

## COMPARATIVE STUDY OF DIFFERENT TYPES OF NASAL PACKING IN SEPTOPLASTY

By

**Mahmoud Mohamed Abd Al-Azim Soliman, Wael Hassan Abu Al-Wafa  
and Mohammad Amin Al-Morsy**

Department of Otorhinolaryngology, Faculty of Medicine, Al-Azhar University

**Corresponding author:** Mahmoud Mohamed Abd Al-Azim Soliman,

**E-mail:** [mahmoud-mohamedsoliman80@gmail.com](mailto:mahmoud-mohamedsoliman80@gmail.com)

### ABSTRACT

**Background:** Septoplasty or septal reconstruction is a corrective surgical procedure performed to straighten nasal septum. It may be associated with numerous complications. To minimize these complications, both nasal cavities are frequently packed with different types of nasal packing. The solid and porous characteristics of Merocel not only help in better hemostasis, but also cause more pain during insertion of nasal pack, pain while pack is inside the nasal cavity, and pain during removal of the pack.

**Objective:** To investigate the effect of using Merocel in glove finger over plain Merocel as a nasal packing after septoplasty.

**Patients and methods:** Data for this study was collected from patients attending in Al-Sahel teaching hospital during period from March 2019 to December 2020. In this study, the total number of patients is 60, the age ranged from 18 to 45 (38 males, 22 females). All patients presented with symptomatic deviated nasal septum. All cases are diagnosed after taking a detailed history regarding nasal obstruction and associated symptoms like nasal discharge and headache and by endoscopic examination to detect the site of deviation and other nasal abnormalities.

**Results:** In this study the range of pain scoring in group A was (1-6) and the mean  $\pm$ SD was  $3.300 \pm 1.291$  while the range in group B was (3-9) and the mean  $\pm$  SD was  $6700 \pm 1.489$ . In this study, moderate bleeding was observed in one patient (3.33%) during pack removal in Group A. In Group B, 18 patients (60%) had moderate bleeding on pack removal, suggesting that glove finger-coated Merocel plays a role in avoiding friction between Merocel and surgical wound on pack removal, which reduces mucosal damage or bleeding amount. In this study, mild postoperative crustation was observed in 10 patients (33.33%) after pack removal in group A, while in group B there were 14 patients (46.67%). There were no patients with moderate postoperative crustation in group A, while in group B there were 10 patients (33.33%).

**Conclusion:** Gloved Merocel produces less pain and bleeding during its removal and less postoperative crustation, adhesion and inflammation. Gloved Merocel is preferred over ungloved Merocel as nasal packing following septoplasty. Thus, glove finger Merocel can be used as an excellent packing material.

**Keywords:** Nasal packing, Septoplasty, Gloved Merocel.

### INTRODUCTION

Nasal packs are widely used in the otorhinolaryngology practice, especially following nasal surgery and epistaxis. In addition to preventing nasal bleeding after nasal surgery, these packs have the

potential to support the mucoperichondrial flaps and to minimize the risk of formation of septal hematoma and adhesions (*Ozcan et al., 2011*).

A number of different nasal packing materials are available for these purposes

such as ribbon gauze with or without medications, absorbable biomaterials, merocel and nasal splints. The type of the nasal packing material used will depend on the performance and experience of the surgeon, the ease of insertion and removal and patient discomfort or pain, especially during removal (*Bresnihan et al., 2010*).

Postoperative pain is considered to be the most common morbidity associated with packs used in septoplasty. In addition; nasal pack may result in significant mucosal injury and loss of ciliary function. Many attempts, such as shortening the duration of packing and developing new packing material, have been made to minimize the morbidity associated with packing materials (*Dag et al., 2014*).

Merocel is the most popular commercial product and has a widespread use around the world. It is a kind of foam pack made of polyvinyl acetate and is packaged in a compressed, dehydrated state to allow ease of insertion. It requires rehydration with saline to activate it. Merocel has both solid and porous characteristics (*Deniz et al., 2014*).

