



# A comparative study on nasal packing after septoplasty: does it matter in terms of patient comfort, bleeding, and crust or synechia formation?

Septoplasti sonrası burun içi tamponların karşılaştırmalı çalışması:  
Hastanın konforu, kanama ve kabuk veya şinesi oluşumu açısından önem arz eder mi?

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## ABSTRACT

**Objectives:** This study aims to compare pain, bleeding, nasal obstruction, crust and synechia formation, and anesthesia-related morbidity in patients with and without use of nasal packs after septoplasty.

**Patients and Methods:** A total of 66 patients (32 women, 34 men; mean age 24 years; range 18 to 48 years) who underwent Cottle's septoplasty under general anesthesia were randomly allocated to three groups in this prospective cohort. Telfa nasal packs were used in sutures + telfa group (n=22) and Merocell nasal packs in merocel alone group (n=22). No packs were administered in sutures alone group (n=22). Three groups were compared in terms of nasal obstruction, bleeding, pain, crust and synechia formation, as well as the amount of secretion, the need for oropharyngeal airway, the presence of laryngospasm, and effort for nasal breathing after anesthesia.

**Results:** The amount of bleeding was higher with lower degree of nasal obstruction in sutures alone group. Pain and secretion were more remarkable in merocel alone group. After the first week, these differences were unable to be differentiated among the groups. There were no differences between three groups with respect to crust and synechia formation two weeks after septal surgery.

**Conclusion:** Nasal packs can be more useful in patients who suffer from bleeding-related morbidity, while septoplasty applied without nasal packs can be more suitable in patients with obstructive sleep apnea. The use of nasal packs in septoplasty should be determined on an individualized basis with respect to the characteristics of each patient.

**Keywords:** Bleeding; merocell; nasal obstruction; nasal pack; pain; septoplasty; telfa.

## ÖZ

**Amaç:** Bu çalışmada septoplasti sonrası burun içi tampon kullanılan ve kullanılmayan hastalarda ağrı, kanama, burun tıkanıklığı, kabuk ve sineşi oluşumu ve anesteziye bağlı morbidite karşılaştırıldı.

**Hastalar ve Yöntemler:** Bu prospektif kohortta genel anestezi altında Cottle septoplastisi yapılan toplam 66 hasta, (32 kadın, 34 erkek; ort. yaş 24 yıl; dağılım 18-48 yıl) rastgele üç gruba ayrıldı. Dikişli + telfa grup (n=22) telfa burun içi tamponlar ve yalnız merocel grupta (n=22) merocell burun içi tamponlar kullanıldı. Dikişsiz grupta ise (n=22) tampon kullanılmadı. Üç grup anestezi sonrası burun tıkanıklığı, kanama, ağrı, kabuk ve sineşi oluşumunun yanı sıra, sekresyon miktarı, orofarengeal hava yolu gereksinimi, larengospazm varlığı ve burundan nefes alabilme açısından karşılaştırıldı.

**Bulgular:** Dikişsiz grupta kanama miktarı daha fazla ve burun tıkanıklığı derecesi daha düşüktü. Ağrı ve sekresyon yalnız merocel grupta daha belirgindi. Birinci haftadan sonra, gruplar arasındaki bu farklılıklar belirsizleşti. Septal cerrahiden iki hafta sonra kabuk ve sineşi oluşumu açısından üç grup arasında bir fark gözlenmedi.

**Sonuç:** Kanamaya bağlı morbiditesi olan hastalarda burun içi tamponlar daha kullanışlı olurken, tıkayıcı uyku apnesi olan hastalarda burun içi tampon kullanılmadan uygulanan septoplasti daha uygun olabilir. Septoplastide burun içi tamponların kullanımı, hastaların özellikleri göz önünde bulundurularak, her hastaya göre belirlenmelidir.

