenaline 1:100 000 to achieve a dry operative field. A vertical incision is made at the posterior margin of the perforation on both sides of the septum and the mucoperichondral flaps are elevated bilaterally. The septal defect is enlargened by resection of the exposed cartilage from the posterior edge of the perforation with Tilley-Henkels forceps (Figure 2). The mucosal flap on one side is fashioned into superior and inferior pedicles and these are 'wrapped' around the superior and inferior margins of the perforation respectively. The flap on the opposite side is rotated around to 'wrap' the posterior edge of the perforation, thus allowing the posterior edge of the perforation to be covered with a thick layer of mucosa (Figure 3). The flaps are sutured to the residual mucosa using vicryl sutures and a silastic nasal splint is inserted on either side of the septum. These are secured with nylon sutures and are removed after two weeks.

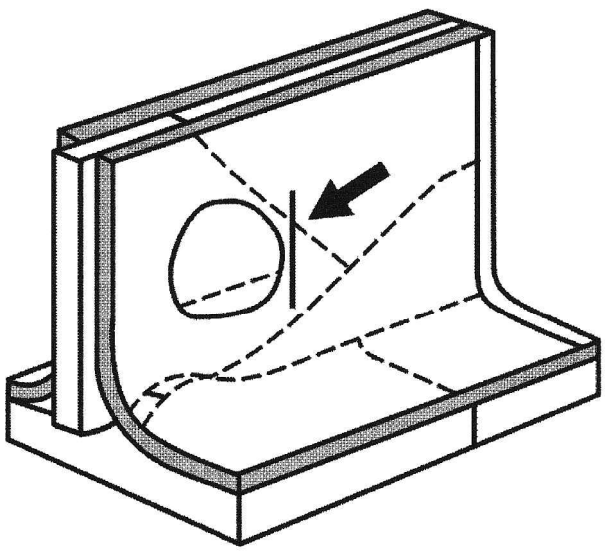


FIG. 1

Septal perforation. The arrow indicates the incision of mucoperichondrium posterior to perforation.

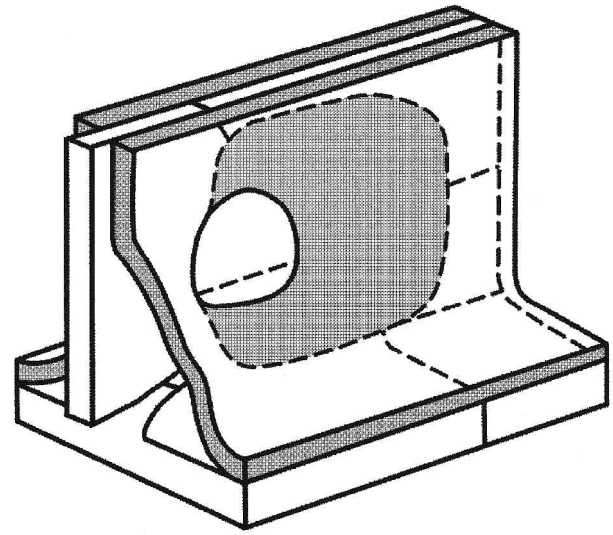


FIG. 2

Bilateral mucoperichondrial flaps are raised. Exposed cartilage from the posterior edge of the perforation is resected.

Results

Between November 1996 and November 1999, 23 patients had surgery for septal perforation at Ninewells Hospital. Ten patients had perforation closure surgery and were excluded from the study. The 13 patients having enlargement and posterior edge repair were reviewed in this study. Their average hospital stay is short, 11 patients were discharged the day following surgery. Post-operative epistaxis

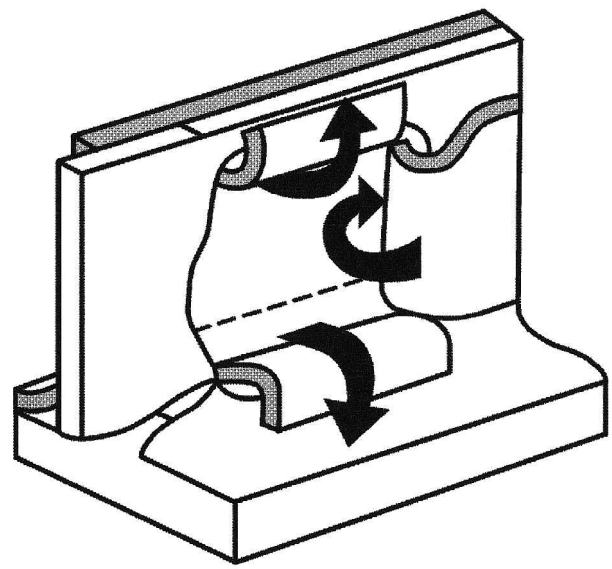


FIG. 3

Fashioning of mucosal flaps. The mucoperichondrium on one side is divided to create a superior and inferior flap. These flaps are the wrapped around the superior and inferior margin of the perforation respectively. On the other side of the septum a mucoperichondrial flap is rotated around the posterior edge of the perforation. The arrows indicate direction of rotation of flaps.

https://doi.org/10.1258/0022215011907172 Published online by Cambridge University Press

delayed discharge in two patients who were subsequently hospitalized for two and 13 days respectively. Of these 13 patients, two patients had died from unrelated disease while three could not be contacted for interview. The remaining eight patients participated in the interview and scored their symptoms according to the visual-analogue scale. The patients' ages ranged from 22 to 79 years (mean age = 45.8 years). There were nine female patients and four male patients. The size of perforations as noted from operative records varied from 15 mm to 50 mm (mean diameter = 30.9 mm).

