

Indications and Contraindications for Septoplasty in Children

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Problems related with nasal obstruction in children and adults have always been reason for concern. It is known that during the growth period mouth breathing in children may lead to severe physical developmental disorders (facial, oral, nasal and thoracic), which may potentially lead to cognitive impairment. In adults, it hinders quality of life, leading to fatigue during physical exercises and favoring the onset of snoring and sleep apnea.

There are many affections or diseases that lead to nasal obstruction in children, and nasal septum deviation is one of them.

Grey and Fairbanks assessed the incidence of septal deviation in different age ranges: from 58% of newborns, (including 4% with associated cosmetic affections), to between 73 and 83% of the in adults, even so, not all of them require surgical correction.

A child with septal deviation can have other diseases or associated obstructive affections such as adenoid hypertrophy, nasal conchae hypertrophy, choanal atresia, foreign bodies, cystic fibrosis, nasal polyposis, and mucoviscidosis. All these factors should be excluded so that we can safely indicate septoplasty in a child. Based on history and physical examination it is possible to come up with some diagnostic hypotheses (anterior septal deviation, nasal conchae hypertrophy, allergic rhinopathy). To support or refute these hypotheses we can make use of plain X-ray, which is still useful, flexible or rigid nasofibroscopy and computed tomography scan (CT).

There is a constant unanswered question, though: what is the percentage of pathological nasal obstruction in children, caused exclusively or primarily by structural nose malformations, that requires surgical treatment?

Upon reviewing the literature on the topic, the most complete and sensible summary, whose conclusion we agree, is the paper wrote by Scott C. Manning, named "A 3 year-old child with a severely deviated septum and airway obstruction", which we quote below:

"Conservative submucoperichondral septoplasty, with maximum replacement of cartilage, is indicated. It is a reasonable approach to a pediatric patient with unilateral or bilateral complete nasal obstruction".

According to Manning's experience, severe septal deformities with significant nasal obstruction are rare findings in patients in this age range. The most

common cases are patients with history of trauma, who develop progressive nasal obstruction upon growth. If they reach complete symptomatic obstruction and/or ipsilateral sinusitis, Manning recommends conservative septoplasty.

The performance of septoplasty in children has always been a very controversial topic, full of assumptions. Let us point out some:

- 1) the existence of a nasal growth center in the contact area between the quadrangular cartilage and vomer;
- 2) improper development of the nose and face, such as high palate, malocclusion, etc;
- 3) effects of nasal trauma on nasal and facial growth.

Let us analyze the **first** assumption: the existence of a nasal growth center in the contact area between the quadrangular cartilage and vomer.

As mentioned by Adolfo Colomo in his chapter on septoplasty in children, in the III IAPO's Manual of Pediatric Otorhinolaryngology 2003, there has been no certain histological demonstration of nasal growth centers in the cartilage and septal bone.

As to the **second** assumption, Huizing, in 2003, published an article about the development of bone-cartilaginous septum, described as being formed mainly of cartilage, which does not develop with age, meaning that the growth of nasal septum is due to bone growth, which pushes the cartilage forward and upwards, projecting the nasal pyramid.

There are three major periods of nasal growth: during the 2nd, 4th and 11th-12th years of life.

Moreover, the development of the face and nose is not only due to growth of nasal septum, but it also depends on other factors such as breathing, dentition, brain development, facial and pharyngeal muscle development and connective tissues growth.

As to the **third** assumption, it is known that nasal trauma of any kind may cause affections to the development of the nose and face, which may eventually manifest years later.

Nasal plain X-ray of children below the age of 5 or 6 years is rarely beneficial. It is better to examine a photo, if available, and clinically assess (palpate) the nasal bones, in special the cartilage, to detect fracture, luxation, and hematoma that can be corrected as early as possible. The child should be closely followed up because abscesses and hematomas can be formed within one to two days. Follow up of children after trauma to the face or nose should be performed after 24, 48 and 72 hours of the accident.

What should be done when there is nasal fracture with septum and/or nose deviation and luxation? We should necessarily operate on the patient and reposition the nasal pyramid bones, in addition to correcting the septum deviation.

The surgical indication of septoplasty in pediatric patients depends on failure of appropriate clinical treatment, if indicated. In addition, we should always consider the cost-benefit ratio to prevent further damage to the child.

The surgical indications are:

- severe nasal breathing obstruction caused by severe septal deviation;

- improper development of nose and face caused by severe septal deviation;
- acute nasal trauma leading to septal and/or nasal pyramid deformities;
- hematoma or nasal septum abscess.

Which are the recommended surgical techniques?

Techniques should be individualized in all cases, according to patient's age and affection.

Septoplasty, according to age range, comprises:

- repositioning of the septum in newborn (0-4 months);
- very conservative subchondral and subperiosteal septoplasty (according to Cottle or Metzenbaum) in children aged 5-12 years, including endoscopic control. We can also perform septoplasty with endoscopic control and use of bone deviations (avoid removing bone that can not suffer remodeling);
- Classical septoplasty by Cottle in children aged over 15-16 years;
- other techniques such as sublabbial and open rhinoseptoplasty only in special trauma cases and severe nasal deformities.

In the newborn, manipulation should be made using blunt and very delicate instruments to reposition the nose and the septum. Clinicians should also encourage parents to use a milk bottle, because the orbicularis oris muscle movement in suction can move the anterior portion of the nasal cartilage, which is very important for appropriate septal development.

In pediatric septoplasty, the most important element is to maintain the contact of all small parts that will remain in the nasal septum, specially the contact between the cartilage, vomer and perpendicular lamina.

Another aspect to be considered is septal stabilization. A plastic support (splint) should be introduced to fix the septum in the correct position and to maintain the nasal valve area constantly open.

Conclusion

It is necessary to perform a comprehensive assessment of anatomical-functional advantage and growth characteristics before performing septoplasty in children. When nasal obstruction is caused by nasal septum deviation, it can and should be conservatively treated.

Nevertheless, in our experience, we have never had to operate on children below the age of six years.

Recommended readings

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