**Anahtar Sözcükler:** Kanama; merocell; burun tıkanıklığı; burun içi tampon; ağrı; septoplasti; telfa.



Nasal packs have been commonly used after many nasal surgical procedures especially in septoplasty. Nasal packs apply pressure, fill the preformed spaces, provide support for the cartilaginous or bony framework, maintain moist environments to enhance physiological processes, serve as a barrier and induce physiological hemostatic and reparative processes.<sup>[1]</sup> For this purpose, various products have been manufactured using different materials.<sup>[2]</sup>

Patients frequently complain that the removal of nasal packs after nasal surgery is the most troublesome part of the surgical experience. This circumstance led to the search for a more comfortable nasal pack.<sup>[3]</sup> Ideally, a nasal pack should support the operated structures, effectively prevent bleeding while it is in nasal cavity and be easily removed. Moreover, patients expect to have a comfortable nasal pack that can readily be removed without pain.<sup>[1,4]</sup> Therefore, some companies produce nasal packs from different materials and different shapes to provide comfort for both surgeon and patient. Investigations have focused on packs that will dissolve spontaneously and will not necessitate removal. On the other hand, transseptal suturing techniques have been developed in septoplasty as an alternative to packing.<sup>[5]</sup> Transseptal suturing techniques also have complication risks such as hematoma formation, bothersome blood oozing and nasal obstruction with blood clots. Additionally, blood clots in the nose may give rise to adhesion formation or nausea and vomiting due to swallowing of oozing blood. Moreover, insertion of nasal packs after a certain period following surgery can be more tedious compared to application just after surgical procedure.<sup>[1]</sup>

Despite the discomfort experienced by the patient with nasal packs inside the nose, nasal packs cannot be thoroughly omitted owing to a certain amount of bleeding that inevitably occurs after surgery.<sup>[2]</sup>

There is no consensus on the preferred ideal material, the length of time for keeping the packs inside the nasal cavity and indications for nasal packing. The objective of the present study was to evaluate and compare bleeding, pain, crust or synechia formation, nasal obstruction and anesthesia related morbidity in patients with and without use of nasal packs after septoplasty.

## PATIENTS AND METHODS

The study was designed as a prospective clinical trial and was conducted in the Department of Otorhinolaryngology at Baskent University Hospital, in Ankara, and İstanbul Research and Training Hospital of Baskent University, in İstanbul, Turkey.

Seventy-six patients with nasal obstruction due to septal deviation and concomitant hypertrophied inferior turbinates were included in the study. The study protocol was approved by the Research Ethical Committee of Başkent University (KA15/319), and written informed consent was obtained from all patients. The study was conducted in accordance with the principles of the Declaration of Helsinki. Ten patients who had middle turbinate or paranasal sinus pathologies requiring surgical intervention, history of previous nasal (septum, turbinate, polyp, tumor, or chronic sinusitis) surgery, mucosal disease such as allergic or vasomotor rhinitis, chronic medical illnesses and bleeding tendency were excluded.

Sixty-six patients (34 males, 32 females; average age 24, range 18 to 48) diagnosed with septal deviation underwent Cottle technique septoplasty under general anesthesia by the same surgical team. All patients underwent a septoplasty and radiofrequency ablation of both inferior turbinates. After topical decongestion with 0.05% oxymetazoline, the septum was infiltrated with 1% lidocaine with 1/100,000 epinephrine. The septoplasty was done with the Cottle technique, and mucoperichondrial flaps were fixated. The patients were divided into three groups. In the sutures + telfa group (n=22), transseptal sutures and nasal packs formed from Telfa pad (Medtronic, Dublin, Ireland), in the merocel alone group (n=22), Merocel (Medtronic, Dublin, Ireland) nasal packs, and in the sutures alone group (n=22) only transseptal sutures were placed at the end of the procedure. Patients for the three groups were randomly determined using a computer program.

Telfa nasal packs were maintained in place for 24 hours, while Merocel nasal packs were removed 48 hours after surgery.

Pain experienced by the patient was evaluated with a visual analog scale (VAS) postoperatively at 24 hours, at the first week and first month.