The pore gets swollen, causes hemostasis, exerts equal pressure on both sides of septum, and keeps the septum straight following the surgery. However, the most important disadvantage of plain Merocel is the pain. This occurs during insertion of pack, while nasal pack is inside the nasal cavity, and during removal of the nasal pack. It adheres to the bleeding site, incision site, and other raw areas over the septum (*Akbari et al., 2012*).

These disadvantages may be overcome by using finger gloved Merocel instead of

simple Merocel. The number of studies on the efficacy of Merocel in glove finger during septoplasty is limited. This clinical trial was undertaken to compare the patients' tolerance and complications of the gloved and ungloved Merocel packs after septoplasty (*Çelik et al., 2013*).

**The aim of this study was to investigate the effect of using Merocel in glove finger over plain Merocel as a nasal packing after septoplasty.**

## PATIENTS AND METHODS

Data for this study was collected from patients attending in Al-Sahel teaching hospital during period from March 2019 to December 2020.

In this study, the total number of patients is 60, the age ranged from 18 to 45 (38 males, 22 females). All patients presented with symptomatic deviated nasal septum. All cases are diagnosed after taking a detailed history regarding nasal obstruction and associated symptoms like nasal discharge and headache and by endoscopic examination to detect the site of deviation and other nasal abnormalities.

Also all cases are investigated by C.T scan on the nose and paranasal sinuses by coronal and axial cuts bone window.

This study was approved by ethical committee of Ear, Nose and Throat department, Faculty of Medicine, Al Azhar University.

### Inclusion criteria:

- Patients undergoing septoplasty for symptomatic deviated nasal septum in the age range of 18–60 years

- Patients' willingness to participate in the study
- Patients without any previous history of nasal surgery
- Patients without any rhinosinusitis or systemic disorders.

**Exclusion criteria:**

- Patients below age of 18
- Patients with fungal sinusitis, sinonasal polyposis, granuloma and neoplasm of nose and paranasal sinuses.
- Patients did a previous septoplasty.
- Patients refuse or unfit for surgery.

**Method of data collection:**

All patients are divided into two groups. In patients belonging to Group A, nasal packing was done with gloved Merocel (Merocel 10 cm) after septoplasty and, while in Group B, packing was done with ungloved Merocel.

Surgery was performed under general anesthesia. Nasal cavity was infiltrated by 2% xylocaine with adrenaline (1 in 1,000,000), a slightly curvilinear incision was made 2 mm–3 mm above the caudal end of septal cartilage on the convex side. In case of caudal dislocation, a transfixion or hemi transfixion incision was made.

Mucoperichondrial/ mucoperiosteal flaps were raised. The septal cartilage was separated from the vomer and ethmoid plates and the mucoperiosteal flap was raised on the opposite side. Maxillary crest was removed to realign the septal cartilage.

To correct the bony septum, the deformed parts were removed. Gloved or ungloved Merocel packs were inserted.

The gloved Merocel pack was prepared by inserting Merocel into a powder free glove finger and then packing the nasal cavity. Absorption of blood and secretions by Merocel was promoted by incising four or five regions of the glove fingers with a scalpel.

The free end of the glove finger was sutured together with silk of 2.0 to prevent the escape of the tampon from the nasal passages. Ungloved Merocel is a plain Merocel packing. The pack was removed on the 3<sup>rd</sup> postoperative day. All patients received antibiotics, analgesics, and antihistamines for one week postoperatively.

Pain while removal of pack were assessed by Visual Analog Scale (VAS) numbered from 0 to 10 (0 represents the least pain and discomfort, whereas 10 means the maximum pain and discomfort).

**Bleeding during pack removal was graded as follows:** 0, no bleeding; 1, mild bleeding (controlled spontaneously without any intervention); 2, moderate bleeding (controlled by the insertion of ephedrine soaked cottonoids); and 3, severe bleeding (controlled by repacking). The patients were followed up weekly for 4 weeks after surgery. At each follow up visit, nasal endoscopy was performed to look for inflammation, crusting, adhesion, and septal perforation.

