

The impact of using intranasal splints on morbidity and prevalence of adhesions

Khalid A. Al-Mazrou, MD, Siraj M. Zakzouk, MD, FRCS.

ABSTRACT

Objective: To study the effect of using intranasal splints for prevention of adhesions and to assess the morbidity associated with their use.

Methods: A retrospective study based on 2 tertiary hospitals from 1988-1995. One hundred and fourteen patients were divided into 2 groups. Group one with splints and group 2 without. The splints were used for 10 days and nasal toilet was carried out twice. Score of adhesions, perforation, bleeding, pain, crusting, and septum position were recorded.

Results: Adhesions in both groups were almost the same

as well as septum medialization and perforation scores. Pain and crusting were more common in the splinted group (p-value <0.001).

Conclusion: The use of intranasal splints should be individualized. Nasal irrigation is of importance to prevent crusting. The morbidity associated with intranasal splints should be considered before use.

Keywords: Intranasal splints, adhesions, morbidity.

Saudi Med J 2001; Vol. 22 (7): 616-618

The use of intranasal splints (INS) in nasal surgery, especially following septal and turbinate operations, has been widely practiced by Rhinologists. Salinger and Cohen were the first to use INS for surgery of a difficult septum.¹ Several types of materials have been used in the past such as strips of x-ray film, and the polyethylene tops of coffee cans. Recently, several types of pre-formed splints are available, for example silicon or soft splints. The most important and frequent use of splints is to prevent adhesions between the septum and the lateral wall of the nose especially in procedures involving both the septum and the lateral wall structures, mainly inferior turbinates.² Other reasons suggested for the use of INS are to prevent formation of septal hematoma, to provide septal stability in the early postoperative period, to hold the septal graft used to close septal perforation,³ and to support packing in epistaxis.⁴ The prevalence of adhesions which most Ear, Nose and Throat (ENT)

surgeons would like to avoid was reported to be 6-11%.^{5,6} It is even higher (36%) following turbinate resection alone, 31% of turbinate resection in combination with septal surgery and only 7% of other procedures.⁷ Campbell et al showed that the incidence of adhesions following high risk surgery (such as synchronous surgery to septum and lateral wall) was reduced from 26% to 0% by inserting silastic splints at the end of operation and leaving them in place for 7 days.⁸ Eliopoulos and Philippakis reported the use of wax paper enveloping Fucidin® gauze to pack the nose postoperatively and stated that it was very effective in prevention of formation of nasal adhesions.⁹ Most papers published, stress on adhesions and their prevention by using INS, but few concentrate on the morbidity such as pain and crust formation. This study were carried out to examine the role of using INS in preventing adhesions and the morbidity associated with their use.

From the ORL Department, King Abdulaziz University Hospital (Al-Mazrou), and the ENT Department (Zakzouk), Security Forces Hospital, Riyadh, Kingdom of Saudi Arabia.

Received 13th December 2000. Accepted for publication in final form 25th February 2001.

Address correspondence and reprint request to: Dr. Khalid A. Al-Mazrou, ORL Department, King Abdulaziz University Hospital, PO Box 86118, Riyadh 11622, Kingdom of Saudi Arabia. Tel. +966 (1) 4775735. Fax. +966 (1) 4775748. E-mail: kmazrou@ksu.edu.sa

Methods. This is a retrospective study. The charts of 114 patients who underwent septal surgery alone and surgery of the lateral wall of the nose (polypectomy, turbinectomy, and function endoscopic sinus surgery (FESS) with and without septal correction) were reviewed. This was carried out at King Abdulaziz University Hospital and King Fahad National Guard Hospital, Riyadh, Saudi Arabia during the period from January 1988 to September 1995. Splints (Figure 1) were used in 60 patients (53%) and in 54 (47%) no splints were inserted. Following surgery, the noses were packed using Merocel® and some patients had 1/2 inch Vaseline ribbon gauze pack, there were only 5 cases without packing. In almost all cases the pack was left for 48 hours then removed. The noses were washed and suction of secretions were carried out before discharge from the hospital. The splints were removed 10 days postoperatively. The patients were given alkaline nasal wash or saline to use at home. The patients were followed up one month and 3 months after surgery. The presence of adhesions, perforation, bleeding, pain, crust formation, and septal medialization have been recorded in each group.

