

# Repair of Nasal Septal Perforation by Using Inferior Turbinate Free Graft

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## ABSTRACT

**Background:** Perforation of nasal Septum is a situation characterized by loss of cartilaginous, bony or both structures of the nasal septum with or without the mucoperichondrium and mucoperiosteum lining. The causes of septal perforations are endonasal surgeries, trauma, infections, neoplasms, inflammation, or abuse of inhaled drugs. The main symptoms are epistaxis, crusting, and whistling, but the majority are asymptomatic.

**Objective:** this study was aimed to assess the effectiveness of inferior turbinate free graft to close nasal septal perforations.

**Patients and Methods:** This is a prospective study, consisted of 20 patients. They were 14 males and 6 females. They had been assessed at the Otolaryngology Department at Al-Diwaniyah Teaching Hospital, Al-Diwaniyah city, Iraq, during the period between January 2017 to January 2019, the age ranges from 20-50 years. Inclusion criteria was symptomatic septal perforation, located at the cartilaginous portion. Exclusion criteria were the presence of underlying infectious, inflammatory, or malignant diseases. The surgery began with hemitransfixion incisions. The perichondral flap is usually raised bilaterally, exposing the entire cartilaginous septum, and refreshing the edge by knife. partial inferior turbinectomy then did. The medial fleshy part of the turbinate is resected, then thinning of the flap on a slide. The flap grasped by forceps and applied through the incision so placed between the cartilage and perichondrial flap covering the defect, then the the perichondrial flap replaced back to its position. incisions sutured, silastic sheets applied to cover the whole septum, and merocele nasal Packing inserted for haemostasis. patient discharged and seen again in the next day for removal of Packing and cleaning. The silastic sheets removed after 8 days. The patients seen twice monthly for follow-up.

**Results:** Complete closure of perforation was obtained in 16 patients (80%). Incomplete closure occurred in 2 patients (10%). Failure of closure (persistent perforation) occurred in 2 patients (10%). Improvement of nasal symptoms achieved in all patients with complete closure, patients with incomplete closure did not show significant problems due to the perforation. patients with persistent perforation had no improvement in their symptoms.

**Conclusion:** Inferior turbinate free graft through the endonasal approach, is useful to close small and medium-sized septal perforations with minimal morbidity and short operative time.

**Keywords:** nasal Septal perforation; inferior turbinate free graft; perichondrial flap

## INTRODUCTION

perforation of nasal Septum is a situation characterized by loss of cartilaginous, bony or both structures of the nasal septum with or without the mucoperichondrium and mucoperiosteum lining. The prevalence of the condition is 1%. The presentation ranges from absence of symptoms to the troublesome nasal symptoms<sup>(2)</sup>. The majority located in the anterior quadrilateral cartilage of the nasal septum<sup>(3)</sup>. The primary causes of septal perforations are endonasal surgeries, but nasal traumatic conditions as repeated picking of nose, septal cauterization, nasal packing for epistaxis, foreign bodies, and hematoma or abscess of septum are also common. Other causes are: infections like Tuberculosis and Lepromatous leprosy, tumours as Adenocarcinoma, inflammation as Relapsing polychondritis, and chemical irritation like addiction of Cocaine, Decongestant nasal sprays, Intra-nasal corticosteroids<sup>(4)</sup> <sup>(5)</sup>. The main symptoms related to septal perforations are epistaxis, crusts, and whistling sound on breathing. Less common symptoms are, dryness or nasal emptiness or discomfort<sup>(3)</sup>, but the major e proportion is asymptomatic<sup>(6)</sup>. Position and size of the hole had a direct relation to the symptoms. Perforation in which the anterior border is located anterior to the nasal valve area and large perforation are the most symptomatic. This may be related to the decrease mucociliary clearance and humidity in the

anterior part of the nose, and the mucosal loss, all responsible for dryness and crusts formation<sup>(7)</sup>. Crusts accumulation around the borders of the perforation causes a feeling of obstruction. In large perforations, patients may develop sensation of empty or obstructed n nose, despite normal or more than normal nasal airflow. Very large perforations result in a large common nasal cavity causing rhinolalia<sup>(5)</sup>. Inflammation in the margin of perforation cause recurrent attacks of epistaxis, which occur with crust removal. Epistaxis commonly originate from the sphenopalatine vascular plexus. Area of mucosal loss, especially with cartilage exposure, interfere with secretions clearance, causing localized inflammation. The nasal inflammation in produce discomfort sensation. With time, cartilage necrosis will result in defect enlargement and so-called active perforation, huge size perforation makes surgical closure very difficult<sup>(3)</sup>.

