
How I Do It
A Targeted Problem and Its Solution

Nasal Valve Suspension: An Improved, Simplified Technique for Nasal Valve Collapse

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INTRODUCTION

Nasal valve collapse is a common cause of nasal airway obstruction. The valve area is commonly weakened secondary to rhinoplasty, aging, trauma, and other causes. The complexity of nasal valve repair techniques and its variable results combined with the fact that patients with valve collapse have often had previous surgery or are of advanced age are some of the reasons that this problem often goes untreated. Often, the problem is not even diagnosed until surgical treatment, such as septoplasty or turbinate reduction, has failed to correct the patient's symptoms of nasal airway obstruction.

Paniello¹ published a preliminary report on 12 patients in which a simplified technique for nasal valve repair was used that involved suspension of the valve to the orbital rim. His technique was shown to be effective in improving the nasal airway. Since 1997, we have used this technique in more than 100 patients with significant modifications that will be described. The modified technique is simpler, safer, and equally effective. It is based on the use of a soft-tissue bone-anchor system that provides a simplified support of the valve area to the orbital rim.

Indication for Surgery

The preoperative evaluation and indications for surgical correction of a collapsed nasal valve have been previously described and are well established. All patients had a positive Cottle maneuver (improved airway on superolateral traction applied to the nasofacial groove). The area of collapse could be identified by intranasal examination at the valve region, and direct superolateral dis-

placement (with a cotton-tip applicator) significantly improved the airway in all patients. Patients with associated rhinitis or other causes of nasal airway obstruction should, of course, be treated appropriately to address these problems prior to surgery. Use of mechanical dilators, such as Breathe-rite strips (Johnson & Johnson), should be offered as a nonsurgical option. It is important to note, however, that in almost all cases, surgical improvement exceeded the improvement with Breathe-rite strips.

Surgical Technique

Although the procedure will be described step-by-step, there are several key points that are important in simplifying the procedure. The equipment, bone anchor, and needle described were chosen after trial and error and have proven to be crucial to the simplicity of the technique. The drill bit is included with the disposable bone anchor set. It fits into the drill shown, which is portable, lightweight, and easy to use. It does not fit into all drill systems. The needle illustrated is the perfect size and contour to allow for easy placement from the orbital rim to the valve area. Substitutions are likely to complicate this important step.

The procedure can be performed under general anesthesia or local anesthesia. The nasal valve area is examined to identify the area of collapse prior to injection of local anesthesia to avoid distortion of tissue. Two points representing the caudal and cephalad margins of the collapsed area are marked. A natural skin crease along the orbital rim is marked (Fig. 1A). Figure 1B illustrates an alternative transconjunctival approach that provides easy access to the infraorbital rim on patients who refuse a facial incision. We have used the external incision in almost every patient, however, with no significant scarring. The incision is so small, and its placement within a natural skin crease makes the external incision the recommended choice. Local anesthesia with epinephrine is then

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Editor's Note: This Manuscript was accepted for publication September 13, 2002.

