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MINIREVIEW

ACTUAL SEPTOPLASTY TECHNIQUES

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Abstract

Septoplasty refers to surgical manipulation and/or removal of deviated septal cartilage and/or bone to correct a nasal septal deformity. Up to 90% of people have nasal septal deviations, but the majority is asymptomatic. There are several techniques used when performing septoplasty, the endoscopic ones growing in use because of a better visibility, less complications and faster recovery of the patient. The article shows the different techniques for nasal disobliteration with the main steps and lists the main advantages and disadvantages of this surgery. The main indications for septoplasty are: to correct a deviated nasal septum for irreversible symptomatic nasal obstruction, for improving access for endoscopic sinus or skull base surgery or for removing septal spurs causing epistaxis.

Key words: septoplasty, endoscopy, nasal obstruction.

Résumé

Techniques actuelles de septoplastie

La septoplastie fait référence à la manipulation chirurgicale et / ou au retrait du cartilage septal dévié et / ou de l'os pour corriger une déforestation septale nasale. Jusqu'à 90% des personnes ont des déviations septales nasales, mais la majorité est asymptomatique. Il y a plusieurs techniques utilisées lors de la réalisation de la septoplastie, celles endoscopiques étant de plus en plus utilisées en raison d'une meilleure visibilité, de moins de complications et d'une récupération plus rapide du patient. L'article montre les différentes techniques utilisées pour la désobstruction nasale avec les principales étapes et énumère les principaux avantages et inconvénients de cette chirurgie. Les principales indications de la septoplastie sont les suivantes: correction d'une cloison nasale déviée pour une obstruction nasale symptomatique irréversible, amélioration de l'accès pour la chirurgie endoscopique des sinus ou de la base du crâne ou pour l'élimination des éperons septaux causant l'épistaxis.

Mots-clés: septoplastie, endoscopie, obstruction nasale.

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Introduction

Septoplasty is one of the most common surgery in otorhinolaryngology. It is a surgery that can help breathing and elimination of secretions or is sometimes needed for achieving better visibility during surgery.

History of septoplasty[1]

3500 BC: The Ebers Papyrus, which contains the first known mention of rhinology surgery, was written around this time in Egypt. Most of the procedures depicted in it were reconstructive, because rhinectomy was a frequent form of punishment.
1882: Ingals introduced en bloc resection of small sections of septal cartilage. Because of this innovation, he is credited as the father of modern septal surgery.
1899: Asch was the first to suggest altering the tensile curve of septal cartilage instead of resecting it. He proposed the use of full-thickness cruciate incisions.
1902 and 1904: Freer and Killian described the submucous resection (SMR) operation. This procedure is the foundation of modern septoplasty techniques.
1947: Cottle introduced the hemitransfixion incision and the practice of conservative septal resections.
1991: Lanza & Stammberger initially described the application of endoscopic tehniques to the correction of septal deformity.

Indications for septoplasty are[2]: septoplasty may be required to correct a deviated nasal septum for irreversible symptomatic nasal obstruction, improving access for endoscopic sinus or skull base surgery or septal spurs causing epistaxis.

Surgical approaches

Septoplasty must achieve[3]: separation of the left and right nasal cavities, adequate nasal air flow and should preserve dorsal and tip support of the nose. It is the authors' preference to do the surgery endoscopically, due to the excellent visibility it allows. Surgery may also be achieved with an operating microscope or with a headlight and nasal speculum. Non-endoscopic surgical approaches may include endonasal (+/-microscope), external rhinoplasty, alar release and midfacial degloving techniques. If an endoscopic technique is not used, access to the nasal septum can be restricted.

Killian approach – Surgical Steps:[7]

Decongest both sides of the nose with pledgets soaked in 1:1000 epinephrine, or alternatively, pseudoephedrine. After several minutes, inject lidocaine with epinephrine in submucoperichondrial planes bilaterally. Incise the mucosa approximately 5 mm anterior to the intended transcartilagenous incision. Extend the incision up to the muco-perichondrial junction, taking care not to score the underlying cartilage and as superiorly as possible. Use a Cottle elevator to develop a sub-mucoperichondrial flap via the incision. Elevate a flap, while stripping in a semicircular fashion, starting in a postero-superior direction. Take care to remain within the well-defined subperichondrial/subperiosteal plane, until you encounter the dense fibrous attachments to the maxillary crest. Control bleeding with intermittent suction and epinephrine-soaked pledgets. With the ipsilateral flap elevated beyond the septal deviation, make a transcartilaginous incision, 1-2 mm posterior to the original mucosal incision, with an angled blade or by scoring the cartilage with the blade and then using a Cottle elevator, to complete the cartilage incision. Preserve dorsal and caudal cartilage struts of >1 cm for nasal and tip support. Once both flaps have been fully elevated, use a swivel knife or scissors to remove part of the quadrangular cartilage; save the cartilage to later replace it. Use a through-biting punch to remove bone above the deflection, to separate the deflection from its attachment to the skull base, taking care not to twist the vertical plate of the ethmoid, to avoid inadvertently fracturing of the cribriform plate. Once the deflection has been separated from the skull base, reflect remaining mucosal attachments around the deflection and carefully fracture and remove remaining bony deflections with grasping forceps. If a deflection involves the maxillary crest, elevate the mucosa along the floor of the nose in a posterior to anterior direction. When the mucoperichondrial flaps are closed, use a 4-0 plain catgut suture on a Keith needle to close both the incision and to coopt the mucoperichondrial flaps with a quilting stitch. Splints are optional following quilting, although they may promote healing and reduce the risk of a septal haematoma.

