ORIGINAL CONTRIBUTION

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A randomised prospective trial of trans-septal suturing using a novel device versus nasal packing for septoplasty*

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SUMMARY

Background: *Nasal packing or trans-septal sutures are used to prevent postoperative complications in septoplasty. Trans-septal suturing is not commonly used, since it takes time and is technically difficult with the available devices following septoplasty.*

Methods: *This study included 64 patients who underwent septoplasty. Following septoplasty, the patients were divided into two groups: group 1 had trans-septal sutures placed using a novel device and group 2 had the nose packed with a tampon. The duration of surgery, postoperative symptoms and complications were compared.*

Results: *All of the postoperative symptoms were significantly less in the group with trans-septal sutures. The mean duration of surgery was 34.9 minutes in the nasal packing group and 37.8 minutes in the trans-septal suture group, and the difference was significant ($p = 0.026$). No postoperative bleeding, submucoperichondrial haematomas, infections or abscesses occurred in any of the patients, whilst nasal perforation was observed in one patient in each group. Two (5.4%) patients in group 1 and one (3.7%) patient in group 2 had postoperative adhesions.*

Conclusions: *We have developed a simple, inexpensive device for performing trans-septal suturing that is easy to use in the nasal cavity. We conclude that the use of continuous septal suturing with our device is an easy modification of the standard procedure, with only a small increase in operating time.*

Key words: septoplasty, nasal pack, trans-septal suture

INTRODUCTION

Nasal obstruction is a common problem and frequently requires nasal septum surgery. In this surgery, nasal packing or trans-septal sutures are used to prevent postoperative complications. Nasal packing is preferred by surgeons due to its ease of use and ability to prevent postoperative bleeding. However, nasal packing is uncomfortable for the patient. Trans-septal suturing, which is an alternative to nasal packing, is a well-known procedure. Although trans-septal sutures provide comfort, it is not a common method since it takes a long time and is technically difficult following septoplasty using the available devices. We developed a simple, inexpensive device for performing trans-septal suturing that is easy to use in the nasal cavity.

Here, we report on our early clinical experience with this novel device in patients undergoing transnasal septal suturing after septoplasty.

MATERIALS AND METHODS

Patients and septoplasty

This study was approved by the hospital ethics committee and informed consent was provided by all of the patients before being enrolled in the study. Sixty-four patients with septal deviation that led to airway obstruction were treated with septoplasties. Of these, 41 (64%) were male and 23 (36%) were female. The patients were between 19 and 62 years of age with a mean age of 35.6 years. All patients were operated on under general anaesthesia by one surgeon. A solution of 1/100,000 adrenaline and 1% lidocaine was used for infiltration. The septal cartilage was corrected, either by scoring or wedge excisions. The patients were divided randomly into two groups. The 37 (58%) patients in group 1 had trans-septal sutures placed following the septoplasty. The 27 (42%) patients in group 2 had a preformed tampon (Netcell 5000; Network, Ripon, UK) inserted in the nasal cavities for 48 hours after the septoplasty.

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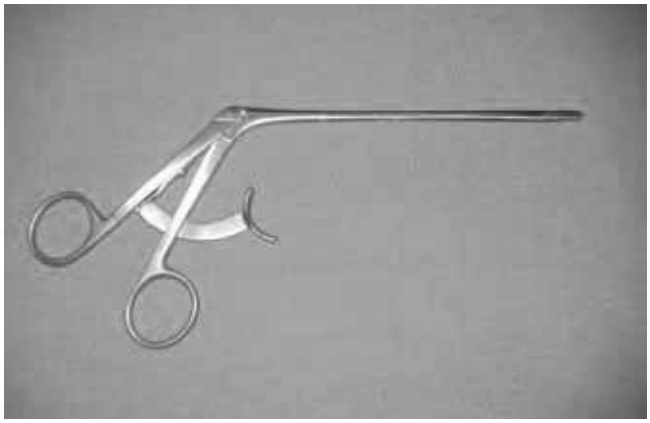

Figure 1. A photograph of our device.

Device

We developed a novel device that helps to insert sutures in the nasal cavity. This new appliance looks like the standard nasal forceps used in endoscopic sinus surgery, with the only difference in the lock of the suture needle being similar to straight mosquito forceps. The device is made from stainless steel. It has 1.3-mm smooth jaws and a working length of 13.5 cm. It has a ratchet handle to keep the needle in the jaws (Figure 1).

Suturing

In group 1, the nasal mucoperichondrium flaps were sutured with 4.0 Vicryl on 13-mm straight needles (Ethicon; Johnson & Johnson, Istanbul, Turkey) using the novel device. Suturing was performed using a nasal speculum and headlight to provide enough exposure. With this technique, the stitches, which were approximately 1 cm apart, were started from the anterior anterocaudal edge of the septum and continued toward the posterior edge. As soon as they reached the posterior edge, the nasal flaps were continued toward the front with multiple random throws, and the remaining dead space was obliterated to prevent bleeding. The sutures were terminated by knotting on the front of the septum at the place where the sutures were initiated.

Postoperative care

Postoperative systemic antibiotics were given in the nasal packing group only for 7 days postoperatively. All patients were evaluated 3, 7, 10 and 14 days and 1 and 3 months postoperatively. Postoperative symptoms and complications were noted.

Statistics

The differences in postoperative symptoms between the two groups were compared using the chi-square test. Student's t-test was used to compare the quantitative data within the groups, as well as the descriptive statistical methods (mean and standard deviation). The results were evaluated with the 95% confidence interval and $p < 0.05$ was considered significant.

RESULTS

All of the postoperative symptoms were significantly less in the group with trans-septal suturing compared to the group with nasal packing. The postoperative complaints of the patients are shown on Table 1. The mean duration of surgery was 34.9 minutes in the nasal packing group and 37.8 minutes in the trans-septal suture group, and the difference was significant ($p = 0.026$).