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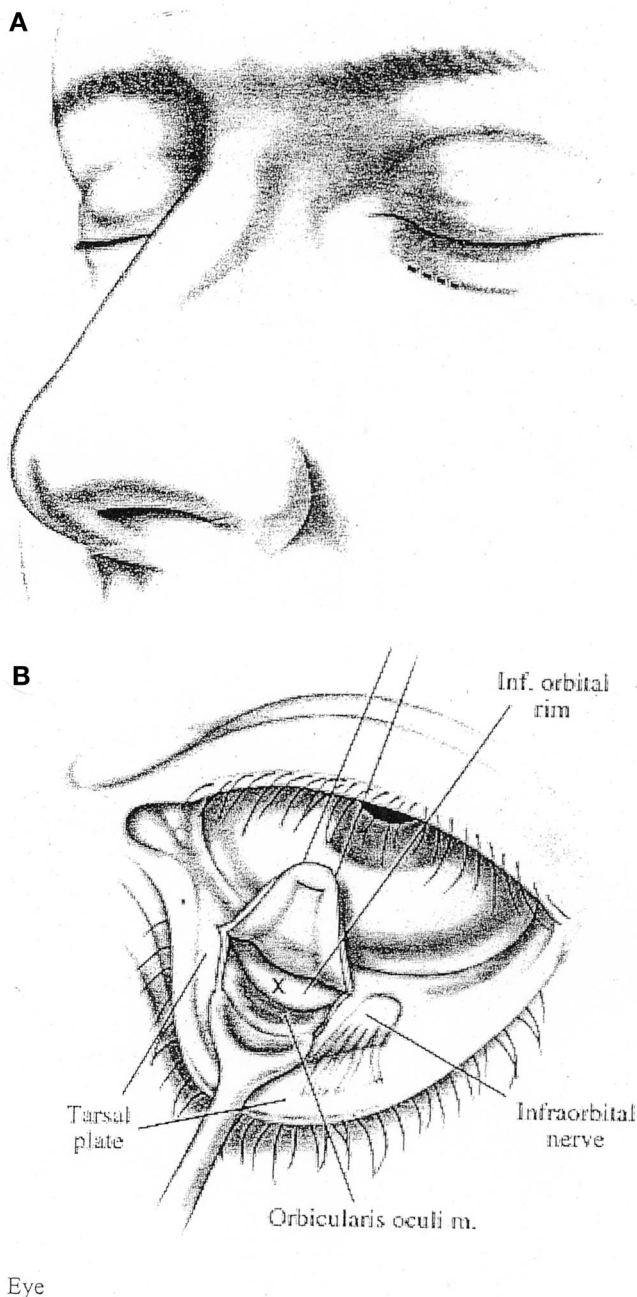


Fig. 1. (A) Incision site: 3 mm placed in skin crease. (B) Transconjunctival incision.

injected into the valve area, along the maxilla, near the infraorbital nerve, and along the orbital rim. A 3-mm incision is made in the medial aspect of the orbital rim. The skin incision is carried down through the periosteum. Rarely is bleeding encountered, but if it is, bipolar cautery is used to control it. The periosteum is elevated away from the orbital rim to expose a 3 × 3-mm area. The Mitek Soft Tissue Anchor system (1.3 mm Micro Quick Anchor; Ethicon), which includes the drill bit, bone anchor, and attached suture, is used to anchor a suture to the orbital rim (Fig. 2A). We have found the battery-operated Stryker

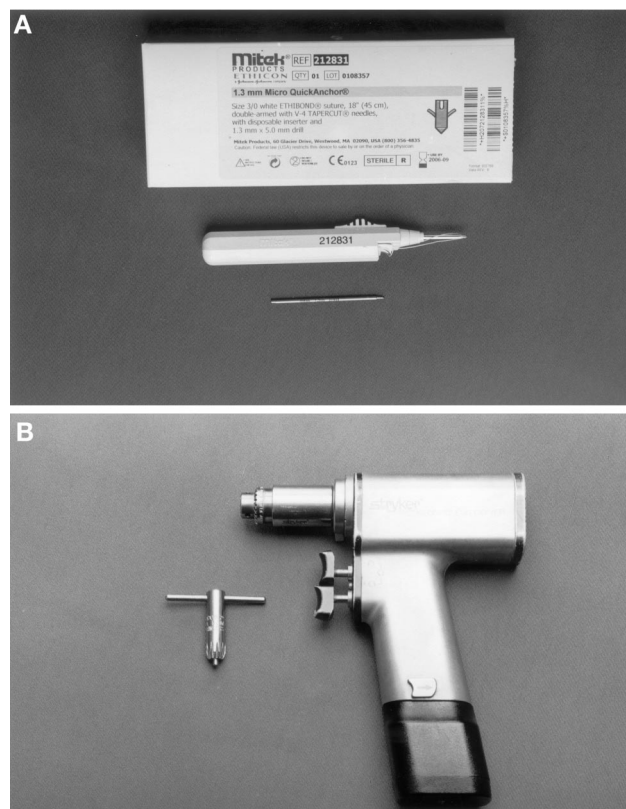


Fig. 2. (A) The Mitek Soft Tissue Anchor applicator (1.3 mm Micro Quick Anchor, Ethicon) is pictured along with the included drill bit. (B) The Stryker drill.

