



Nasal Packing of Calcium Alginate after Endoscopic Sinus Surgery

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ABSTRACT

Sorbsan® (calcium alginate) is an absorbent packing that shows a potent hemostatic effect and can maintain wound surfaces moist. The aim of this study was to evaluate the early symptoms and QOL with Sorbsan® versus Beschitin-F® (chitin-coated gauze) for middle meatus packing after endoscopic sinus surgery (ESS).

We performed a cohort study of 40 patients who underwent ESS. The patients were randomly allocated into 2 groups who underwent insertion of either Sorbsan® or Beschitin-F® into middle meatus.

A daily diary was used to record the symptoms and QOL, measured using visual analogue scales. The scores for each of the symptoms of nasal pain, headache, nasal bleeding and postnasal drip were statistically significantly lower in the Sorbsan® group. The scores for each of the QOL parameters, including the effect on their stay in the hospital and sleep disturbance, were also significantly lower in the Sorbsan® group. There were no findings of postoperative hemorrhage or local infection in either group.

Sorbsan® packing did not cause any major complications and has the potential to reduce nasal pain and suffering in post-ESS patients compared with gauze packing.

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INTRODUCTION

Endoscopic sinus surgery (ESS) is currently the method of choice for surgical treatment of chronic rhinosinusitis (CRS) because of its high level of efficacy and low level of invasiveness. Most patients undergo packing with some sort of material following ESS.

However, the packing materials and the methods of their use differ among institutions, and there remains a lack of satisfaction with regard to both the hemostatic and wound-healing effects as well as the nasal pain inflicted on the patient at the time of insertion and removal of the packing.

Sorbsan® (calcium alginate) is a flocculent absorbent packing that shows a potent hemostatic effect and is able maintain wound surfaces in a moist environment by absorbing and gelling the wound exudate. In addition, because this packing material itself shows potent hemostatic activity, thereby yielding an additional advantage by eliminating the nasal pain caused by insertion and removal of gauze. (Figure1)

The objectives of this study were to compare, using visual analogue scales (VASs), the early symptoms and QOL of patients who underwent post-ESS packing of the middle meatus using either Sorbsan® or Beschitin-F®

METHODS AND MATERIALS

We performed a prospective study of 40 patients who underwent ESS due to a diagnosis of CRS at Jikei University Hospital. Following ESS, the patients were randomly allocated into 2 groups of 20 patients each who underwent insertion of either Sorbsan® or Beschitin-F® into the middle meatus. We show actual use of Sorbsan® when the operation was finished

In the Beschitin-F® group, the gauze was removed on the 2nd day post-ESS, and daily treatment thereafter included debridement, saline irrigation and inhalation of an aerosol containing antibiotics and a steroid. In the Sorbsan® group, the Sorbsan® was not removed while the patient was hospitalized, and the above daily treatment was performed with the Sorbsan® still in place. The patients were instructed to continue irrigation and inhalation of an aerosol containing antibiotics and a steroid. (Figure 2.)

These assessments were performed according to a modification of the method of Bugten et al.¹ and used VASs (0-100) by recording their symptoms, including nasal pain, headache, nasal bleeding, postnasal drip, etc., and their QOL, including the effect on their stay in the hospital, the effect on their intake of food, sleep disturbance, etc.

We use Mann-Whitney U test and Wilcoxon rank sum test as Statistical Methods.

This study was approved by the University Hospital Ethics Committee. In this study, all patients granted informed consent in writing prior to undergoing the ESS.

RESULTS

Table 1 compiles the patient background data for the Beschitin-F® group and the Sorbsan® group. No statistically significance differences were found between the two treatment groups in regard to any of these background characteristics. (Table1) Figure 3 shows VAS score of pre and post ESS symptoms. All of scores decreased gradually with time post-ESS. (Figure3)

1 Body Temperature

In both the Beschitin-F® group and the Sorbsan® group, the body temperature was significantly higher at several hours following the ESS compared with pre-ESS. There were no statistically significant differences between the two groups.

2 Nasal Pain

The nasal pain score increased significantly and peaked following the ESS compared with pre-ESS in both groups. The score was significantly lower in the Sorbsan® group from following the ESS through the 2nd day post-ESS.

3 Headache

The headache score showed a time-course profile similar to that for the nasal pain score in both groups. The score was significantly lower in the Sorbsan® group from following the ESS through the 2nd day post-ESS.

4 Nasal Bleeding

The score was significantly lower in the Sorbsan® group on the 2nd day post-ESS.



Figure 1. Calcium Alginate (Sorbsan®)

	Beschitin-F® group	Sorbsan® group	P value
Cases	20	20	
Sex(Male: Female)	13:7	15:5	0.51
Age	49.3±13.2	50.8±14.4	0.57
Total polyp score	3.3±3.3	4.4±2.0	0.40
CT score (Lund-Mackay)	12.8±7.0	13.0±4.9	0.88
Allergic rhinitis(%)	31.6	35.0	0.86
Asthma(%)	23.8	21.1	0.88
Total IgE	255±311	240±301	0.53
Peripheral eosinophil count(%)	6.4±4.7	6.0±3.8	0.94

Table 1.