**Table 1.** Comparative overview of bleeding, pain, nasal obstruction, crusting, synechia formation and anesthesia related morbidity in three groups after septoplasty

Variable	Intensity	Sutures + telfa group		Merocel alone group		Sutures alone group		p
		n	%	n	%	n	%	
Duration of stay in recovery room after surgery	Normal	22	100	19	86.4	22	100	} 0.040*
	Prolonged	0	0	3	13.6	0	0	
Bleeding at first week	No	16	78.7	12	54.5	14	63.6	} 0.072
	Mild	2	9.1	8	36.4	8	36.4	
	Moderate	0	0	0	0	0	0	
	Severe	4	18.2	2	9.1	0	0	
Pain at first week	No	21	95.5	19		21	95.5	} 0.123
	Mild	0	0	3		0	0	
	Moderate	1	4.5	0	0	1	4.5	
	Severe	0	0	0		0		
Bleeding at first month	No	20	90.9	22	100	22	100	} 0.377
	Mild	1	4.5	0	0	0	0	
	Moderate	0	0	0	0	0	0	
	Severe	1	4.5	0	0	0	0	
Nasal obstruction at first month	No	10	45.5	13	59.1	11	50	} 0.933
	Mild	8	36.4	5	22.7	5	22.7	
	Moderate	3	13.6	3	13.6	5	22.7	
	Severe	1	4.5	1	4.5	1	4.5	
Pain at first month	No	22	100	22	100	22	100	} -
	Mild	0	0	0	0	0	0	
	Moderate	0	0	0	0	0	0	
	Severe	0	0	0	0	0	0	
Duration of bleeding after removal of nasal pack	No	14	63.6	7	31.8	22	100	} <0.001*
	Mild	6	27.3	10	45.5	0	0	
	Moderate	2	9.1	5	22.7	0	0	
	Severe	0	0	0	0	0	0	
Crusting or synechia formation	No	16	72.7	16	72.7	17	77.3	} 0.885
	Yes	6	27.3	6	27.3	5	22.7	
Difficulty at extubation	No	17	77.3	14	63.6	21	95.5	} 0.030*
	Yes	5	22.7	8	36.4	1	4.5	
Laryngospasm	No	20	90.9	19	86.4	22	100	} 0.207
	Yes	2	9.1	3	13.6	0	0	
Need for oropharyngeal airway	No	10	45.4	8	36.4	15	68.2	} 0.070
	Yes	12	54.6	14	63.6	7	31.8	
Effort for nasal respiration at awakening	No	3	13.6	3	13.6	15	68.2	} <0.001*
	Yes	19	86.4	19	86.4	7	31.8	

\* Statistically significant.

Similarly, the degree of nasal obstruction and bleeding after removal of nasal packs were noted using VAS at the same periods. The amount of blood oozing out of the nose at 24-48 hours was quantitatively measured as number of bolsters placed in front of nostrils that needed to be replaced. Duration of bleeding after removal of packs was observed and graded as less than

60 seconds, between 60 and 120 seconds and greater than 120 seconds.

The evaluation of the nasal cavity in terms of crusting and synechia formation was made by using rigid or flexible endoscopic examination and was termed as either "absent" or "present". Anesthesia related parameters such as duration of stay in recovery room, intensity of secretion,

presence of laryngospasm after surgery, need for oropharyngeal airway and effort for nasal respiration were noted.

### Statistical analysis

Data was analyzed using IBM SPSS version 20.0 software (IBM Corporation, Armonk, NY, USA). Since quantitative variables were categorical, non-parametric tests were used. Independent groups were compared with Kruskal Wallis test and Mann-Whitney U test was utilized if there was a significant difference between groups. Categorical variables were compared by Pearson chi-square test. Quantitative variables were expressed as median and interquartile range. Confidence interval was set at 95% and level of significance was determined as p value less than 0.05.

## RESULTS

A comparative overview of perioperative and postoperative parameters under investigation in three groups is displayed in Table 1. There were noteworthy differences between the three groups with respect to bleeding, nasal obstruction and pain and amount of secretion at 24 hours postoperatively. However, no differences could be detected between the three groups in terms of nasal obstruction at the first week.