drill accepts the Mitek drill bit and works well in this setting (Fig. 2B). A small drill hole is made into the bone (a drill guide can be used but is not essential; Fig. 3). The Mitek anchor is then easily inserted into the bone. If the drill hole enters the maxillary sinus, the bone anchor can still be used since it is small enough to anchor into relatively thin bone. The bone anchor system is designed to seat the anchor beneath the bone surface so that nothing protrudes above the surface except the suture. The longer end of the suture (3-0 Ethibond; Ethicon) is then passed with a curved needle (Fig. 4) to the nasal valve area and passed through the cephalic point (Figs. 5 and 6). After identifying the collapse site and the intended site of suspension, the needle is then rethreaded and passed from the caudal point toward the anchor (Figs. 7A, B and 8). The suture is then tightened and tied with the proper amount of tension to open the valve but to avoid significant distortion of the external valve area (Fig. 9). The suture is left partially exposed over the nasal valve mucosa but becomes buried over a period of 1 month. The orbital rim incision is closed with Steri-strips. The orbicularis oculi fibers are not sutured to avoid ectropion. Figures 10A, B and 11A, B show preoperative and postoperative views of a single patient. Patients are told to expect some fullness in the nasofacial groove. The vast majority of patients accept this. If they have concerns, they are not candidates for the procedure. The potential for creating this fullness is identified in the classic technique by Paniello and this new, improved technique.

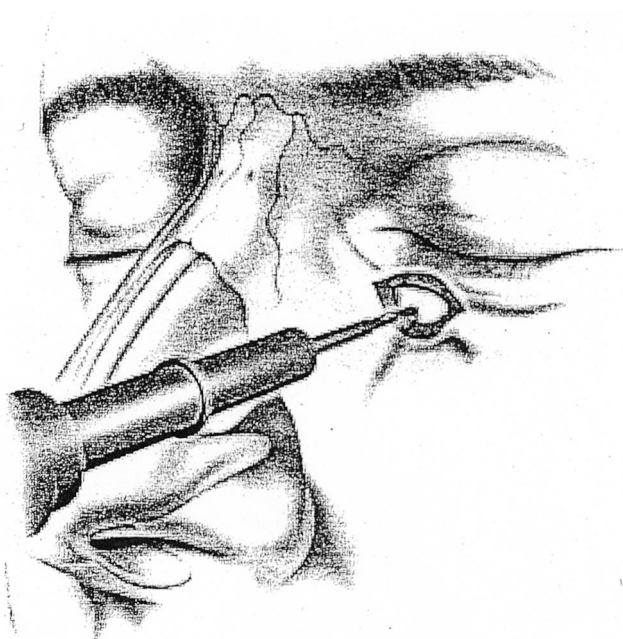


Fig. 3. Medial to the infraorbital nerve and slightly below the infraorbital rim, the anchor site is drilled.

RESULTS

In the initial years, 15 patients (13 unilateral and 2 bilateral) were treated with the technique described by Paniello. One patient had persistent orbital pain that required re-exploration with removal of the suture. All other patients had correction of their nasal airway complaints with no side effects. All had minor changes in their external nasal appearance that were either considered an improvement or inconsequential. Eighty-six patients (56 unilateral and 30 bilateral) were treated with the modified technique. Most of the patients had significantly improved airways. In five patients, persistent partial collapse continued to be a source of obstruction, and two patients underwent re-operation. One patient developed an abscess in the space between the orbital rim and valve area that required incision and drainage. No patient had a scar

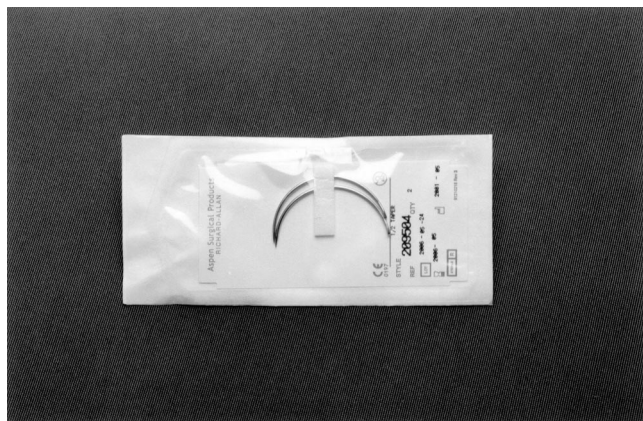


Fig. 4. Richard-Allan (1/2-inch) curved, tapered needle used to pass suture.