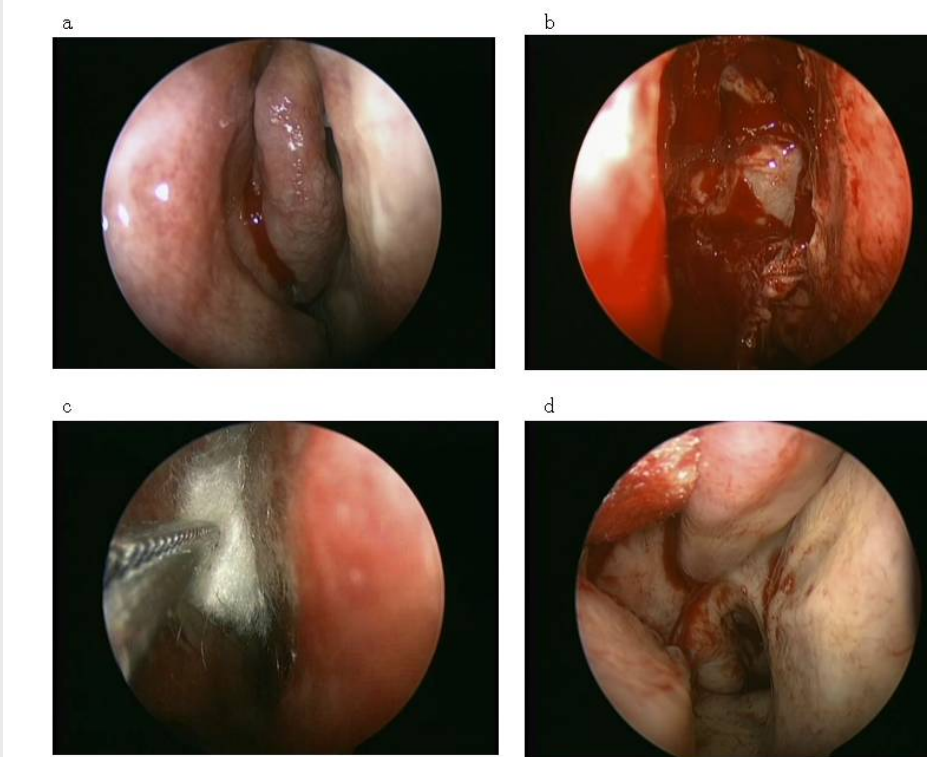


Figure 2. Actual Use

- pre-ESS middle meatus findings: Swelling of the middle turbinate and middle meatus were seen.
- Post-ESS middle meatus findings: After opening the ethmoid, frontal and maxillary sinuses, a small amount of bleeding was seen to persist in the middle meatus.
- Middle meatus findings after insertion of packing: The calcium alginate packing agent was inserted into the middle meatus following ESS.
- Post-ESS choanal findings: When observed 15 min after packing of the middle meatus, the bleeding from the middle meatus had stopped. It is seen that no blood is retained in the nasopharynx.

RESULTS

5 Postnasal Drip

The score was significantly lower in the Sorbsan® group from following the ESS through the 3rd day post-ESS. There were no findings of post-ESS local infection or post-ESS hemorrhage in either group.

Pre-Post ESS QOL shows the time-course profiles, from before the ESS through the 5th day post-ESS, of the mean values for the effects of the packing treatments on the patients' stay in the hospital, the effect on their intake of food and sleep disturbance in both the Beschitin-F® group and the Sorbsan® group. Because the patients did not eat on the day of the ESS following its completion, the graph for intake of food omits that day. (Figure4)

6 Effect on Stay in the Hospital

The score was significantly lower in the Sorbsan® group from immediately following the ESS through the 2nd day post-ESS.

7 Effect on Food Intake

There were no statistically significant differences in the scores between the groups.

8 Sleep Disturbance

The statistically significant difference compared with the pre-ESS score disappeared beginning from the 2nd day post-ESS in both groups. The score was significantly lower in the Sorbsan® group on the 1st day post-ESS.