**Crusting was graded as follows:** 0, no crusting; 1, minimal crusting; and 2, gross crusting. Adhesions were graded as follows: 0, no adhesion, 1, mild (easy to detach); 2, moderate (hard to detach); and 3, severe (need synechiolysis). Inflammation was graded as 0, no

congestion; 1, congestion; 2, ulceration; and 3, granulations.

#### Statistical analysis:

The collected data were coded, processed and analyzed using the SPSS (Statistical Package for Social Sciences) version 22 for Windows® (IBM SPSS Inc, Chicago, IL, USA). Data were tested for normal distribution using the Shapiro Walk test. Qualitative data were represented as frequencies and relative

percentages. Chi square test ( $\chi^2$ ) to calculate difference between two or more groups of qualitative variables. Quantitative data were expressed as mean  $\pm$  SD (Standard deviation). Independent samples t-test was used to compare between two independent groups of normally distributed variables (parametric data). P value  $< 0.05$  was considered significant.

## RESULTS

In present study, the age of the patients was in the range of 18–60 years in both groups. Majority of the patients were in the age group of 18–45 years in both groups. The mean age of the gloved Merocel group was  $27.733 \pm 5.601$  years

and that of the ungloved Merocel group was  $28.100 \pm 7.685$ .

In present study there are 60 patients divided into two groups. Group A include 18 males (60%) and 12 females (40%). Group B include 22males (73.33%) and 8 females (33.33%) (**Table 1**).

**Table (1): Age and sex groups**

Age	Group A			Group B			P-value
Range	20	-	45	20	-	47	0.833
Mean $\pm$ SD	27.733	$\pm$	5.601	28.100	$\pm$	7.685	
Sex	N		%	N		%	0.273
Male	18		60.00	22		73.33	
Female	12		40.00	8		26.67	
Total	30		100.00	30		100.00	

The mean score for pain during pack removal for gloved Merocel was  $3.300 \pm 1.291$  and that for ungloved Merocel was  $6.700 \pm 1.489$ . There was a statistically significant difference between both the packs ( $P < 0.001$ ) (**Table 2**).

**Table (2): Pain during removal of nasal packing**

Groups Pain	Group A			Group B			P-value
Range	1	-	6	3	-	9	$<0.001^*$
Mean $\pm$ SD	3.300	$\pm$	1.291	6.700	$\pm$	1.489	

In present study group A includes 11 patients without bleeding during removal of gloved merocel (36.67%) ,18 patients with mild bleeding (60%), one patient with moderate bleeding (3.33%) and no patients with severe bleeding (00,00%).

Group B includes no patients without bleeding (00.00%), 6 patients with mild bleeding (20%), 18 patients with moderate bleeding (60%) and 6 patients with severe bleeding (20.00%) (**Table 3**).

**Table (3): Bleeding during removal of nasal packing**

Bleeding \ Groups	Group A		Group B		Total		P-value
	N	%	N	%	N	%	
No	11	36.67	0	0.00	11	18.33	<0.001*
Mild	18	60.00	6	20.00	24	40.00	
Moderate	1	3.33	18	60.00	19	31.67	
Severe	0	0.00	6	20.00	6	10.00	
Total	30	100.00	30	100.00	60	100.00	

In present study group A includes 20 patients without Crusting after removal of gloved merocel (66.67%) ,10 patients with mild Crusting (33.33%), no patients with moderate Crusting (00.00%) and no patients with severe crusting (00.0%). Group B includes 6 patients without Crusting (20%), 14 patients with mild Crusting (46.67%), 10 patients with moderate Crusting (33.33%) and no patients with severe Crusting (00.00%).

adhesions (30.00%), 12 patients with mild adhesions (40.00%), 6 patients with moderate adhesions (20.00%) and no patients with severe adhesions (00.00%).

In present study group A includes 19 patients without adhesions after removal of gloved merocel (63.33%) ,11 patients with mild adhesions (36.67%), no patients with moderate adhesions (0%) and no patients with severe adhesions (00,00%). Group B includes 9 patients without

In present study group A includes 9 patients without Inflammations after removal of gloved merocel (30.00%), 11 patients with mild Inflammations (36.67%), 10 patients with moderate Inflammations (33.33%) and no patients with severe Inflammations (00.00%). Group B includes 3 patients without Inflammations (10.00%), 12 patients with mild Inflammations (40.00%), 11 patients with moderate Inflammations (36.37%) and no patients with severe Inflammations (00.00%) (**Table 4**).