## PATIENTS AND METHODS

This is a prospective study, consisted of 20 patients. They were 14 males and 6 females. They had been assessed at the Otolaryngology Department in Al-Diwaniyah Teaching Hospital, Al-Diwaniyah city, Iraq, during the period between January 2017 to January 2019, the age ranges from 20-50 years. Inclusion criteria was symptomatic septal perforation, located at the cartilaginous portion. Exclusion criteria were the presence of underlying infectious, inflammatory, or

malignant diseases. Nasal assessment starts by examination external nose. Topical nasal decongestants were applied. Anterior endoscopic rhinoscopy with a 0° telescope used for examination and measurement of dimensions of the perforation. Septal perforations can classify according to site to: anterior cartilaginous, bony cartilaginous or intermediate and bony or posterior. According to size it can classified as: small (< 10 mm in diameter), medium (10-20mm) and large (> 20 mm) <sup>(8,9,10)</sup>. Also looking for cru stations and abnormalities of mucosal structure. Palpation of the septum was done with a cotton-tipped probe to check the abnormalities of the remaining septal cartilage. After examination any patient with suspicious area send for biopsy to exclude tumors or specific infectious diseases. If the patient had no history of nasal surgery or trauma, we send the patient for rheumatological evaluation to exclude chronic inflammatory diseases. The perforation size ranged from 5 to 10 mm. All patients met eligibility criteria and agreed to participate give signed informed consent. The mean postoperative duration of follow-up was 12 months.

### SURGICAL PROCEDURE

The surgery was performed under general anesthesia. Topical nasal decongestants were applied. We infiltrate the septal mucosa with 1% lidocaine with 1:100,000 epinephrine. The approach to the surgery started with hemitransfixion incision, this is a vertical incision in the

vestibular skin of one side of the caudal border of the septum. It is done with the skin retracted using a self-retaining speculum. The incision extends from the anterior septal angle right down to the nasal spine. The perichondral flap is usually raised bilaterally, exposing the entire cartilaginous septum, the flap elevated around the edges of perforation and refreshing the edge by knife. Partial inferior turbinectomy then did, the inferior turbinate is first **infractured**, using a Hill's elevator. A straight artery clip is placed along the length of the turbinate and then closed in order to crush the mucosa. The resected turbinate is then removed by grasping it with of forceps. Only the medial fleshy part of the turbinate is resected, then it grasped by forceps and the inner edge opened by knife to make a flap, then thinning of the flap on a slide continued to be just about 2 to 3 mm. The flap grasped by forceps and applied through the incision so placed between the cartilage and perichondrial flap covering the defect, then the perichondrial flap replaced back to its position. hemitransfixion incisions sutured, silastic sheets applied to cover the whole septum, and merocele nasal Packing inserted for haemostasis. Patient discharged at the same day, and seen again in the next day for removal of nasal Packing and cleaning. The silastic sheets removed after 8 days. The patients seen twice monthly for follow-up. The mean postoperative duration of follow-up was 12 months.



### RESULTS

The demographic characteristics of those 20 patients are shown in table 1.

Table 1: demographic characteristics of the study population

age	male	female	total
20-30	2	1	3
31-40	5	1	6
41-50	7	4	11
total	14	6	20

The symptoms were nasal obstruction (10 patients), recurrent epistaxis (4 patients), crusts (3 patients) whistling noise (2 patients), and headache (1 patient). This shown in table 2and represented in figure 1.

Table 2: Septal perforation related symptoms

symptoms	Patients (%)
nasal obstruction	10 (50%)
recurrent epistaxis	4 (20%)
crusting	3 (15%)
whistling	2 (10%)
headache	1 (5%)
total	20 (100%)