In terms of bleeding 24 hours postoperatively, the lowest score was detected in merocel alone group, while sutures alone group exhibited the highest score ( $p < 0.001$ ). The amount of bleeding in the three groups at the first week, first month and just after removal of nasal packs is shown in Figure 1.

Nasal obstruction was least obvious in sutures alone group at 24 hours postoperatively ( $p < 0.001$ ). There was no difference between sutures + telfa group and merocel alone group. The degree of nasal obstruction in the three groups at the first month after septoplasty is presented in Figure 2.

Pain was most remarkably reported by patients in merocel alone group ( $p < 0.001$ ), whereas sutures + telfa group and sutures alone group did not differ with respect to pain on the first day after surgery. The severity of pain in the first postoperative week is demonstrated in Figure 3.

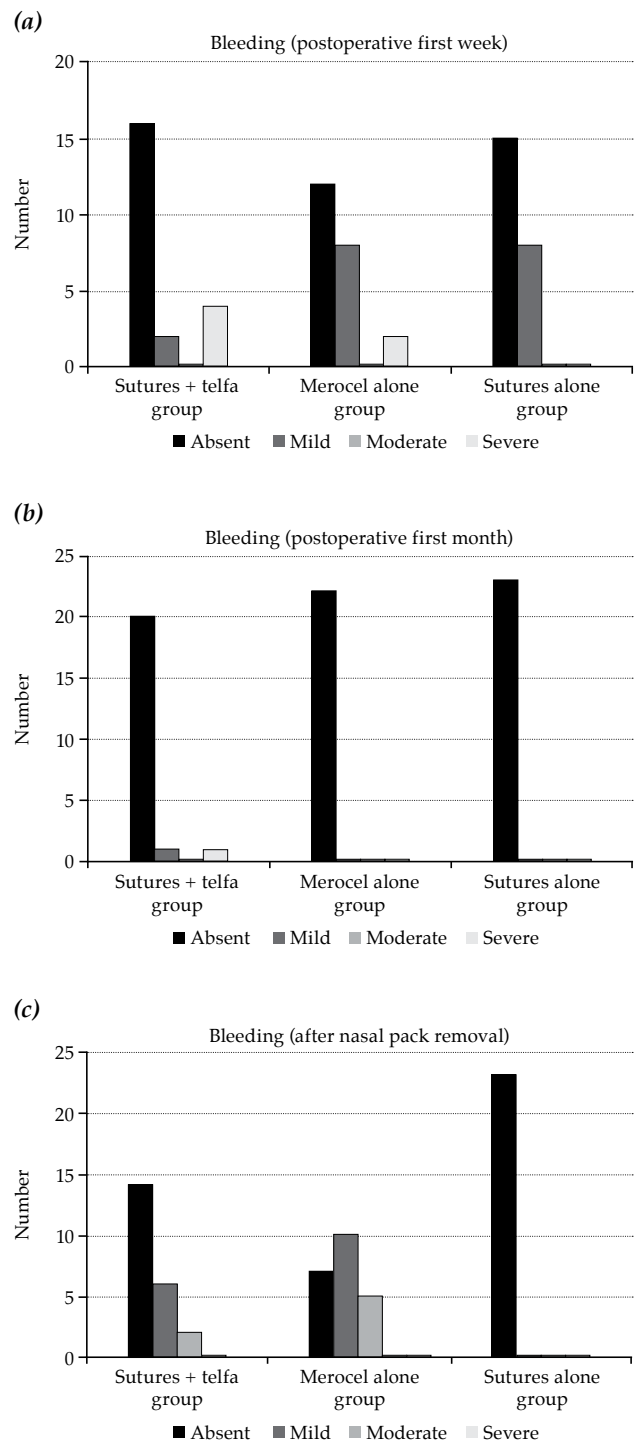


Figure 1. Comparison of amount of bleeding at the (a) first week; (b) first month; (c) just after removal of nasal packs, in three groups following septoplasty.

