

Evaluation of the Efficacy of Surgery for Treatment of Septal Perforation

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ABSTRACT

Background: The majority of septal perforations are caused by trauma either with or without infection. In most cases trauma is related to the surgery.

Methods: Twenty patients with nasal perforation who underwent surgery from 2008 to 2011 were retrospectively evaluated. Three different surgical approaches were used: bilateral rotational advancement flap of nose floor with fascia through open rhinoplasty, bilateral rotational advancement flap of nose floor with using cartilage through closed method and inferior turbinate rotational flap.

Results: After the surgery, all symptoms disappeared and examinations of healing regions in fifteen patients showed that the perforation was completely healed. In five patients, the perforation size reduced.

Conclusion: Inferior turbinate flap in small perforations would be a logical method with ideal results. In cases with perforation size of one centimeter or larger and in more posterior types, the external method is recommended for a better exposure.

Keywords: Nasal septal perforation, Surgical technique.

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INTRODUCTION

The majority of septal perforations are caused by trauma either with or without infection. In most cases trauma is related to the surgery. It is believed that about 1 % of all septoplasty surgeries lead to septal perforation (1). Septal perforation in one third of all patients can cause symptoms that depend on the region and the size (1). The large and anterior perforations are usually symptomatic while posterior ones are less symptomatic due to the process of nasal turbinate moistening. The major symptoms, which are due to changing in air stream from laminar to turbulent are nasal congestion, frequent nasal scabbing and epistaxis (2). Whistling is the other symptom which happens in minor perforations. A chronic perforation can cause a low-grade infection that leads to osteitis in septal regions and nose floor. To treat the patients with symptoms, at first, preservative treatments such as nasal irrigation and lubricating ointments are prescribed. In case the symptoms are untreated, surgical methods are recommended (1, 2).

PATIENTS and METHODS

Twenty patients with nasal perforation underwent surgery from 2008 to 2011. The characteristic of patients and post-operative information such as age, gender, surgical background, trauma background, connective tissue disease, symptoms and the size of perforation were recorded. Patients surgical information such as , surgical types, problems, difficulties, grafts or flaps were all extracted and their conditions after the surgery were studied as well. Most of the patients were examined through endoscopy after the surgery and the endoscopy results were gathered. The surgical techniques which were used in this research were:

1. Bilateral rotational advancement flap of nose floor with fascia through open rhinoplasty.
2. Bilateral rotational advancement flap of nose floor with using cartilage through closed method.
3. Inferior turbinate rotational flap.

Bilateral rotational advancement flap of nose floor with fascia through open rhinoplasty was done under general anesthesia. Temporalis fascia was harvested with a small incision on the

top of auricle. After injecting Lidocaine 1% and Epinephrine 1/100000 in columella, mucosa in both sides of septum and perforation region, rhinoplasty incision was done and then mucoperichondrium released from both sides of septum and perforation.

The mucoperiosteal flap was released from the nose floor in both sides. We could increase the size of flap through releasing covering mucoperichondrium under upper lateral cartilage. If perforation was large, the nose floor incision which is under the inferior turbinate was necessary for the better movement of mucoperichondrial and mucoperiosteal flap. Subsequently perforation region in each side was stitched with Vicryl suture 4% and temporalis fascia was used for strengthening the healed perforations by putting under mucoperichondrium in both sides. In case of having cartilage, putting it between two layers could make healing region stronger. Finally, the incisions stitched and a piece of film but not a tampon was used as an internal splint. Bilateral rotational advancement flap of nose floor through closed method is like the previous method. The only difference is that here we used internal approach rather than external and after lifting mucoperichondrial flaps, they are stretched toward perforation and for stitching,

RESULTS

In this retrospective research, twenty patients including twelve men and eight women who were suffering from septal perforation were examined. The cause of perforation was previous surgery in eighteen and trauma in two patients. For exclusion of the rest of perforation etiologies, serologic and hematology tests for Wegener, tuberculosis, syphilis was done. Sixteen patients (80%) had nasal congestion, four patients (20%) had frequent epistaxis, two patients (10%) had nasal scabbing and one (5%) had nasal whistling. The diameter of perforation in six patients was less than 5mm, in eight patients it was between 5 and 10 mm and in six patients it was larger than 10 mm.

For perforation healing in eleven patients with open rhinoplasty incision, mucosal flap was used with putting fascia either with or without cartilage between two mucoperiosteal flaps. In one case the perforation size was larger than normal; it required an incision under inferior turbinate to be healed without any problem. In the internal approach, for 4 patients cartilage was used as mid-layer and for the remaining, inferior turbinate flap was used as coverage. In all patients in case