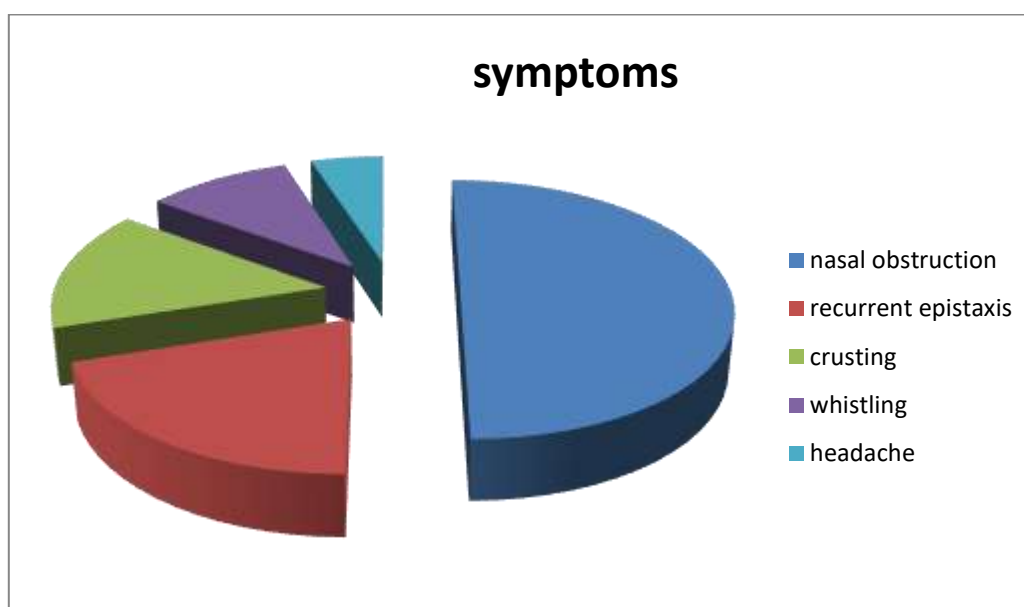


Figure 1: Septal perforation related symptoms

The reported causes of septal perforations were: previous surgery in 13 patients (65%), nasal packing in 1 patient (5%), cauterization for epistaxis in 2 patients (10%), nasogastric tube placement in 1 patient (5%), septal haematoma in 2 patients (10%), and foreign body in the nose in 1 patient (5%). This is shown in table 3, represented in figure 2.

Table 3: reported causes of septal perforation

causes	Patients (%)
previous surgery	13(65%)
nasal packing	1(5%)
cauterization	2(10%)
nasogastric tube placement	1(5%)
septal haematoma	2(10%)
forign body in the nose	1(5%)
total	20(100%)

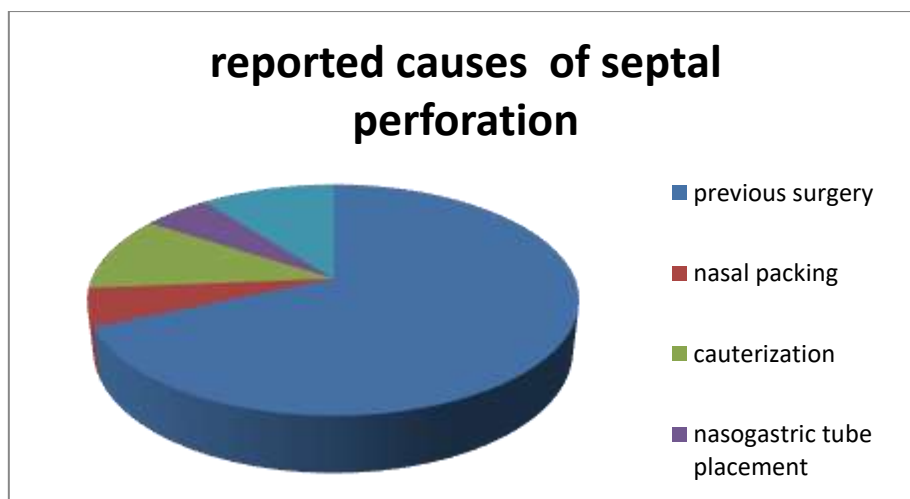


Figure 2: reported causes of septal perforation.

Complete closure of perforation was achieved in 16 patients (80%). incomplete closure occurred in 2 patients (10%) in which small perforation about 2-3 mm was present, failure

of closure (persistent perforation) occurred in 2 patients (10%). This represented in figure 3.

