

## INSERTION OF NASAL SEPTAL BUTTON IN THE TREATMENT OF SEPTAL PERFORATION: A CASE REPORT

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## INSERCIJA SEPTALNOG OPTURATORA U TRETMANU PERFORACIJE NOSNE PREGRADE: PRIKAZ SLUČAJA

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### ABSTRACT

Nasal septal perforation etiology varies to a degree, but it is most commonly associated with septal surgery. Penetrant nasal injuries, septal hematoma, nasotracheal intubation, nasal septal abscess, tuberculosis, syphilis, lupus erythematosus, Wegener's granulomatosis, sarcoidosis, etc, as well as neoplasm can result in perforation.

Symptomatic perforations are commonly treated, and one way observe formation of crust layers, obstructions, presence of coloured secretion, paranasal pain, and whistling during inspiration. The first step to be taken is treatment of the basic illness which caused the perforation. If conservative treatment do not yield any beneficial results, the next step is to close the perforation, either by means of surgical or nonsurgical procedures. The surgical treatment represents rather difficult endeavour, and it is associated with various complications and failures. There are cases when the surgical approach is contraindicated either due to the patient's age, his or her general and/or local condition, or due to the patient's refusal to undergo surgical intervention. One of the nonsurgical methods which either temporary or permanently reduces, the symptoms of the nasal septal perforation, is insertion of the nasal septal button or obturator.

We have described the case of a patient with large symptomatic nasal septal perforation, to whom, by applying Kelly and Lee method, we performed the insertion of one-piece silicone nasal septal button under local anesthesia.

The method of the preparation and one-piece nasal septal button insertion, described by Kelly and Lee, represents a simple, quick, easy method which is also quite comfortable for the patient in cases of nonsurgical management of nasal septal perforations.

**Key words:** nasal septum, injuries, prostheses and implants

### INTRODUCTION

The etiology of nasal septal perforations is most commonly associated with septal surgery, especially with previously applied method of submucosal nasal septal resection. Besides, an overdue mucous membrane cauterization in cases of hemorrhage, as well as intranasal cryosurgery may result in perforation. Penetrant nasal injuries, septal hematoma, nasotracheal intubation, nasal septal abscess, tuberculosis, syphilis, lupus erythematosus, Wegener's granulomatosis, sarcoidosis etc, various inhalation irritants like cocaine or occupational exposure to caustic or other industrial substances (especially chromic acid), as well as neoplasm can result in the ulceration of the mucous mem-

### SAŽETAK

Etiologija perforacija nosne pregrade je različita, ali se najčešće vezuje za septalnu hirurgiju. Penetrantne povrede nosa, hematomi septuma, nazotrahealna intubacija, zatim oboljenja poput apscesa nosne pregrade, tuberkuloze, sifilisa, lupusa eritematozusa, Wegenerove granulomatoze, sarkoidoze i dr., kao i različiti inhalatorni iritansi, te neoplazme takođe mogu da dovedu do perforacije.

Leče se uglavnom samo simptomatske perforacije koje se manifestuju stvaranjem krusti, epistaksom, opstrukcijom, prisustvom kolorisanog sekreta, paranasalnog bola, a kada su manje i zviždanjem pri inspiraciji. Prvi korak u tretmanu je lečenje osnovne bolesti koja je dovela do perforacije. Ukoliko konzervativni tretman ne da rezultate, sledeći korak je zatvaranje perforacije bilo hirurškim bilo nehirurškim putem. Hirurško lečenje perforacija je težak zadatak i povezano je sa komplikacijama i neuspesima. U nekim slučajevima hirurški pristup je kontraindikovan bilo zbog godina pacijenta, njegovog opšteg i/ili lokalnog stanja, ili zbog odbijanja pacijenta da se podvrgne hirurškoj intervenciji. Jedna od nehirurških tehnika kojom se u tim slučajevima kao privremeno ili trajno rešenje redukuju simptomi perforacije nosne pregrade je insercija septalnog opturatora.

Prikazali smo slučaj pacijenta sa velikom simptomatskom perforacijom nosne pregrade, kod koga smo metodom po Kelly-ju i Lee-ju učinili inserciju jednodelnog septalnog silikonskog opturatora u lokalnoj anesteziji.

Tehnika pripreme i insercije jednodelnog septalnog opturatora, opisana od strane Kelly-ja i Lee-ja, predstavlja jedan brz, jednostavan, lako izvodljiv i za pacijenta komforan metod, za nehirurško zbrinjavanje perforacija nosne pregrade.

**Ključne reči:** nosni septum, povrede, proteze i implantati

brane and cartilage ischaemia, the final outcome of which is the perforation itself. There is a number of perforations the etiology of which is yet unknown, and therefore are classified as idiopathic.