Table 1. Statistical analysis of data

| Surgical result | | Complete healing | Reduction in perforation size | Meaningful level |
|----------------------|--------------------|------------------|-------------------------------|------------------|
| Gender | Male | 7 | 5 | NS |
| | Female | 8 | 0 | |
| Etiology | Surgery | 14 | 4 | NS |
| | Trauma | 1 | 1 | |
| Symptoms | Congestion | 12 | 4 | NS |
| | Frequent Epistaxis | 3 | 1 | |
| | Whistling | 1 | 0 | |
| Perforation Diameter | Less than 5 mm | 6 | 0 | NS |
| | 5mm to 10 mm | 5 | 3 | |
| | More than 10 mm | 4 | 2 | |
| Method | 1 | 7 | 4 | NS |
| | 2 | 3 | 1 | |
| | 3 | 5 | 0 | |

NS: not significant

the flaps were not rotated and just a cartilage was used as midlayer. Inferior turbinate flap can be used to heal the perforation region. After general anesthesia and injection, one side of inferior turbinate flap was lifted with posterior base and after refreshing the edges of perforation, the flap was stitched to the perforation. No splint was used in this method and after three weeks the posterior base flap could be incised.

of nasal septum deviation, septoplasty was simultaneously performed as well. For statistical analysis of data, SPSS software version 20.0 has been used. There was no meaningful connection between variations and surgical results (Table 1). After the surgery, all symptoms disappeared and examinations of healing regions in fifteen patients showed that the perforation was completely healed. In five patients, the perforation size reduced. Fortunately, we did not

find any problem regarding treatment failure, enlarging or stabilizing of perforation size.

DISCUSSION

The reported rate of septal perforation outbreak is about 1%, which is almost one third of symptomatic patients; although it is assumed that this rate is lower (1). Pinpointing the causes of a perforation in patients who undergo the surgery is highly important to attain successful surgical results. Perforations up to four centimeters can be remedied by interior flaps of the nose, although, larger perforations cannot be remedied via endonasal approaches (2, 3). Contraindication for operation exists in patients whose perforation causes cannot be remedied. Concerning dissatisfying results in amending nasal septum perforations, different surgeons have innovated and applied a variety of methods; but despite the various techniques and sufficient studies in this area, a preferred surgical method has not been recommended yet and complimentary researches are still needed in this area. Foda has applied the open rhinoplasty technique in twenty patients to stitch the septal perforation incisions which it was approximately 90% successful in healing the perforations and 80% in curing the symptoms. He used bipediced flap and reductive rhinoplasty to increase the amount of ready flap (5). Newton and his colleagues used bipediced flap and temporalis fascia and found this technique significantly successful (6).

Pedroza et al. have applied both internal and external methods with either temporalis fascia, conchal cartilage and cortical mastoid bones in sixty eight patients. The external method was applied in fourteen patients but it isn't clear on how many of them bipediced flap or bilateral advancement flap was applied. This method has been successful in 97% of the patients, which has been the highest rate ever. All patients, whose perforations were fully healed, have mentioned that the symptoms disappeared but the research has not clarified the symptoms types and how to evaluate them (7). In our study, the applied method in fifteen patients was mucoperichondrial and bipediced mucoperiosteal flap lifting. The preferred technique is mucosal flap since it has physiological mucous structure of a nose. On the other hand, previous studies have showed that a bilateral flap has been more successful than a one-way flap and a bipediced flap is more

acceptable than mono pedicle flap, which is more efficient in supplying blood. The only deficiency of bipediced flap is that it cannot be advanced easily. It is believed that when bipediced flap is used with fascia or mid-cartilage, it can make a surgery more successful in long term (7). Some experts believe that autologous materials are preferred to other materials and cartilage is preferred to fascia since it is firmer (8).

In our research, all patients with small perforations, up to five millimeters, and those who have been healed via the third method, have had complete successful healing. One of the patients in the large perforation group whose perforation size reduction was more than 50 %, was healed completely afterward via the third method after six months but the data is not mentioned in the statistics. Although the most common type of mid-layer is temporalis fascia, healing process in all cases that the fascia was used with cartilage between two flap layers has been completely successful. However, in one of the incomplete healing when fascia was applied alone, the patient faced purulent rhinitis in the first week after surgery and the infection of the healed region might be the reason of failure in this case. According to findings of this study and the previous ones, it can be concluded that the external method with creating a better vision is more efficient in improvement of surgical results. This method can be used in larger perforations or the cases that perforation is lot more posterior. On the other hand, one must be alerted about the potential risks of extensive manipulation of the nose and para nasal sinuses (9). We can trace an algorithm for approaching to symptomatic septal perforations of the nose in order to examine the surgical results. That means applying inferior turbinate flap in small perforations (smaller than 5 millimeters) would be a logical method with ideal results since it uses minimum dissection and is relatively easy and simple to be done. In the large perforations, depending on their size and region the external or internal method is used. In cases with perforation size of one centimeter or larger and in more posterior types, the external method is recommended for a better exposure and due to the great differences in acquired results of this type of perforation healing, using a cartilage and fascia is recommended since they can make the mid-layer firmer and stronger. Also, after the surgery a regular check and local care are

necessary to discover and cure the possible infection promptly.

CONCLUSION

Inferior turbinate flap in small perforations would be a logical method with ideal results. In cases with perforation size of one centimeter or larger and in more posterior types, the external method is recommended for a better exposure.

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