POST OPERATIVE CARE AFTER SEPTOPLASTY: COMPARISON OF ISOTONIC SALINE and SALINE WITH HYALURONATE

SEPTOPLASTİ SONRASI BAKIM: İZOTONİK SERUM İLE HYALURONATLI SERUM KARŞILAŞTIRILMASI

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ABSTRACT

Isotonic saline solution has been using for a long time but hyaluronic solutions are started to use widely after endonasal procedures. There is no study about the comparison of hyaluronic and saline solutions after septoplasty. Our aim in the study is to investigate effect of solutions on postoperative care after septoplasty.

Prospective blind study was designed. Forty-six individuals who have septal deviation included to tje study. Group 1 used isotonic saline, Grup 2 used hyaluronic irrigation.

Mucociliary activity, peak nasal inspiratory flow meter, VAS were measured; preoperative, postoperative 10th day and 21st day.

In group 2 mucociliary activity accelerated from 932 seconds to 827 seconds but this acceleration was not significant. (p:0.108)

In group 1 flow decreases, (p:0.043) in group 2 flow increases significantly. (p:0.002)

Nasal crusting showed no difference between the groups.

Hyaluronic irrigation has positive effect after septoplasty operation. Isotonic saline solution compare to hyaluronic solution has no difference but isotonic had worse results.

Keywords: Septoplasty, hyaluronic acid, septoplasty care, isotonic nasal irrigation, hyaluronic nasal irrigation

ÖZET

Nazal cerrahiler sonrası izotonik serum içeren solüsyonlar uzun süredir kullanılmaktadır ancak hyalüronik asit içeren solüsyonlar da kullanılmaya başlamıştır. Septoplasti sonrası bu iki solüsyonu karşılaştıran çalışma yoktur. Çalışmamızdaki amaç septoplasti sonrası bakımda bu solüsyonların etkisini araştırmaktır.

Prospektif kör bir çalışma planlandı. Septum deviasyonu olan 46 hasta çalışmaya dahil edildi. Grup 1 izotonik serum, grup 2 hyaluronik içerek yıkama kullandı.

Mukosilier aktivite, peak nazal inspiratuar akım, VAS skorları preoperatif, post operatif 10 ve post operatif 21 ‘inci günlerde değerlendirildi.

Grup 2’de mukosilier aktivite 932 saniyeden 827 saniyeye ilerlemiştir ancak bu hızlanma anlamlı değildir. (p:0.108)

Grup 1 de flow metre ölçümleri azalmış (p:0.043); grup 2 de ise anlamlı olarak artmıştır. (p:0.002). Post operatif kabuklanma gruplar arasında farklı değildir.

Septoplasti sonrası jyalüronik asit içeren irrigasyonun olumlu sonuçları vardır. İki sıvı karşılaştırıldığından izotonik solüsyonun sonuçları daha kötü olmakla birlikte istatistiksel olarak anlamlı fark elde edilmemiştir.

Anahtar Kelimeler: Septoplasti, Hyaluronik asit, septoplasti bakımı, izotonik nazal irrigasyon, hyaluronik nazal irrigasyon

INTRODUCTION

The nasal septum divides the two halves of the nose into right and left nasal spaces. When this structures displaced to one side; this situation is called nasal septal deviation (NSD). NSD is a frequent anatomic variation. In the literature NSD is reported between 1-80%. (D.G. Roblin, R. Eccles.2020)

The tr eatment of NSD is septoplasty operation. To prevent synechias, increase mucosal healing and mucociliary activity also remove crusting and debris; irrigation solutions are often used after septoplasty operation. (Talbot AR, Herr TM, Parsons DS 1997, Keojampa BK, Nguyen MH, Ryan MW 2004)

Isotonic saline solution has been using for a long time after endonasal surgeries. (Unal M, Gorur K, Ozcan C 2001) This solution has no harmful effect on the morphology of the normal nasal human epithelial cell. (Kim CH et al 2005)

Solutions which include hyaluronic acid are started to use widely after endonasal procedures.

Nasal irrigation plays a critical role after functional sinus surgery and in studies it is shown that irrigation with hyaluronic acid has better results. (Mozzanica F et al 2019)

It was demostrated that hyaluronic acid accelerate mucociliary activity and improve nasal mucosa recovery time after septoplasty (Klinger F 2017) but no comparison was made with isotonic saline.

In our study we compare hyaluronic acid irrigation solution and isotonic saline solution on mucociliary activity, VAS scores of comfort, nasal crusting and peak nasal inspiratory flow. This is the first study which compare these solutions after septoplasty.