Pastorek and Becker's modified swinging door technique for treatment of the caudal septum[8]:

The septal cartilage along the maxillary crest is dissected free, but not excised. Instead, the caudal septum is flipped over the nasal spine, which acts as a „doorstop" and secures the caudal septum in a straighter position.

Endoscopic septoplasty techniques [9-12]:

All endoscopic techniques should start with diagnostic endoscopy. After packing with lidocaine/naphazoline to retract the mucosa, diagnostic endoscopy is performed to analyse all of the deformities of the septum and to plan the subsequent surgical repair. Subperichondral infiltration with lidocaine and 1% adrenaline limits intraoperative bleeding and

initiates hydrodissection. Infiltration generally starts in the posterior part of the septum and then ascends to the anterior part of the septum. Both the superior and inferior parts of the septum are injected, as far as the floor of the nasal cavity, to facilitate dissection of the maxillary crest. Both surfaces of the septum are infiltrated before incision.

The mucosal incision is systematically performed in the left nasal cavity (for a right-handed surgeon). This very anterior arc-shaped incision passes anteriorly to the deviation of the maxillary crest inferiorly (and can even be prolonged on the floor of the nasal cavity), and is then continued superiorly and posteriorly beyond the plica vestibuli, underneath the nasal bones (in order to create a large operative cavity and to facilitate endoscopic navigation inside this cavity). The position of this incision is important and represents one of the major difficulties of the operation. If the incision is placed too posteriorly (which is sometimes the case during the learning phase of this endoscopic technique), anterior deviations of the septum will not be corrected. The left septal surface is dissected in the subperichondral plane using a Cottle elevator, as far as the chondro-vomerine junction. The cartilage incision is performed with a no. 15 scalpel blade, about 0.5 cm posteriorly to the mucosal incision. This small strip of cartilage will be used as a support for the mucosal flap at the time of closure. A Cottle elevator is used to find the plane of dissection. In the subperichondral plane in the right nasal cavity, the flap is detached as far as the chondro-vomerine junction. The inferior part of this junction is then delicately dislocated.

A strip of anterior cartilage, about 2 cm long, extending as far as the vomer posteriorly, is resected. When resection is performed with scissors, there is a risk of accidental section of the left nasal cavity mucosal flap. The superior section must therefore be performed very cautiously, possibly with retraction of the mucosal flaps by using a self-retaining Killian speculum. Resection of this strip of cartilage allows clearer visualization of the posterior and inferior part of the septum, by creating a large operative cavity for endoscopic navigation. Posterior dissection is continued subperiosteally as far as the vomer and perpendicular plate of the ethmoid. Bone section is performed with Mayo scissors in the middle part of the bony septum, to prevent an irradiated fracture to the skull base during resection of the maxillary crest with a nasal gouge.

Resection of the maxillary crest is performed systematically, in order to thin the septum and increase the dimensions of the inferior nasal airway. Subperiosteal dissection starts posteriorly, as the maxillary crest is often straighter at this point, and is continued anteriorly. The anterior nasal spine of the maxilla is exposed and the maxillary crest is resected with a nasal gouge. The septa mucosal flaps are reapplied and endoscopy of the nasal cavities is performed in order to detect any residual septal deformities that can then be resected as required. The incision is closed with 1 or 2 Vicryl®rapid 4/0 sutures.

Other types of incision for endoscopic septoplasty: [13,14]

- caudal to the most deviated portion;
- at the spur inferiorly – in case with isolated spur;
- modified incision technique by Lanza et al – an incision placed parallel to the floor of the nose on the apex of the spur.

Complications of septoplasty:[15,16]

All types of septoplasty have the following risks: septal haematoma, epistaxis from raw mucosal edges, septal perforation, bilateral, opposing mucosal tears, excessive packing, nasal obstruction, inadequate correction of septal deformity, synechiae from opposing, traumatised septal and inferior turbinate mucosal surfaces, nasal deformity from excessive removal of cartilage and preserving too little dorsal or caudal cartilage struts.

Conclusions

Initial diagnostic endoscopy is essential to correctly evaluate the septal deviation. The mucosal incision must be sufficiently anterior to allow wide access to the deformity. Resection of an anterior strip of cartilage allows good visualization of the operative field. Complementary resection of bone and cartilage and the maxillary crest can be performed depending on the characteristics of the deviation. Revision endoscopy is performed to ensure good patency of the nasal airway.

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