Letters

RESEARCH LETTER

Use of Intranasal Flaring Suture for Dysfunctional Nasal Valve Repair

The nasal valve may be described as the aperture created by the nasal floor inferiorly, upper lateral cartilages (ULCs) superiorly, nasal alar and bony pyriform apertures laterally, and the cartilaginous septum medially.\(^1\) The external and internal nasal valves should be considered separately when assessing the cause of valvular dysfunction, with the most common cause being nasal septal deviation. The next most frequent cause is iatrogenic valvular collapse after rhinosurgery, especially after removal of the nasal roof and overresection of the lower lateral cartilages. Hypertrophy of the inferior turbinates can also significantly increase inspiratory nasal airway resistance. Among many suture and graft techniques used to augment the internal nasal valve angle, one possible solution is using flaring sutures, also known as Park sutures.\(^2\)

**Methods** | A series of patients underwent surgical correction of nasal valve stenosis at the Clinical Hospital Centre Sestre Milosrdnice from June 1, 2012, through May 30, 2014. The last date of follow-up was June 2, 2015. Inclusion criteria consisted of nasal obstruction that had been present for at least 1 year, inspiratory collapse of an otherwise anatomically normal nasal valve, absence of significant septal deviation, and a positive modified Cottle maneuver result. Patients were excluded if they had undergone previous nasal valve surgery and had significant nasal valve area abnormalities, including turbinate hypertrophy or septal deviation, intranasal masses, or infections. The validated Nasal Obstruction Symptom Evaluation (NOSE) scale questionnaire was given to each patient 2 months before and 6 months after the procedure.\(^3\) The study was approved by the Clinical Hospital Centre Sestre Milosrdnice Institutional Review Board, with no conflicts of interest reported. All patients provided written informed consent.

Intranasal flaring sutures were placed in 19 patients while under general anesthesia and 5 patients while under local anesthesia. Bilateral intercartilaginous incisions were made and caudal ULCs were dissected. A single flaring suture using 5-0 clear nylon was placed starting from the caudal lateral portion of the ULC (needle entry point) to the caudal medial part of the ULC dorsally. The needle was pulled through the previously dissected tunnel over the septum and inserted in the caudal medial part and through the caudal lateral part of the contralateral ULC. Finally, the suture was tightened over the nasal dorsum like a fulcrum (Figure 1).

**Results** | This technique was used in 24 patients. On the basis of preoperative and postoperative NOSE scores analyzed by Mann-Whitney and Wilcoxon signed rank nonparametric tests, a statistically significant improvement in nasal blockage and troubled breathing in exercise and sleeping was observed in all the study participants. The longest follow-up is 15 months, and no complications were reported.

**Discussion** | Nasal septal deformities that significantly reduce the internal nasal valve angle can clearly be assessed through anterior rhinoscopy. When a nasal septal deformity contributes to nasal valve insufficiency, the flaring suture can be a useful tool added to septoplasty itself. Even when a septal deviation is present, the flaring suture can still widen the angle of the internal nasal valve and improve air flow, with or without septoplasty (Figure 2). Septal deformities most commonly cause unilateral valve insufficiency, whereas the patients who benefit most from the procedure are the ones with bilateral valve insufficiency. The alar batten and butterfly grafts, alongside novel techniques such as the stairstep graft, are currently most commonly used in nasal valve reconstruction.\(^4,5\) Both the alar and butterfly grafts require septal cartilage or auricular cartilage harvesting and increase potential donor site morbidity. Published studies\(^6,7\) compare the spreader graft and flaring suture positioned through the open rhinoplasty approach. Both techniques provide efficient increase in internal nasal valve angle and a clear improvement in rhinomanometry. The intranasal flaring suture technique is a straightforward and safe procedure that can be performed with the patient under local anesthesia, does not require additional grafting material, and has favorable results in carefully selected patients.

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Figure 2. Endoscopic Intraoperative Images of Nasal Valve Angle Widening

At left, preoperative view; at right, postoperative view.