MATERIAL AND METHODS

Prospective blind study was designed. Forty-six individuals who have septal deviation included to tje study. Group 1 used isotonic saline, Grup 2 used hyaluronic irrigation. Approval of this study was obtained from ethical board(Ankara Yıldırım beyazıt ethical board date 05/03/2018 no.26379996). Forty six individuals who has NSD one side total obstruction but no other diseases; ages 18-50; were included for this study. The NSD was diagnosed based on the presence of nasal obstruction complaint, anterior rhinoscopy and nasal endoscopy (0˚ C Karl-Storz GmBH&Co, Tuttingen, Germany). Paranasal sinus tomograpy was performed to all patient to exclude other nasal pathologies. Patients with acute-chronic infectious diseases, with diabetes mellitus, obesity, cardiovascular disease, cerebrovascular disease, kidney disease, liver disease, acute or chronic systemic diseases such as malignancy, smoker, alcohol user, history of local or systemic steroid use, with a history of nasal surgery and other nasal pathologies diagnosis via paranasal tomography were excluded from this study.

Patients divided into two. All patients operated by same surgeon via standart septoplasty operation in general anesthesia which Cottle was defined in 1948. (Cottle MH , Loring RM 1948)

No complication was occured. Group 1 used %0.9 buffered isotonic saline irrigation, Group 2 used sodium hyaluroic acid nasal irrigation after septoplasty for 21 days.

Mucociliary activity was measured by the saccharine clearance test. Test was performed before the surgery, postoperative 10th day and postoperative 21th day. Test was performed as conducted by Andersen et al. (Andersen I et al 1974)

This method is an inexpensive, simple and effective method that is used for the measurement of mucociliary activity. A quarter of the saccharine tablet was placed about 1.5 cm behind the inferior turbinate and in the meanwhile, the patient was told to face straight, recommended normal breathing, and was told not to sniffle or breathe deeply. The period up to the taste came to the mouth was recorded. The saccharin test was performed only by blind researchers who were mentioned in the publication and experienced in performing the test. The results of different control periods of both groups were compared.

To evaluate nasal obstruction In-Check Nasal Inspiratory Flow Meter was used. Test was performed before the surgery, postoperative 10th day and postoperative 21th day. Peak nasal inspiratory flow (PNIF) was measured first by each subject in a sitting position. The device was a combination of a basic peak flowmeter (PEF-meter) and rubbery anesthesia face masks of variable sizes. The mask had to be large enough not to press the nose or mouth, and small enough to prevent air leakage under the chin. Each participant was asked to take a deep breath, put the mask on to cover the nose and mouth, and to exhale sharply through the nose. The best of three results was recorded. Participants who had problems with the technique were permitted to make more attempts. After cleaning of the mask, each participant measured the PNIF with an In-check peak flow meter (In-check, Clement Clarke Int. Ltd, Essex, UK), recording the best result of three forced inspirations. (Ottaviano G, Fokkens WJ 2016)

VAS for nasal crusting was performed by blind researchers who participated in the study but do not know which solution was applied to which patient; 0 means no crusting 10 means full crusting. Patients were also evaluated by VAS for nasal obstruction after septoplasty. 0 means no obstruction 10 means full obstruction.

The study was done with the priciples of Helsinki Decleration and informed consent form was thken from the patients.

Statistical analyses

Data was analyzed using the SPSS version 21.0 software program (Statistical Package for Social Sciences v.21, IBM, Chicago, IL). Pearson Chi-Square test was used to investigate the association between categorical sex variables. The Student t test was used to compare continuous numerical variables between groups. Paired t test was used to compare the preoperative and postoperative values in each group.

RESULTS

This study included 46 subjects, including 25 in the group 1 (isotonic saline nasal irrigation) and 21 in the group 2 (hyaluroic acid nasal irrigation) . There was no difference in age between groups (p: 0.484). There was no difference in the proportion of female proportion between groups (p: 0.847).

There was no significant difference between two groups in terms preoperative saccarin test results. (p: 0.701). There was no significant difference between two groups in terms preoperative flow meter results. (p: 0.268)

There was no significant difference between two groups in terms postoperative saccarin test results in 10th and 21st day. (p:0.115, p:0.108 respectively) but in group 2 mucociliary activity accelerated from preoperative 932 seconds to post operative 21th day 827 seconds. This acceleration was not significant.