Nasal septal perforations are the most commonly asymptomatic. These would be the perforations with solid epithelial edges, with no bare cartilage or bone, not large in size, or those which are back localized thus not exposed to the air current effect. The most common symptoms are production of crust layers, epistaxis, obstruction, coloured secretion, paranasal pain, and when less acute whistling while inhaling. There is certain number of patients for whom the above symptoms are not too unpleasant, while, on the



other hand, there are patients which are subject to severe medical hindrances due to the symptoms. Crusting may lead to nasal breathing impediments or to severe fetor.

The surgical treatment represents a rather difficult endeavour, and is associated with various complications and the failure (1), while, on the other hand, the existence of numerous surgical methods only suggests the fact that there are no right ones among the many. Nonsurgical treatment is mainly based on nasal irrigation of the cavities. One of the surgical methods which reduces nasal septal perforation symptoms is insertion of the silicone or acryl nasal septal button or obturator. It diminishes drying of mucous membrane caused by air current passage through the nose (2). The insertion of the button may not always be such a simple procedure, and can sometimes be highly unpleasant for the patient.

We have demonstrated the case of a patient with symptomatic nasal septal perforation, with whom we installed one-piece silicone nasal septal button (figure 1), by the procedure demonstrated by Kelly and Lee (3).



Figure 1. Nasal septal button, silicone (standard shape - 30 mm in diameter).

### THE CASE

A 65-year old patient was admitted at the Otorhinolaryngology Clinic, Clinical Center, Kragujevac, in April 2007, due to the obstructions in the nasal breathing, constant presence of coloured secretion in the nasal cavities, occasional nasal hemorrhage, acute postnasal drainage, the impression of „irregular nasal air passages“, as well as insomnia. Prior to admission to the Clinic, the patient had nasal septal surgical procedure fifteen years ago. The discomfort started immediately upon the surgery and became almost regular and unbearable in the last two or three years. By clinical examination we established the presence of perforation, of an irregular shape, 2 x 2.5 cm in size in the middle third of the nasal septum with crusts on the peripheral edge. By endoscopic nasal examination in the left nasal cavity we diagnosed synechia in the valvular region, as well as in the area of the upper peripheral edge of perforation between the mucous membrane in the medial part of the nasal shell and mucous membrane of the nasal septum 1 cm in length. The presence of tumor process was excluded upon removing the crust from the peripheral area perforation, as well as from its immediate surroundings (figure 2). Laboratory and microbiological tests were normal, and skin prick test to the standard set of inhalatory allergens was negative. The ultrasound examination showed a regular status of maxillary and frontal sinuses. Because of

cardiological and pulmonary problems the patient was diagnosed as highly risky of receiving general anesthesia. Given the above, we decided that the patient was to undergo the synechia resection with radio frequency knife, as well as to be subject to the insertion of silicone nasal septal button in order to close the perforation on the nasal septum.

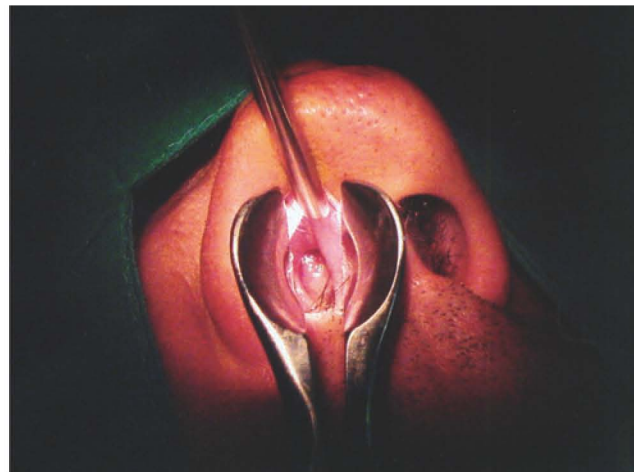


Figure 2. Rhinoscopic view from right nostril. An large septal perforation is visible (findings after crusts removal).

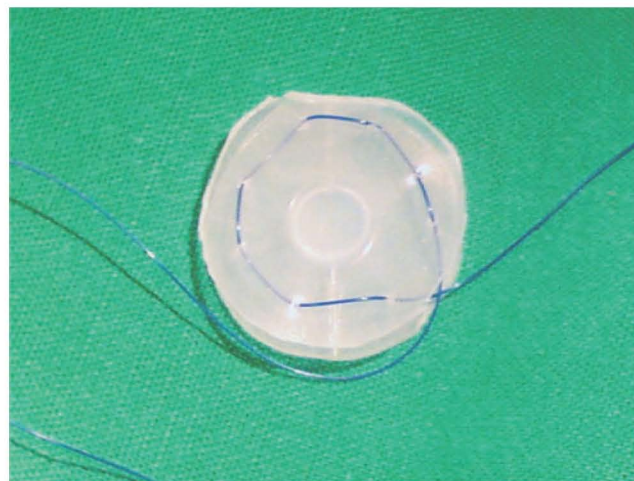


Figure 3. Septal button after modeling and placement of pursestring stitch.