(1) Symptom scores

Pre-operative symptom score.

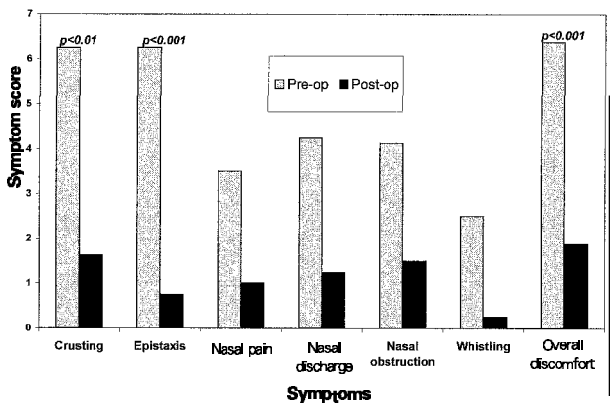
Epistaxis and nasal crusting were noted to be the most significant symptoms, with a mean score of 6.25 each. All eight patients had epistaxis while seven had nasal crusting. Four patients experienced nasal pain, four patients had troublesome nasal discharge and five patients complained of significant nasal obstruction. Only three patients complained of whistling.

Post-operative symptom score.

Of the eight patients who had epistaxis, two had reduced symptoms while the rest were completely asymptomatic. Six of the seven patients who had crusting had improved symptoms. Patients with nasal pain had reduced scores after surgery with one patient being totally asymptomatic. Patients with nasal discharge became less symptomatic with one case being completely resolved. The scores for nasal obstruction were also improved. Of the three cases with whistling, two had complete resolution while the third patient felt less symptomatic. In terms of overall discomfort, all the patients felt a significant improvement after the surgery. Using the mean score of each symptom, the pre- and post-operative values were compared and statistical significance was evaluated using the paired *t*-test. Symptom improvement was significant for nasal crusting ($p<0.01$) and highly significant for epistaxis ($p<0.001$). It was not surprising that statistical significance was not apparent for the remaining symptoms because the numbers affected are small to start with. More importantly, improvement in overall discomfort was noted to be highly significant ($p<0.001$) (Table I).

TABLE I

MEAN PRE-OPERATIVE AND POST-OPERATIVE SYMPTOM SCORES



(2) Objective assessment

On review in the clinic the edge of the perforation was assessed for presence of crusts and granulation tissue. The posterior edge of the perforation was healed in 10 patients. One patient failed to attend for the post-operative review and in two patients the state of the margin of the perforation was not recorded in the clinic notes.

(3) Complications

Post-operative epistaxis was noted in two patients,. One patient experienced slight bleeding within 24 hours after surgery requiring no specific surgical intervention. The other patient required examination under general anaesthesia for post-operative epistaxis. The bleeding site was identified and successfully cauterized with diathermy forceps.

(4) Duration of follow-up

All the patients were initially seen on the second post-operative week for the removal of nasal splints. Subsequent reviews continued until the posterior edge of the repaired perforation was completely healed and the patients were satisfied with the surgical outcome. Of these, 10 patients did not exceed three months of follow-up. Another two patients did not exceed a year while the longest follow-up was a patient who was seen for 20 months post-operatively due to residual symptoms of crusting and epistaxis.

Discussion

This paper reports the technique of surgical treatment of a septal perforation with posterior edge repair. We think it is a useful alternative to the more traditional methods of perforation closure, especially when the perforation is large. Jackson and Coates described perforation enlargement in a textbook in 1945 but this was subsequently considered inappropriate since further reducing normal nasal mucosa was thought to worsen nasal symptoms.[14,15]

The technique described in this study involves the resection of necrotic septal cartilage with preservation of the mucoperichondrial flaps. This allows the residual nasal mucosa to be retained for normal physiology and function. The aim of this study was to evaluate symptom improvement and associated morbidity using this alternative surgical treatment. The improved symptom scores, especially for epistaxis and crusting, demonstrate the benefits of this technique. The procedure is associated with a short hospital stay and minimal morbidity. The obvious limitation of the study is the small number of patients.

https://doi.org/10.1258/0022215011907172 Published online by Cambridge University Press

Conclusion

The closure of large septal perforations is technically difficult to achieve. The surgical goal of procedures to treat septal perforation should perhaps focus on the reduction of symptoms. The study shows that this technique has been effective in achieving the desired outcome. Therefore, this technique can be considered as an alternative to surgical closure methods in the treatment of large septal perforations.

Acknowledgements

We would like to thank Maureen Sneddon (Medical Media Services) for her help in producing the illustrations and Simon Ogsten (Medical Statistics) for his assistance in the statistical evaluation of the data.

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Mr S. P. Eng takes responsibility for the integrity of the content of the paper.
Competing interests: None declared