No postoperative bleeding, submucoperichondrial haematomas, infections or abscesses occurred in any of the patients, whilst nasal perforation occurred in one patient in each group. Two (5.4%) patients in group 1 and one (3.7%) patient in group 2 developed postoperative adhesions. None of the patients in the trans-septal suture group required postoperative nasal packing to treat bleeding. Almost all of the patients in group 1 reported no discomfort. Only nine (24.3%) cases in this group had localised crusting, which persisted for 7 days. The nasal deviation recurred in one (2.7%) patient in group 1 and in two (7.4%) patients in group 2 during the follow-up period. These patients underwent secondary revisions.

DISCUSSION

Septoplasty is one of the surgical procedures performed most frequently by otorhinolaryngologists. Without nasal packing, a septoplasty does not cause discomfort. The advantages of nasal packing following surgery are that it prevents haemorrhage, obliterates the dead space between the cartilage and mucoperichondrial flaps, confers stability and prevents synechia. The disadvantages of nasal packing include the discomfort of breathing through the mouth, headache, dysphagia, disturbed

Table 1. A comparison of the patients' complaints with nasal packing versus trans-septal suturing.

	Trans-septal suturing (group 1, n = 37) n (%)	Nasal packing (group 2, n = 27) n (%)	p*
Headache	11 (29.7)	20 (74.1)	0.001**
Discomfort swallowing	0 (0.0)	18 (66.7)	0.001**
Dry mouth	3 (8.1)	27 (100.0)	0.001**
Disturbed sleep	11 (29.7)	22 (81.5)	0.001**
Increased lacrimation	2 (5.4)	15 (55.6)	0.001**

p-values were determined using the chi-square test.

sleep, reduced middle ear pressure and foreign body reaction or infection; moreover, a greater degree of pain, especially when the packing is removed, can occur as well as total nasal obstruction, which leads to changes in respiratory mechanics and the arterial blood gas tension [1–4]. In addition, one study showed that when Merocel was used, the epithelium of the nasal mucosa was thinner and cilia were lost [5].

Trans-septal sutures are an alternative to nasal packing and are as effective at controlling bleeding as postoperative nasal packing [4]. Many methods of trans-septal suturing have been reported [6,7]. During septum surgery, when septal sutures are used, postoperative nasal tampons or splints are not necessary, which eliminates the pain that occurs when the packing is being removed [4,8]. Simultaneously, the sutures increase the stability of the septum and prevent displacement.

Many studies have found significant arterial hypoxemia in patients with nasal packing [9–12]. Myocardial infarction is a possible complication of nasal packing that can result from a decrease in blood oxygenation and can be prevented by the use of sutures. Therefore, the trans-septal suture is an advantage for patients with cardiac problems and hypertension. Two more reasons exist for using trans-septal sutures. First, trans-septal sutures are preferable for endoscopic sinus operations with septoplasty because nasal packing may lead to narrowing of the middle meatus and synechia formation. Second, in addition to the reported benefits of septal surgery for patients with obstructive sleep apnea syndrome, Regli et al. found a significant increase in the oxygen desaturation of the patients with nasal packing regardless of whether they have obstructive sleep apnea syndrome [13].

In our study, no postoperative bleeding, submucoperichondrial haematoma or abscess formation occurred in either group. Therefore, septal suturing is effective for controlling nasal bleeding after septoplasty. In addition, no difference was detected in the incidence of recurrence of the nasal deviation, septal perforation or postoperative adhesions between the two groups. However, all of the patients in the trans-septal suture group were more comfortable than those in the nasal packing group. Therefore, the effectiveness and safety of this technique in addition to the reduced postoperative morbidity makes it a superior alternative to nasal packing following septal surgery. Unfortunately, septal suturing is not widely used due to technical difficulties. The narrowness of the nasal cavity, especially posteriorly, makes nasal suturing difficult. Since straight mosquito forceps are too big for the nasal cavity, they restrict mobility and visibility. Suturing with straight mosquito forceps may injure the nasal mucosa because of the sharp needle and the lack of visibility. We designed a thin device to enhance the mobility and visibility inside the nose. The forceps that we use in endoscopic sinus surgery gave us the idea. The device is similar to the straight cup forceps that are used in sinus endoscopy; however, the edge that holds the needle is designed like that of conventional straight mosquito forceps and can lock the needle like classic needle holders. Since the device was thin and only the edge of the device was open, it was easy to suture, even in the posterior cavity. It is important to use a straight needle with our device. In this way, the needle passes in and out of the septum at the same level. Based on our experience, using a straight needle is much easier than using a circular needle.

We think that this device can be applied not only for suturing in septoplasties instead of postoperative nasal packing, but also for situations that require suturing in the nasal cavity, such as that of the middle concha to the septum during endoscopic surgery, and repairing septal perforation.

CONCLUSION

Nasal packing is used frequently after septoplasty, primarily to control postoperative nasal bleeding. Trans-septal sutures are an alternative to nasal packing because no difference was seen in the incidence of complications between the suturing and nasal packing groups. In addition, the trans-septal sutures did not need to be removed, and the possible complications of nasal packing, such as possible aspiration, myocardial infarction and toxic shock syndrome, can be prevented by the use of sutures. However, trans-septal suturing is more difficult than nasal packing and is consequently not used routinely in septoplasty. We conclude that the use of continuous septal suturing with our device is an easy modification of the standard procedure, with only a small increase in the operating time. Our device is thinner than conventional straight mosquito forceps, which enables a wide field of view and enhances mobility for suturing the septum, even in the posterior nasal cavity. Use of this device will facilitate not only septoplasties, but also other nasal surgeries that require intranasal sutures.

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