Table 1. Saccarine test results

	presaccarin	Post10	Post21	p★
Group 1	882.32±469.82	932.20±491.24	840.04±491.22	0.115
Group 2	932.25±375.18	839.90±493.27	827.25±460.09	0.108
p★★	0.701	0.535	0.929	

★Repeated measures ANOVA test; ★★Student t test

There was no significant difference between two groups in terms postoperative flowmetry test results but there is significant difference in two groups pre and post operative flowmetry results. In group 1 flow decreases significantly (p:0.043) and in group 2 flow increases significantly. (p:0.002)

Table 2. PNIF test results

	preflow	Post10	Post21	p★
Group 1	93.20±64.33	80.20±39.75	83.80±40.18	0.043
Group 2	73.50±50.05	80.25±54.05	91.25±58.35	0.002
p★★	0.268	0.997	0.615	

★Repeated measures ANOVA test; ★★Student t test

There was significant difference in two groups in terms of VAS postoperative nasal obstruction after septoplasty. (p<0.001) Two group both improved VAS scores.

There was no significant diffence in terms of nasal crusting VAS scores in day 10 (p=0.828) and day 21 between the groups. (p=0.814)

DISCUSSION

Deviation of the nasal septum is one of the commonly seen problem in otorhinolaryngology practise and septoplasty is a frequently performed surgical application by otorhinolaryngologists. (Mutlu V. 2019)

Post operative care of septoplasty operation is always a up to date topic because of the frequency of the surgery.

Nasal irrigation solutions are commonly recommend by otorhinolaryngologist for the postoperative care of septoplasty operation. Irrigation clears secretions and debris also prevents from crusting. Different kind of nasal irrigation solutions such as isotonic saline, lactated Ringer's solution and hypertonic saline solutions have been used. (Süslü N et al 2009)

New solutions are constantly released to the market and hyaluronic acid solutions are promising for wound healing. Hyaluronic acid (HA) is a glycosaminoglycan, which is found in extracellular matrix of connective tissue. It is an accurate regulator of inflammatory responses, cellular damage, tissue remodelling and tissue repair. HA plays role in the mucosal surfaces repair and in the recovery of the surgical wounds due to nasal mucosa also has good effect on mucociliary activity and mucosal surface restoration. The effect of hyaluronic acid after septoplasty is not well defined. (King SR, Hickerson WL, Proctor KG 1997, Voigt J, Driver VR 2012,Fong E et al 2007,Chen Q et al 2012,Esser P 2012,Kimmelman CP et al 2009,Gelardi M et al 2013,Manzanares D et al 2007, Cassano M et al 2018)

Hyaluronic acid irrigations had been used after endoscopic sinus surgeries of chronic rhinosinusitis. It is shown that they are well tolerated, have benefit to adhesion rate and mucosal healing. (Fong E et al 2017)

Mucociliary clearance which can be measured by saccarine test; plays a critical role in nasal protection against infections and adversely effect after septoplasty operation. In postoperative care of septoplasty, nasal irrigation solutions are commonly used and their effect on mucociliary clearence is very important for nasal protection.

There is few study about effect of hyaluronic acid after septoplasty operation and no study compare with isotonic saline solution. (Keojampa BK, Nguyen MH, Ryan MW 2004, Süslü N et al 2009)

From the first control to the last control hyaluronic acid solution had positive effect on mucociliary activity but this effect showed no significant difference. On the other hand isotonic saline solution first decreases the mucociliary activity but at last control the result was better than the preoperative value. These changes also showed no significant difference. We found no significant difference between the groups.

PNIF is a reliable method for objectively evaluating nasal obstruction. Low cost, easy application and the reliability makes the PNIF favorable compared to the other tests. (Ottaviano G, Fokkens WJ 2016, Teixeira RU 2011)

Nasal flow increase from the beginning in the hyaluronic acid solution this increase was statistically significant. In the isotonic saline group nasal flow first decrease then slowly started to increase. That decrease was statistically significant. Hyaluronic acid increase isotonic saline decrease the nasal flow but these changes had no difference between the groups.

Crusting is one of the main discomfort reason after septoplasty and most of the surgeon suggest nasal irrigation for the solution. In our study crusting after septoplasty decrease with irrigation and this decrease shows significant difference. Compare the solutions there is no statistically difference.

Limitations of our study were the number of the patients and short follow up period. The number of the patients is small because of the limitations. One side total deviation patients whose deviation can be managed by Cottle's standart method was limited. If we could managed to follow up patients longer in group one we might found better nasal flow results.

Our study showed that hyaluronic irrigation solution had positive effect after septoplasty operation. Isotonic saline solution compare to hyaluronic solution has no difference but we had worse results. On the other hand two solutions can be used safely after the septoplasty operation.

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