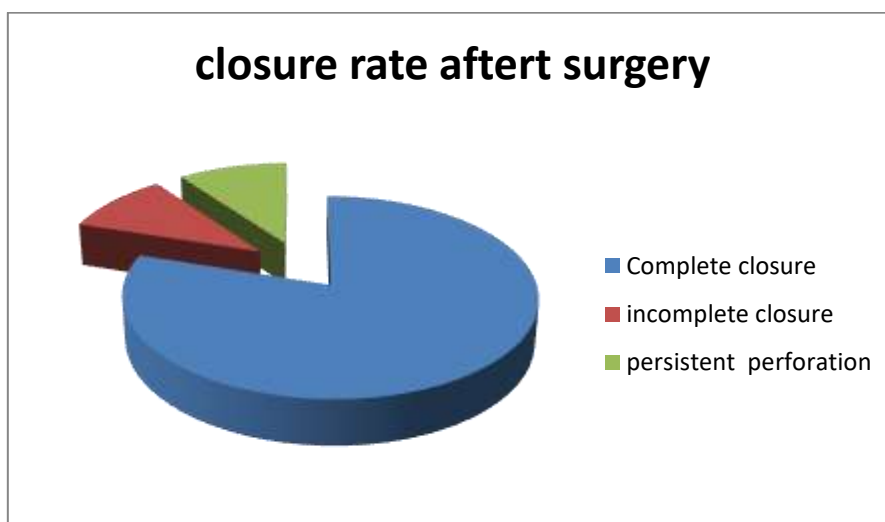


Figure 3: closure rate after surgery.

Improvement of nasal symptoms achieved in all patients with Complete closure, patients with incomplete closure did not show significant problems. patients with failure of closure (persistent perforation) had no improvement in their symptoms.

## DISCUSSION

Septal perforations are mainly incidental finding during nasal examination of asymptomatic patients <sup>(11)</sup>. In our study, the main presenting symptom were nasal obstruction (50%). similar results seen by Hye-Ryung Lee (2015) in which nasal obstruction was the main presenting symptom in 85.7%<sup>(11)</sup>. In our study, the commonest etiology was previous septal surgery (65%). Similar results seen by Kridel RWH (2018) in which previous Septorhinoplasty (35.4%) and septoplasty (24.1%) were the commonest causes <sup>(12)</sup>. Hye-Ryung Lee (2015) showed that septoplasty was the commonest cause (85.8%)<sup>(11)</sup>. If the mucoperichondrium is damaged bilaterally exposing the septal cartilage, then the

septum loses its blood supply resulting in cartilage necrosis and perforation developed<sup>(13)</sup>. Conservative treatment with saline nasal douche, application of lubricating ointments, or use prosthetic material is the primary management. Symptomatic septal perforations which not improved with topical management usually need surgical treatment. Selection of technique of the repair depends on features of perforation and experience of surgeon<sup>(2)</sup>. Foda (1999) <sup>(14)</sup>, said that the main goal in septal perforation surgery is to repair the defect and to restore the normal anatomy and function of nose. Septal perforations can be a challenging defect, and repair limited by availability of surrounding tissue and the perforation size <sup>(15)</sup>. The presence of adequate mucosa above and below a perforation is important for the perforation closure<sup>(12)</sup>. Many approaches was suggested for repair; but, no one is universally accepted<sup>(4)</sup>. These approaches include:

1- The open rhinoplasty approach with an external columellar incision. It provide good exposure of the septal structure, but can leaves external scar<sup>(16,17)</sup>.

2-The midfacial degloving approach, it provide good exposure, and useful for large size perforations, but it is an aggressive approach<sup>(18)</sup>.

3-The endonasal approach. Also used by other surgeons<sup>(13, 19, 20)</sup>.

In current study, we use endonasal approach with hemitransfixion incision. The advantages of endonasal approaches are minimal invasiveness with no external scars, good exposure of the operative field with good visualization of septal structures and good control of perforation margins. The disadvantages are that it is time-consuming and sometimes difficult to perform<sup>(11,21)</sup>. hemitransfixion incision was practical and resulted in complete closure of septal defects in majority of cases ,and can avoid obvious external scars<sup>(11,22,23)</sup>.The closure success rate In our study was 80% .similar results seen by Mansour in 2011<sup>(24)</sup> in which closure rate was 83%,and Tastan E<sup>(25)</sup> in 2012 in which closure rate was 88.8%.

## CONCLUSION

Inferior turbinate free graft through the endonasal approach, is useful to close small and medium-sized septal perforations with minimal morbidity and short operative time.

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