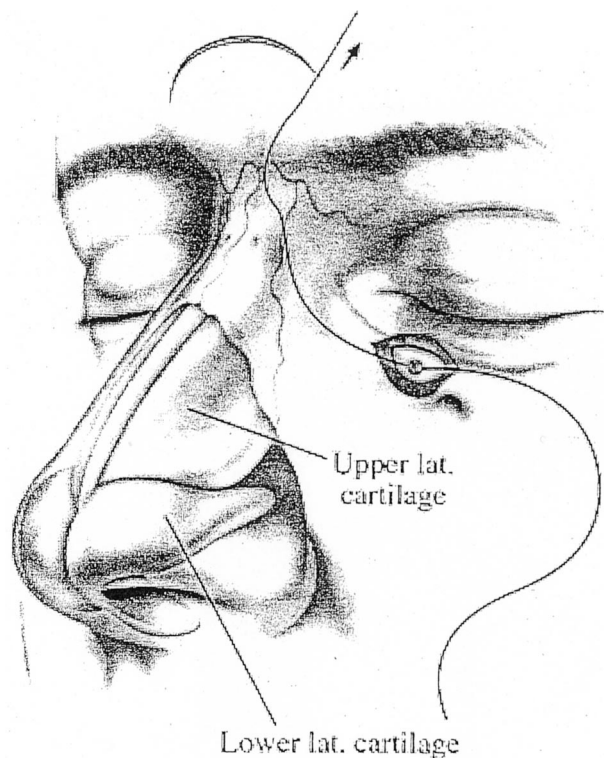


Fig. 5. Anchored suture in place, one side of the suture is threaded through a curved needle.

that he or she considered significant. There is almost always some fullness in the infraorbital area at the level of the bone anchor, which probably represents some reactive

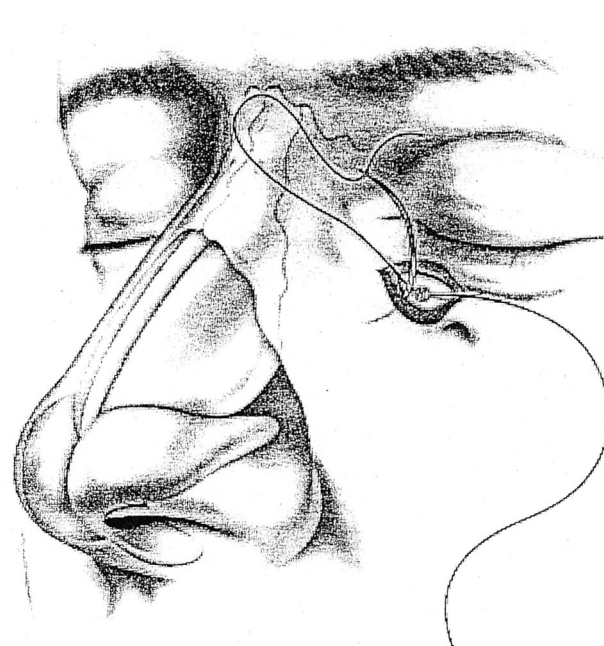


Fig. 6. After identifying the collapse site and the intended sites of the suture suspension, the curved needle is passed through the incision and the subcutaneous tissue into the nose.