Secretions on waking up from anesthesia were most obvious in merocel alone group ( $p < 0.001$ ), but the two other groups did not exhibit any differences. There was no difference between

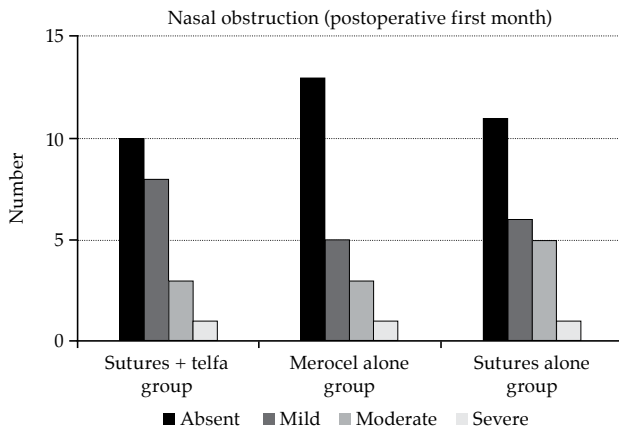


Figure 2. Degree of nasal obstruction in three groups in the first month after surgery.

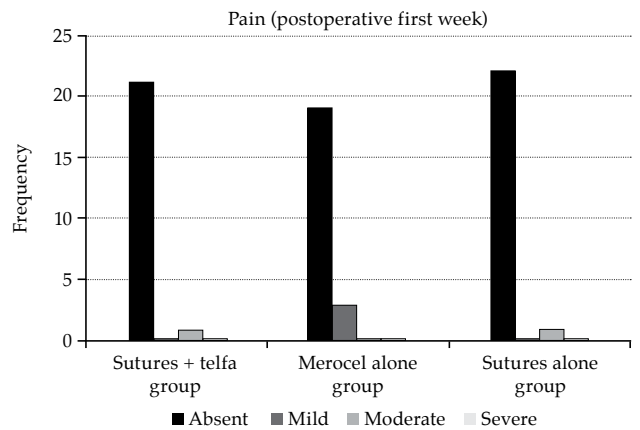


Figure 3. Severity of pain reported by patients in three groups at the first week postoperatively.

groups in terms of effort for nasal respiration on awakening, synechia formation and crust formation.

### DISCUSSION

Postoperative care after septoplasty is important to achieve the best therapeutic outcome and to minimize patient discomfort. From this point of view, the decision to pack the nose or not is an important aspect. While packing the nose offers the advantage of hemostasis and providing support for the nasal framework, it may result in considerable discomfort. In addition, removal of the nasal pack can be a painful and troublesome experience.<sup>[2,6]</sup> Some authors reported that nasal packing can be avoided in the majority of cases but meticulous cleansing of blood oozing into the nasal cavity is essential.<sup>[7]</sup> Efforts have been spent on developing nasal packs that are more comfortable and can be removed readily.<sup>[2]</sup>

The literature contains varying information about the use of nasal packing in septoplasty. Some studies revealed no difference in bleeding or septal hematoma formation if different packing materials are used or if no packing is used.<sup>[8-11]</sup> On the other hand some studies highlighted the importance of nasal packing.<sup>[12]</sup>

A trial comparing the efficacy of nasal packs subsequent to septal or turbinate surgery suggested that packing with paraffin gauze or Telfa resulted in less discomfort and bleeding compared to Merocel.<sup>[13]</sup> They advocated the use of Telfa since packing with paraffin gauze could result in granuloma formation.<sup>[13]</sup> Watson et al.<sup>[14]</sup>