Results. Of the 114 patients included in this study, 91 were males and 23 were females with a ratio of 4:1. The age range was 10-60 years. The overall mean age was 28 years. The patients were divided into 2 groups: group one comprised of 60 patients (53%) where splints were used, and group 2 comprised of 54 patients (47%) without splints. Sixteen patients had septoplasty alone and the remaining 98 patients had a combination of septoplasty, submucous diathermy, partial inferior turbinectomy and polypectomy, 11 patients had been treated by FESS. The adhesion scores in both groups were not significant (3 (5%) in the splint group and 4 (7%) in the non splint group). Bleeding score was slightly significant in the non splint group (one (2%) in splint group and 5 (10%) in the non splint group with p-value of 0.08). The pain scores were highly significant (p-value <0.001) in the splint group with 28 patients out of 60 (47%) compared to 3 patients out of 54 (6%) in the non splint group. The maximum pain was during removal of the splints. Two cases had vasovagal attacks and needed resuscitation. Perforation and nasal septum scores were not significant with 3 patients (6%) in the splint group and the non splint group. Crusts' formation scores were highly significant in the splint group with 47 patients (78%) compared to the non splint group of 11 patients (20%) p-value <0.001. The septum medialization scores were not significant in which 93% (56 patients) achieved return of the septum to the central position in the splinter group and 91% (49 patients) in the non splinter group.

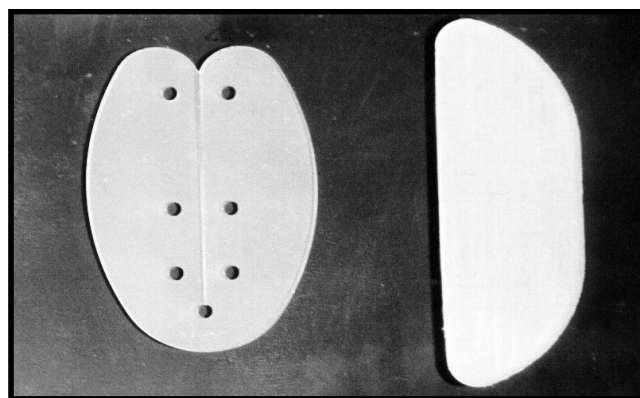


Figure 1 - Reuter bivalve fluoroplastic splint, left, and silicon rubber splint, right. (Xomed surgical products, Jacksonville, FL, USA).

Other complications included: acute sinusitis, bleeding, anosmia, and nasal tip deformity. No toxic shock syndrome cases have been recorded.

Discussion. Since its introduction 45 years ago INS has become, after pressure equalization tubes, the most frequently used prostheses in Otolaryngology. The use of INS was advocated in the early 1970's after Foxen and Gilchrist used them to prevent nasal adhesion.^{10,11} Many ENT specialists still use INS in nasal surgery although this practice was not based on any scientific evidence of their effectiveness.¹² Despite this, the available literature does not give a clear definition of its role in intranasal surgery. There has been controversy regarding the use of INS and its function in preventing intranasal adhesions. Campbell et al found INS to increase morbidity and its use is only justified when definite advantages are likely to be observed for the patient. They advised using INS in patients undergoing multiple nasal procedures because of increased risk of adhesions.⁸ On the other hand, Cook et al did not think it effective in preventing adhesions. They came to a conclusion that there are no clear advantages in inserting INS and they should be used sparingly, if at all.¹³ Von Schoenberg et al found a low risk of adhesion in patients when INS was used 4%. However, 3 months post-operatively, the splinted and non splinted groups had the same low rate of adhesion formation (2 %).¹⁴ Pringle et al carried out a survey of 440 consultants and found that 33% of them never or rarely used INS for nasal surgery and reported an adhesions rate of 5%. Compared with an adhesion rate of 4% for 180 consultants who used INS regularly or sometimes. They finalized by asking "can we justify the routine use of nasal splints or is there a better method of postoperative care with a view to avoidance of adhesion".¹⁵

The incidence of adhesions in our study was not significant. The patients with adhesions were treated in the outpatient clinic under local anesthesia. Watson et al reported recurrent adhesions despite adequate splinting in Wagener's granulomatosis patient. They advised screening patients with recurrent adhesions for an underlying disorder.¹⁶ It seems to be that certain patients have the tendency to form adhesions, such as collagen formation abnormality, more than the patients without such an abnormality. But it is difficult to predict which will develop adhesions.