Thirty minutes before the procedure the patient was given 15 mg of midazolam and 0.5 mg of atropine sulfate, i.m. We started with the epimucous anesthesia of both nasal cavities, utilizing four sterile gauze strips (15 cm in length, and 1 cm in width), submerged into 2% solution of tetracaine chloride. Two gauze strips were placed in each of the nasal cavities (one in the upper, and the other in the lower nasal portions). After 10 minutes the gauze strips were removed and the patient continued to receive anesthesia by infiltrating 8 mL of 2% lidocaine chloride. We infiltrated 4 mL of the anesthetic per cavity in the area surrounding synechia and peripheral edge. We subsequently performed the resection of the synechia by applying monopolar radio frequency knife (Dr OPPEL ST-501, Radio Frequency Surgical Unit, Sometech Corporation, USA), which we simultaneously used for hemostasis. The silicone nasal septal button was initially trimmed and



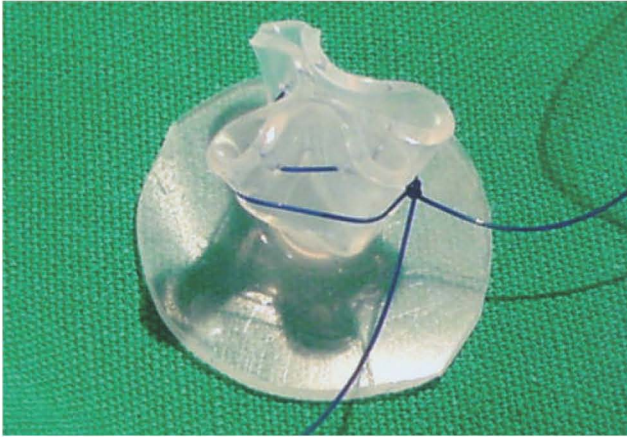


Figure 4. Septal button after the first tie was secured.



Figure 5. Rhinoscopic view from the right nostril. One-piece silicone nasal septal button immediately after insertion.

adjusted according to the perforation shape, and was subsequently prepared for the insertion according to the Kerry and Lee method (figure 3 and 4). The button was easily installed into the perforation (figure 5). The patient underwent the entire procedure quite well, complaining of no pain or any other kind of discomfort, whatsoever. Two gauze strips with antibiotic ointment were placed in the synechia resection region, which were removed two days after the procedure, when the patient was discharged from the hospital.

Postoperatively, providing ambulatory medical care, we treated the sore surfaces of the synechia trinned areas till the process of epithelization was fully completed. The next fourteen days the patient was subjected to everyday inhalation with calcium pantothenate and 0,9% NaCl solution, upon which he was advised to wash the nasal cavities with hypertonic buffered solution (1 L drinking water with 15 mg of salt without of additives and 3–5 mg of baking soda), at least two times a day.

In postoperative monitoring of the patient during the following months, the patient tolerated well the septal button, there were no signs of infection, he had less insomnia, nasal breathing was significantly improved, the nasal secretion was still present, yet to a considerable smaller degree. What caused certain discomfort to the patient was occasional formation of crust layers upon the septal button edge, as consequence of the button edge being ill-placed upon the nasal septum, so that secretion accumulated in the space between the septal button and septum, forming the crust layer.

## DISCUSSION

Majority of the septal perforations are asymptomatic and therefore no treatment is required. The most frequent symptoms are the ones related to the size and position of the perforation (4). With less acute perforations, major symptom is whistling, while with more acute ones the crust layers and hemorrhage prevail. The larger the perforation and the more it is frontally localized, the more acute the symptoms are.