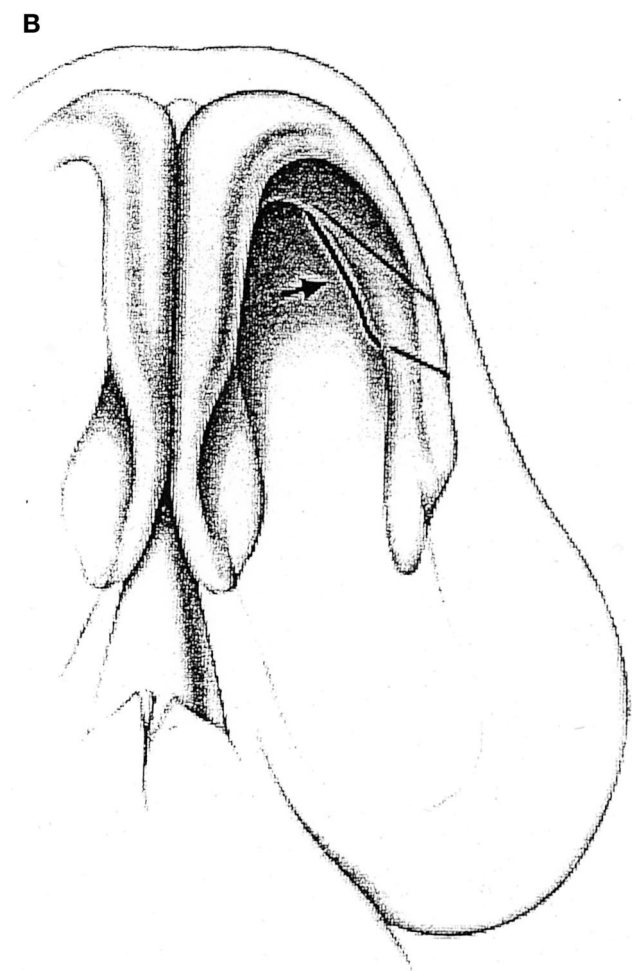
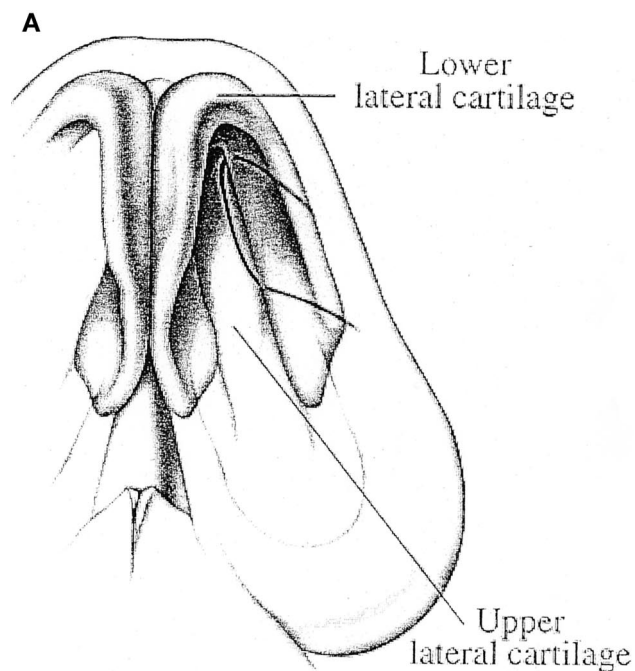


Fig. 7. (A) Prior to tying the suture, the nasal valve is shown in its collapsed position. (B) The nasal valve as it appears after the suspension suture is tied.

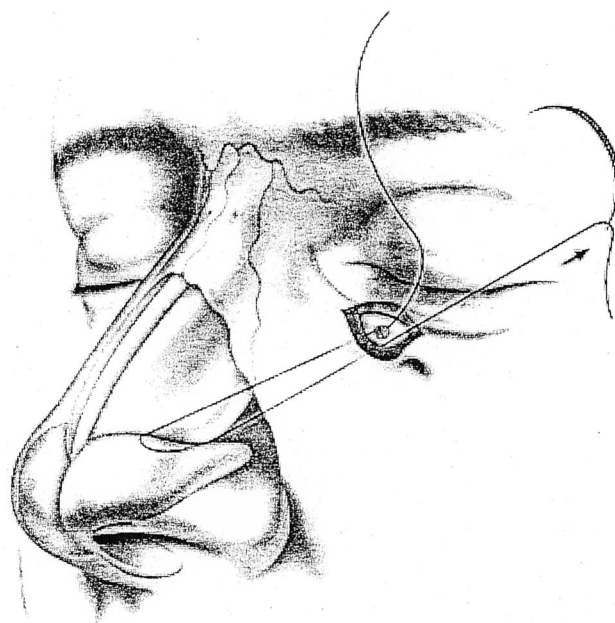


Fig. 8. The suspension suture after it is returned to the incision from the lower suspension site.

scar and swelling. No patient found this to be a significant cosmetic problem.