Pain and soreness that accompanies INS is a well known association. This can be while the INS is in its place or as it is removed. The score of pain in our study is 47% which is in agreement with others.^{8,14} Shone et al were the only ones who cited the formation of crusts when using INS.⁵ In their paper where INS was not used crusting rate was 21% which is similar to our result (20%). However, crusting was highly significant with the use of INS (78%). The formation of crusts may be due to dryness especially in our city (Riyadh) where the humidity may reach as low as 10% during summer time. The presence of INS may affect the ciliary function resulting, together with dryness, in an increased prevalence of crusting. Nasal toilet is important in reducing the rate of crust formation. Perforation of the septum is a well known complication of nasal surgery especially with packing. The incidence of perforation has been reported to be 2.5-3.5%.¹⁷ The use of INS did not increase the risk of perforation as shown by Cook et al¹³ and our study. Bleeding after nasal surgery is mostly from turbinates. White et al reported an incidence of 7%.⁷ The 5 patients (9%) who developed post-op bleeding in this paper were from the non splinted group, but all had turbinate surgery and this may explain the high incidence in this group. Medialization of the septum is one presumed function of INS. Cook et al, in a study on 100 patients found no difference between the splinted and non splinted (80%) group.¹³ This seems to agree with our result (93% and 91%). Our study as well as other studies,^{12,13} has proved that INS were not of significant value in preventing nasal adhesions, but as clearly demonstrated, it increases morbidity (pain, soreness, and discomfort). The use of INS should be restricted to patients predisposed to the formation of adhesions for example revision operation and treatment of established adhesion.

In conclusion, the use of INS in septal surgery has to be individualized. The performance of nasal

suctioning and cleansing, daily if possible, both in hospital and at home after discharge, needs to be considered. Nasal irrigation using saline is of importance to prevent crusting and minimize occurrence of adhesions. The morbidity associated with the use of INS should be taken into consideration.

Acknowledgment. The authors would like to thank Dr. S. A. Kamal for permission to include some of his patients in one of the study groups.

References

1. Salinger S, Cohen D. Surgery of the difficult septum. *Arch Otolaryngol* 1955; 61: 419-421.
2. Johnson N. Septal surgery and rhinoplasty. *Transactions of the American Academy of Ophthalmology and Otolaryngology* 1964; 68: 869-873.
3. Goode R. Magnetic intranasal splints. *Arch Otolaryngol* 1982; 108: 319.
4. Fischer ND, Biggars WP, MacDonald HJ. The bookend nasal septal splint. *Otolaryngol Head Neck Surg* 1981; 89: 104-106.
5. Shone GR, Clegg RT. Nasal adhesions. *J Laryngol Otol* 1987; 101: 555-557.
6. Talaat M, El-Sabawy E, Baky F, Raheem A. Submucous diathermy of the inferior turbinates in chronic hypertrophic rhinitis. *J Laryngol Otol* 1987; 101: 452-460.
7. White A, Murray JA. Intranasal adhesion formation following surgery for chronic nasal obstruction. *Clin Otolaryngol* 1988; 13: 139-143.
8. Campbell JB, Watson MG, Sheno PM. The role of intranasal splints in the prevention of post-operative nasal adhesions. *J Laryngol Otol* 1987; 101: 1140-1143.
9. Eliopoulos PN, Philippakis C. Prevention of postoperative intra-nasal adhesions (a new material). *J Laryngol Otol* 1989; 103: 664-666.
10. Foxen EHM. In: Balantyne J, Groves J, editors. *Scott-Brown's Diseases of the Ear, Nose and Throat*. 3rd ed. London: Butterworths; 1971. p. 174-175.
11. Glichrist AG. Surgery of the nasal septum and pyramid. *J Laryngol Otol* 1974; 88: 759-771.
12. Malki D, Quine SM, Pfeleiderer AG. Nasal splints, revisited. *J Laryngol Otol* 1999; 113: 725-727.
13. Cook JA, Murrant NJ, Evans KL, Lavelle RJ. Intra-nasal splints and their effects on intra-nasal adhesions and septal stability. *Clin Otolaryngol* 1992; 17: 24-27.
14. Von Schoenberg M, Robinson P. The morbidity from nasal splints in 105 patients. *Clin Otolaryngol* 1992; 17: 528-530.
15. Pringle MB. The use of intranasal splints: a consultant survey. *Clin Otolaryngol* 1992; 17: 535-539.
16. Watson MG, Marshall HF. Intranasal adhesions which recur despite splinting: an ominous sign? *J Laryngol Otol* 1990; 104: 426-427.
17. Von Schoenberg M, Robinson P, Ryan R. Nasal packing after routine nasal surgery – is it justified? *J Laryngol Otol* 1993; 107: 902-905.