**Table (4): Crusting, adhesions and inflammations after removal of nasal packing**

Parameters		Group A		Group B		Total		P-value
		N	%	N	%	N	%	
Crusting	No	20	66.67	6	20.00	26	43.33	<0.001*
	Mild	10	33.33	14	46.67	24	40.00	
	Moderate	0	0.00	10	33.33	10	16.67	
	Severe	0	0.00	0	0.00	0	0.00	
	Total	30	100.00	30	100.00	60	100.00	
Adhesions	No	19	63.33	9	30.00	28	46.67	0.006*
	Mild	11	36.67	12	40.00	23	38.33	
	Moderate	0	0.00	6	20.00	6	10.00	
	Severe	0	0.00	3	10.00	3	5.00	
	Total	30	100.00	30	100.00	60	100.00	
Inflamma- tion	No	9	30.00	3	10.00	12	20.00	0.032*
	Mild	11	36.67	12	40.00	23	38.33	
	Moderate	10	33.33	11	36.67	21	35.00	
	Severe	0	0.00	4	13.33	4	6.67	
	Total	30	100.00	30	100.00	60	100.00	

## DISCUSSION

In this study results indicate that the use of a glove finger for application of Merocel packing significantly reduces pain and bleeding during pack removal and postoperative crustations, adhesions and infection. We attribute this to less adherence of the glove finger to the structures inside the nose.

The mean VAS score was higher for ungloved Merocel during removal of pack. These findings support the fact that use of Merocel, due to its potential to adhere to mucosal surfaces, leads to pain during its removal. Study results indicate that the use of a glove finger for application of Merocel packing significantly reduces pain during pack removal. We attribute this to less adherence of the glove finger to the structures inside the nose.

A study by *Celebi et al. (2013)* examining the effect of duration of Merocel in glove finger on postoperative morbidity concluded that keeping Merocel

inside a glove finger in place for 48 h notably reduces pain occurring during removal and prevents synechiae, bleeding, and septal hematoma without compromising patient comfort. The study conducted by *Kim et al. (2012)* also showed significant difference in mean VAS scores in terms of pack removal between the two groups (*Garth and Brightwell, 2010*).

In this study the range of pain scoring in group A was (1-6) and the mean  $\pm$ SD was  $3.300 \pm 1.291$  while the range in group B was (3-9) and the mean  $\pm$  SD was  $6700 \pm 1.489$ .

In this study, moderate bleeding was observed in one patient (3.33%) during pack removal in Group A. In Group B, 18 patients (60%) had moderate bleeding on pack removal, suggesting that glove finger-coated Merocel plays a role in avoiding friction between Merocel and surgical wound on pack removal, which reduces mucosal damage or bleeding amount.

In this study, mild postoperative crustation was observed in 10 patients (33.33%) after pack removal in group A, while in group B there were 14 patients (46.67%). There were no patients with moderate postoperative crustation in group A, while in group B there were 10 patients (33.33%).

In this study, mild postoperative adhesions were observed in 11 patients (36.67%) after pack removal in group A, while in group B there were 12 patients (40.00%). There were no patients with moderate postoperative adhesions in group A, while in group B there were 6 patients (20.00%).

In this study, mild postoperative inflammation was observed in 11 patients (36.67%) after pack removal in group A, while in group B there were 12 patients (40.00%). There were 10 patients with moderate postoperative inflammation (33.33%) in group A, while in group B there were 11 patients (36.67%).

### CONCLUSION

In this study we compared the use of merocel and gloved merocel as a nasal pack after septoplasty in patients to show which of them is more hemostatic, less painful and fewer incidences of postoperative crustation, adhesion and inflammation.

Gloved Merocel produces less pain and bleeding during its removal and less postoperative crustation, adhesion and inflammation.