DISCUSSION

The original technique described by Paniello offers an effective shortcut to correct a complicated nasal problem. The transconjunctival incision and the amount of exposure to drill a hole and to be able to pass a suture through the orbital rim is technically difficult, is time consuming, and requires significant healing time. Paniello demon-

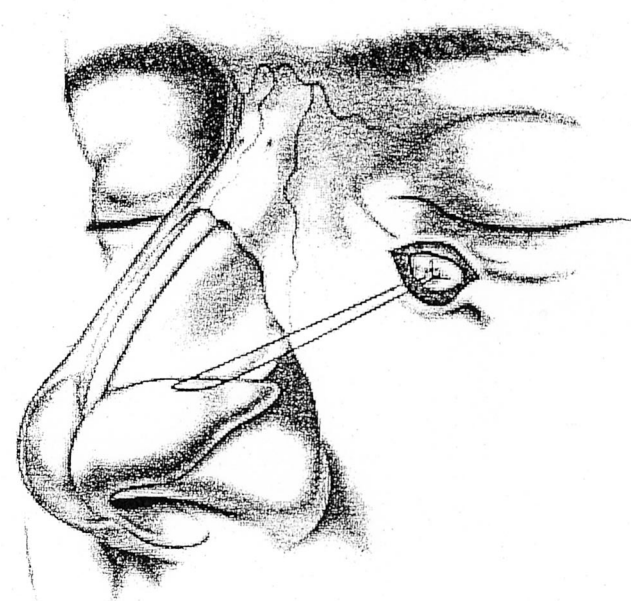


Fig. 9. The suspension suture after tying and prior to skin closure.



Fig. 10. (A) Preoperative (frontal) view. (B) Preoperative (modified basal) view.

strates an alternative technique of fixation to orbital periosteum. Attempts to anchor the suture to periosteum were unsuccessful in our experience. In most cases, suture fixation to the orbital rim periosteum would provide inadequate strength for support. Paniello also describes the use of a screw that would protrude above the bone and is likely to cause postoperative symptoms. The modified technique using a soft tissue anchor takes less than 10 minutes of operating time. There is no significant periorbital edema, and most patients have no postoperative complaints by postoperative day 1. There were few complications noted with the modified technique, and there are three major benefits of the bone-anchor technique. One is the minimal bone exposure required for insertion of the anchor (<4-mm incision). The second is that the anchor is completely buried under the bone surface. The third is the simplicity of the bone-anchor system with attached suture.

This report is designed as a clinical report of a surgical technique rather than a study on treatment of nasal valve collapse. Hence, it is presented as a "How I Do It"



Fig. 11. (A) Postoperative frontal view. (B) Postoperative (modified basal) overhead view showing fullness in the right intraorbital area.

feature. Many questions remain unanswered. The original technique described by Paniello, as well as this one, is based support of a nonabsorbable suture. Our follow-up ranges from 0.5 to 4 years, but most patients were treated in the last year. Long-term results are not available. The distortion noted with Paniello's procedure is also a result of this modified technique. If patients are selected properly, this does not seem to be considered significant by them. In addition, the precise indicators for this procedure are unclear and require further studies. Finally, the basis of result analysis is purely subjective. We are currently adding rhinomanometry studies preoperatively and postoperatively. Despite these deficiencies, the modified technique has helped many patients.

CONCLUSION

A modified technique for orbital suspension to correct a collapsed nasal valve using a soft tissue anchor with attached suture is presented. The technique is simple and effective.

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1. Paniello RC. Nasal valve suspension: an effective treatment for nasal valve collapse. *Arch Otolaryngol Head Neck Surg* 1996;122:1342-1346.