Comparison of Nasal Valve Suspension vs Alar BATTON Graft Placement for Internal Nasal Valve Collapse

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ABSTRACT

Objective: Various methods are used to treat internal nasal valve collapse. We sought to compare nasal valve suspension (NVS) with alar batten grafting (ABG) placement for relief of internal valve collapse.

Study Design: Retrospective case series with chart review.

Methods: All patients that underwent surgery by the primary author with a primary complaint of nasal obstruction were included. Patients were excluded if they had not completed the post-operative questionnaire. Charts and questionnaires were reviewed for data collection.

Results: Over 80 consecutive patients underwent NVS or ABG between 2003 and 2013. Thirty-seven patients (22 nasal valve suspension and 15 alar batten graft) completed the follow-up questionnaire. Average follow-up was 4.6 years. In comparison of the two groups, there was no difference between preoperative (p=0.62) and postoperative scores at 1 week (p=0.23) and 3 months (p=0.56). We did find, however, a significant difference between groups post-operatively at the time of last followup (p=0.02). Patient satisfaction scores were also found to be significantly different (p=0.02), with alar batten graft patients more likely to be “very satisfied.”

Conclusion: Nasal valve suspension and batten graft placement both relieve internal valve collapse. Alar batten graft placement had significantly higher patient satisfaction scores and improved long term results when compared to nasal valve suspension of the upper lateral cartilage.

Keywords: internal nasal valve collapse, functional rhinoplasty, nasal valve suspension, alar batten graft

Level of Evidence: IV

INTRODUCTION

The importance of the internal nasal valve is not to be underestimated. At less than 1 cm² of surface area, the internal nasal valve accounts for over 75% of airway resistance. Further collapse may occur during inspiration secondary to Bernoulli’s effect. There are many described ways to address internal valve collapse. At our institution, we classify these methods into cartilage-using or cartilage-sparing techniques. The cartilage-using techniques, simply titled, use cartilage to support or maintain the framework of the valve and prevent collapse during inspiration. This may include alar batten grafts, dorsal spreader grafts, or lateral crural strut grafts. The other classification is cartilage-sparing, which avoids cartilage harvest techniques while still improving the nasal valve diameter. This may include turbinate reduction or suture suspension techniques. At our institution, we offer both techniques to patients. We sought to compare our results over time using nasal valve suspension (NVS) versus alar batten grafting (ABG) for improvement in internal valve obstruction over time.

METHODS AND MATERIALS

Institutional Review Board approval was obtained from UT Southwestern Medical Center for retrospective review of all patients that underwent either nasal valve suspension of the internal valve or alar batten grafting for a primary complaint of nasal obstruction between 2003 and 2013 at the University of Texas Southwestern Medical Center. Postoperative questionnaire included questions regarding symptom scores before and after surgery at first postoperative visit (1 week), 3 months, and current symptom scores (at time of study). The patient was asked to rate their nasal obstruction on a quantitative scale of 1 to 10, with 10 being complete obstruction and 1 being no obstruction. Additional questions asked included complications and patient satisfaction. Patient satisfaction scores were rated as 0-3, with 0 meaning not at all satisfied and 3 being very satisfied. A total of 37 patients completed the questionnaire and had sufficient data for inclusion in this study.

Nasal valve suspensions were performed through a transconjunctival approach and a drill hole similar to the original description by Paniello. A keith needle was passed through the conjunctival incision and tunnelled just above the maxillary periosteum to the level of maxillary internal valve collapse (marked preoperatively). This was passed out then back into the vestibular skin and up through the transconjunctival incision. Periosteum was elevated of a portion of the middle 1/3 of the rim and a small drill hole was made after determining the appropriate vector and hole position. The nylon was then passed through the drill hole and tied to the other end of the suture.

Alar batten grafts were fashioned from septal or conchal cartilage. The grafts averaged 1.2 x 0.5 cm in size and were placed at the level of the internal valve, spanning the caudal upper lateral cartilages and the piriform aperture.

RESULTS

A total of 37 patients underwent either nasal valve suspension (NVS) or alar batten grafting (ABG). Average age was 56 years. There were 21 females and 16 males. Average follow up was 4.6 years for the combined groups.

Alar Batten Graft

There were 15 patients in the ABG group. All patients had bilateral procedures performed for a total of 30 batten grafts. Pre-operatively, patients had an average nasal obstruction rating of 7.2 out of 10. Post-operative scores at 1 week, 3 months, and at the time of questioning were 4.4, 3.1, and 2.8 respectively. Patient satisfaction scores were an average of 2.5 out of 3. Adverse outcomes included epistaxis in 1 patient and unilateral vestibular scar in 1 patient.

Nasal Valve Suspension

There were 22 patients in the NVS group. Fifteen patients underwent bilateral nasal valve suspension procedures for a total of 37 procedures. Average pre-operative nasal obstruction was 7.6 out of 10. Post-operative scores at 1 week, 3 months, and at the time of questioning were 3.5, 3.9, and 5.1 respectively. Patient satisfaction scores were an average of 1.7 out of 3. Adverse outcomes included palpable suture in 1 patient, eyelid deformity in 2 patients, and broken suture in 2 patients.

Comparison of both groups reveals there was no difference between pre-operative (p=0.62) and postoperative scores at 1 week (p=0.23) and 3 months (p=0.56). We did find, however, a significant difference between groups post-operatively at the time of last followup (p=0.02) (figure 2). Patient satisfaction scores were also found to be significantly different (p=0.02), with alar batten graft patients more likely to be “very satisfied”.

DISCUSSION

There is growing awareness that the commonly performed septoplasty with turbinate reduction does not address the main cause of nasal obstruction – internal and external valve collapse. Constantian found that symptoms of nasal congestion only correlated with septal deviation in about half of patients. Alterations in the diameter of the nasal valve can be performed with various maneuvers. In patients undergoing septorhinoplasty with available cartilage for harvesting, options include dorsal spreader grafts, alar batten grafts, butterfly grafts, or lateral crural strut grafts. In patients where cartilage is not readily available or patient preference is to avoid cartilage harvest or septorhinoplasty, other options include turbinate reduction, nasal valve suspension, or flaring suture techniques for widening the nasal valve.

ABG is a highly effective technique that is perhaps the most commonly used technique for treatment of internal valve collapse. A review by Toriumi et al showed a 98% improvement rate in 46 patients at 5 year follow up. Smaller studies have shown improvement with ABG up to 100%. NSV was first described by Paniello in 1996 when he reported a review of 12 patients and determined that NSV was safe and effective. Further reviews of NSV have been mixed and modifications to the technique have been suggested. Friedman reported his series with a modification of Mitek screw and transcutaneous approach with persistent obstruction in only 5 patients, and re-operation in only 2 patients. However, he sites long term follow up as a limitation of the study.

Our results are consistent with those by both groups. We have found alar batten grafting to be reliable in the long term with excellent patient satisfaction scores. The resilience of cartilage seems to compare favorably to permanent sutures which may pull through, migrate, or break over time. Our experience with NYS it that does not achieve the same lasting results or patient satisfaction and a has a higher rate of complications compared to ABG. This difference became significant between 3 months and 4 years.

CONCLUSIONS

There is a multitude of ways to address the internal nasal valve. Although there is not one procedure that is best for every patient, patients that underwent alar batten grafting fared better than their nasal valve suspension counterparts over time. We therefore advocate use of alar batten grafts over nasal valve suspension to address internal nasal valve collapse.

REFERENCES