Gloved Merocel is preferred over ungloved Merocel as nasal packing following septoplasty. Thus, glove finger Merocel can be used as an excellent packing material.

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## دراسة مقارنة للأنواع المختلفة لحشو الأنف فى عمليات تقويم الحاجز الأنفي

محمود محمد عبد العظيم سليمان, وائل حسن أبو الوفا, محمد أمين المرسي

قسم الأنف والأذن والحنجرة, كلية الطب, جامعة الأزهر

**خلفية البحث:** عملية استبدال الحاجز الأنفي يتم إجراؤها لكثير من المرضى والتي نقوم فيها بإزالة الجزء الغير مستقيم فى الحاجز الأنفي ليستعيد المريض نفسه من الأنف بصورة طبيعية من فتحتي الأنف لعملية إستبدال الحاجز الأنفي بعض المضاعفات ولتجنب معظم هذه المضاعفات نقوم بوضع حشو انفي امامي. لا تساعد الخصائص الصلبة والمسامية للميروسيل فى تحسين الإرقاء فحسب، بل تسبب أيضًا المزيد من الألم أثناء إدخال عبوة الأنف، والألم أثناء وجود العبوة داخل تجويف الأنف، والألم أثناء إزالة العبوة.

**الهدف من البحث:** دراسة تأثير استخدام حشو الميوسيل داخل إصبع جوب جرابي على الميوسيل العادي كحشو للأنف بعد جراحة الحاجز الأنفي.

**المرضى وطرق البحث:** تم جمع بيانات هذه الدراسة من المرضى الذين يحضرون بمستشفى الساحل التعليمي خلال الفترة من مارس 2019 إلى ديسمبر 2020. فى هذه الدراسة، بلغ إجمالي عدد المرضى 60 مريضاً، وتراوحت أعمارهم من 18 إلى 45 (38 ذكراً، 22 إناث). قدم جميع المرضى مع الحاجز الأنفي المنحرف أعراض. يتم تشخيص جميع الحالات بعد أخذ تاريخ مفصل عن انسداد الأنف والأعراض المصاحبة له مثل إفرازات الأنف والصداع ومن خلال الفحص بالمنظار للكشف عن موقع الانحراف والتشوهات الأنفية الأخرى.

**نتائج البحث:** فى هذه الدراسة ، كان نطاق درجات الألم فى المجموعة أ (1-6) وكان المتوسط  $3.300 \pm 1.291$  SD  $\pm$ ، بينما كان النطاق فى المجموعة ب (3-9) وكان المتوسط  $6700 \pm 1.489$  SD  $\pm$ . وفى هذه الدراسة ، لوحظ نزيف معتدل فى مريض واحد (3.33%) أثناء إزالة العبوة فى المجموعة أ. فى المجموعة ب، كان 18 مريضاً (60%) يعانون من نزيف معتدل عند إزالة العبوات، مما يشير إلى أن الميوسيل المغلف بإصبع القفاز يلعب دوراً فى تجنب الاحتكاك بين

الميروسيل والجرح الجراحي عند إزالة العبوة، مما يقلل من تلف الغشاء المخاطي أو كمية النزيف. في هذه الدراسة، لوحظ تقشر خفيف بعد العملية الجراحية في 10 مرضى (33.33%) بعد إزالة العبوات في المجموعة A، بينما في المجموعة B كان هناك 14 مريضاً (46.67%). لم يكن هناك مرضى يعانون من التقشر المتوسط بعد العملية الجراحية في المجموعة A، بينما في المجموعة B كان هناك 10 مرضى (33.33%).

**الاستنتاج:** قفاز الميروسيل ينتج عنه ألم ونزيف أقل أثناء إزالته وتقشر بعد العملية الجراحية والالتصاق والالتهاب. يفضل استخدام قفاز الميروسيل على الميروسيل غير المحبب باعتباره حشواً للأنف بعد جراحة الحاجز الأنفي. وبالتالي، يمكن استخدام قفاز الميروسيل كمادة تغليف ممتازة.

**الكلمات الدالة:** تعبئة الأنف، تجميل الحاجز الأنفي، قفاز الميروسيل.