The first step to be taken is treatment of the basic illness, which initially resulted in the perforation. In that way it is possible to achieve natural closure by treating the perforation in a conservative fashion. If the conservative treatment method yields no beneficial results and if the perforation is accompanied with acute symptoms, the next step is to close the perforation by either surgical or nonsurgical procedure (5). There are numerous surgical methods in the treatment of perforations, some of which were less or more successful. There are authors who demonstrated the application of rotational mucosal flap of the lower nasal shell in two-stage procedure (6), those who demonstrated the application of labial-buccal flap (7), or the nasal mucosal flap. Many authors suggest the application of free grafts, either that of nasal shell, concha auricle, tragus auricle or radial forearm fascial free flap, as well as the application of avascular human dermal allograft. The most likely to be successful is application of composite grafts (8). The main issue when discussing the surgical approach are difficulties arising when resolving the perforations in direct correlation with their size. Likewise, surgical failure is more probable in a perforation with large diameter (9). What we should have in mind is the fact that the larger the perforation the less is the surface of the available nasal mucous membrane which is also frail with damaged vessels, therefore unsuitable for any kind of manipulation (10). There are cases when the surgical procedure is contraindicated, either due to the patient's age, his or her overall or local condition, or due to the patient refusal to undergo surgical intervention. In such cases, septal obturator can be applied either as a permanent or as a temporary means of repair. Great number of studies described implantation of nasal septal button from various materials, such as: rubber, acrylate, resin, silicon. The advantages of septal



button insertion would be the following: a relatively simple implantation technique, one-day treatment and local anesthesia in most of the cases. Although the Luff et al. (11) suggested that, despite the symptoms being decreased, nasal septal button is not well tolerated in 50% of the patients. More recent studies found high level of tolerance, with symptoms significantly improved, with no indications of infection or any major local discomfort (12, 13).

We also detected no indications of infection in our patient, as well as no signs of button intolerance, whereby there also occurred a significant symptom improvement. The only complaint he had was related to occasional crust formation in the space between the septal button and nasal septum.

The problem arose most probably due to irregular shape of the perforation and its size, and in-placement of the septal button upon the mucous membrane with secretion and crust formation. With cases like that this would be quite beneficial to utilize custom nasal septal buttons, designed according to the shape of the perforation itself (14, 15).

In conclusion, the method of inserting one piece silicone nasal septal button, as described by Kelly and Lee, is a quick, simple, easily performable and, for the patient, comfortable method, for the nonsurgical management of nasal septum perforations.

## REFERENCES

1. Papay FA, Eliachar I, Risica R, Carroll M. Large septal perforations. Repair using inferior turbinate sliding advancement flap. *Am J Rhinol* 1989; 3: 185–9.
2. McKinstry RE, Johnson JT. Acrylic nasal septal obturators for nasal septal perforations. *Laryngoscope* 1989; 99: 560–3.
3. Kelly G, Lee P. A New Technique for the insertion of a silastic button for septal perforation. *Laryngoscope* 2001; 111: 539–40.
4. Brain D. Septo-rhinoplasty: closure of septal perforation. *Laryngol Otol* 1980; 94: 495–505.
5. Osma U, Cureoglu S, Akbulut N, Meric F, Topcu I. The results of septal button insertion in the management of nasal septal perforation. *Laryngol Otol* 1999; 113: 823–4.
6. Haye R. Septal perforation – prosthetic and surgical treatment. *Rhinology* 1989; 27: 11–5.
7. Tipton JB. Closure of large septal perforations with a labial-buccal flap. *Plast Reconstr Surg* 1970; 46: 514–5.
8. Woolford TJ, Jones NS. Repair of nasal septal perforations using local mucosal flaps and a composite cartilage graft. *J Laryngol Otol* 2001; 115: 22–5.
9. Brain D. The nasal septum. In: Kerr AG, ed: *Scott-Brown's Otolaryngology*. London: Butterworth & Co, 1989: 154–7.
10. Romo T3d, Sclafani AP, Falk AN, Toffel PH. A graduated approach to the repair of nasal septal perforations. *Plast Reconstr Surg* 1999; 103: 66–75.
11. Eliachar I, Mastros NP. Improved nasal septal prosthetic button. *Otolaryngol Head Neck Surg* 1995; 112: 347–9.
12. Price DL, Sherris DA, Kern EB. Computed tomography for constructing custom nasal septal button. *Arch Otolaryngol Head Neck Surg* 2003; 129: 1236–9.
13. Luff DA, Kam A, Bruce IA, Willatt DJ. Nasal septum buttons: symptom scores and satisfaction. *J Laryngol Otol* 2002; 116: 1001–4.
14. Berry S, Brandrick J. Septal perforation – are septal buttons better?: a retrospective analysis. *The Internet Journal of Otorhinolaryngology*, 2005; 4: 1–4. (Accessed in Oct 2007 at <http://www.ispub.com/ostia/index.php?xml-FilePath=journals/ijorl/vol4n1/septal.xml>).
15. Mullace M, Gorini E, Sbrocca M, Artesi L, Mevio N. Management of nasal septal perforation using silicone nasal septal button. *Acta Otorhinolaryngol Ital* 2006; 26: 216–8.