reported that insertion of a pneumatic balloon caused a more remarkable accumulation of debris, formation of adhesion and nasal obstruction. They suggested that mucosal ischemia due to application of overt pressure by the balloon was responsible for these hazardous outcomes.<sup>[8]</sup> A nasal pack with a ventilation tube is supposed to increase patient comfort by allowing passage of air through the nose. However, Illum et al.<sup>[15]</sup> demonstrated that the benefit from a Merocel nasal pack with a ventilation tube was slight and bleeding after removal was more remarkable. This finding was attributed to the adherence of nasal pack to the mucosa permitting in-growth of granulation tissue. Lemmens and Lemkens<sup>[8]</sup> applied the suturing technique to 226 patients. In a study on sheep, Shaw et al.<sup>[16]</sup> 18 showed that nasal packing caused a 50-68% loss of mucosa cilia. von Schoenberg<sup>[17]</sup> found that septal surgery with Telfa was more painful than no packing. They proposed that nasal packing is unjustified and Telfa<sup>®</sup> should be used if it is to be applied. In another publication, Merocel<sup>®</sup> was associated with more discomfort and more bleeding in comparison to Surgicel<sup>®</sup> (oxidized regenerated cellulose).<sup>[18]</sup> In another recent trial, Cruise et al.<sup>[1]</sup> concluded that Telfa was linked with less crusting than Rapid Rhino<sup>®</sup>.

The current study was performed to evaluate the efficacies of nasal packs after septoplasty and to compare pain, bleeding, nasal obstruction, crust or synechia formation, and anesthesia related morbidity in patients operated with and without use of nasal packs. Our results suggest that Telfa nasal packs in combination with septal

suture provides more satisfactory outcomes in terms of pain, bleeding and nasal obstruction compared to Merocel. Surgery without nasal packing can be preferred if bleeding is less likely to occur after the procedure. Differences between groups in terms of bleeding, pain or nasal obstruction did not extend beyond the first postoperative week. Anesthesia related risks were more frequently encountered in patients receiving Merocel nasal pack.

Results of the present study have shown that bleeding was more apparent in cases that did not receive any nasal packing following septoplasty. In contrast, this group yielded more favorable scores with respect to nasal obstruction and pain. Interestingly, these differences between groups in terms of pain, bleeding and nasal obstruction disappeared after the first week. Thus, we suggest that the selection of nasal pack seems to have short-term effects rather than yielding long term consequences. Owing to the fact that discomfort reported by the patient is an important drawback for both patients and physicians, nasal packs should be avoided at all if possible.

Formation of synechia or crusting, the need for an oropharyngeal airway and length of stay in the recovery room were similar between the groups. Surgery without nasal packs seems to be more suitable for patients who are more vulnerable to anesthesia related problems and obstructive problems such as obstructive sleep apnea.

There seems to be no single nasal pack that is suitable for all indications. High standards of patient care can be accomplished if we have a spectrum of nasal packs in reserve for various indications. The decision for nasal pack use and selection of the appropriate type must be determined with respect to clinical features of the patient and in conjunction with anesthesia related risks such as obstructive disorders.<sup>[2]</sup> Atraumatic technique, meticulous intraoperative hemostasis and close collaboration with anesthesiology are key points in decision making for nasal packing.

The present study possesses some important limitations. Coexistent systemic, respiratory, cardiovascular and metabolic conditions may affect coagulation profile as well as anesthesia related morbidities. The relatively small sample size of our series, personal variability in pain

sensitivity and restrictions attributed to the experience of a single institution must also be remembered in the interpretation of our results. The assessment of variables with VAS or bolsters may be limited due to subjectivity of the methods. Additionally, patients were not operated on by the same surgeon nor were they anesthetized by the same anesthesiologist. These differences may also affect not only the intraoperative but also postoperative period.

In conclusion, the use of nasal packs can be more appropriate in patients likely to suffer from bleeding related morbidity after septoplasty. On the other hand, septal surgery without nasal packs can be a better option for patients who are likely to suffer from nasal obstruction more prominently. The use of nasal packs in septoplasty must be determined on an individual basis with respect to the characteristics of each patient.

#### **Declaration of conflicting interests**

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

#### **Funding**

The authors received no financial support for the research and/or authorship of this article.

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