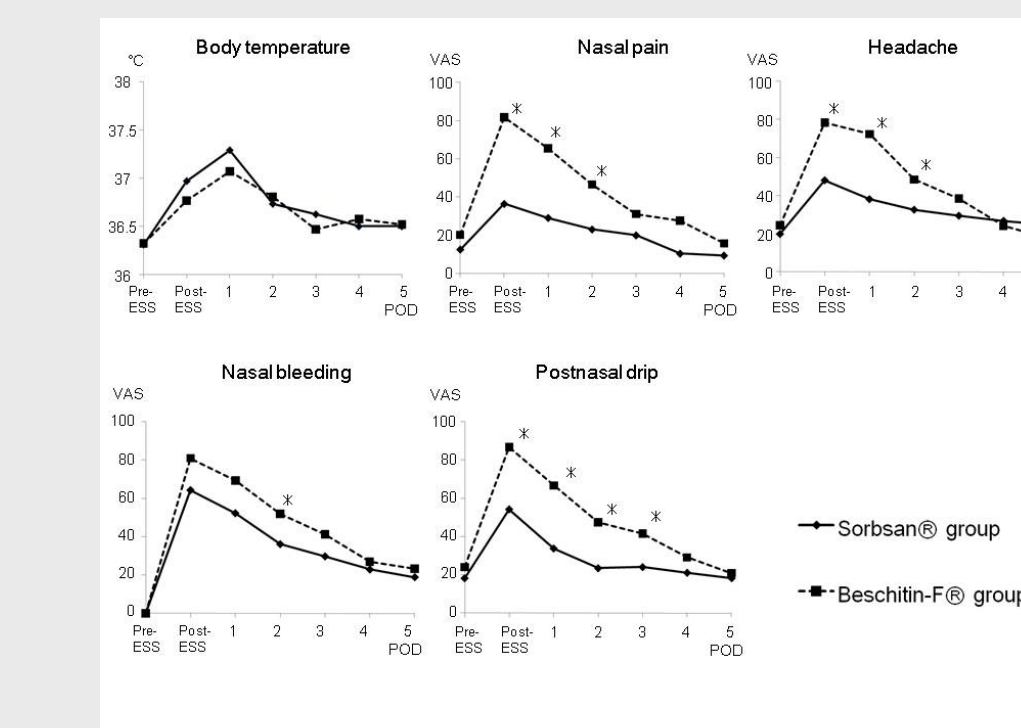


Figure 3. Pre- and post-ESS symptoms (VAS 0-100)

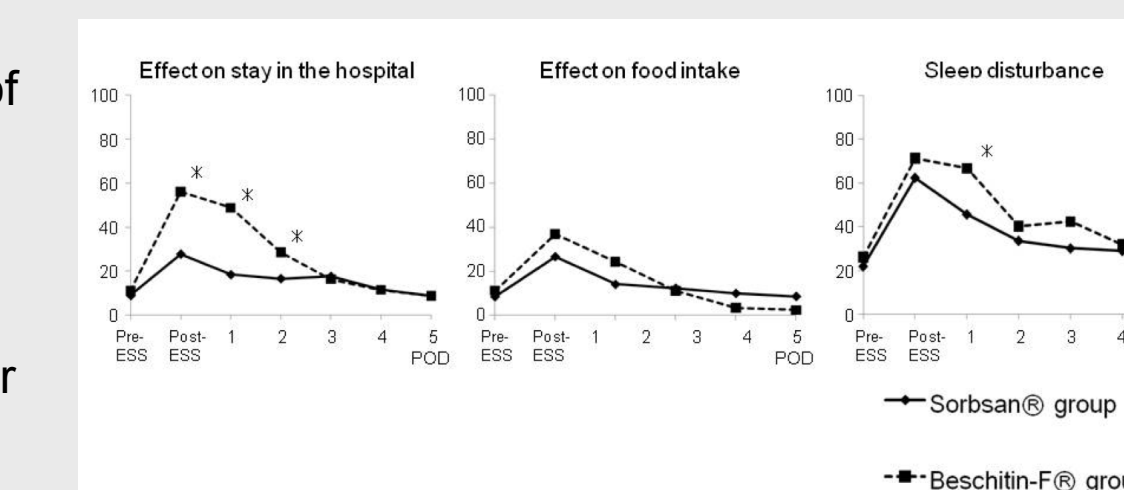


Figure 4. Pre- and post-ESS QOL (VAS 0-100)

DISCUSSION

In our study we found that, in the Beschitin-F® group, all of the analyzed clinical symptoms were significantly worse following ESS compared with their pre-operative scores. And for each of the parameters of nasal pain, headache and the effect on the stay in the hospital, the patients' scores in the Sorbsan® group were significantly lower than the scores in the Beschitin-F® group. These differences can be thought to be explained on the basis of the following differences in the characteristics of the two packing materials.

Alginate fibers contained in calcium alginate are composed of a polysaccharide that is found in brown algae such as kelp and is a copolymer consisting of D-mannuronic acid and L-guluronic acid². Alginate fibers placed in wounds bind to sodium ions contained in blood, exudates and the saline that is used for irrigation and are thereby transformed into a gel.³ This gelation results in a moist environment for the wound surface. It is known that alginate fibers are effective as a wet dressing due to their prevention of drying of the wound and death of cells in the epithelial component, together with their promotion of vascularization as well as the degradation and absorption of necrotic tissue. Sorbsan® is a product that shows weak adhesiveness to membrane tissues and is the only one dispersible material, and for that reason it can be washed out of the nasal cavity by saline irrigation.

Moreover, calcium alginate contributes to hemostasis at wound sites by promoting the synthesis and release of coagulation factors and promotes conversion of prothrombin into thrombin. Calcium alginate is also involved in platelet aggregation and shows a potent hemostatic effect.

CONCLUSIONS

The use of Sorbsan® packing following ESS did not cause any major complications, and the post-ESS symptoms and QOL of the patients can be concluded to have been improved.

In the future, in addition to studying a larger patient population, it will be necessary to investigate whether Sorbsan® packing leads to any differences in post-operative wound healing, such as scab formation, etc.

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