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Is there a future for pediatric sinus surgery? An American perspective

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Abstract

The role of pediatric sinus surgery in chronic sinusitis continues to evolve. By the early 1990s, endoscopic sinus surgery was being touted as a primary intervention of chronic pediatric sinusitis. Around this same time these endoscopic techniques were being attempted in congenital nasosinus malformations, acute orbital complications of sinusitis and other areas. In 1996, the Brussels consensus paper on pediatric sinusitis recommended that the latter set of nasal disorders was "absolute" indications, and ironically, chronic sinusitis was a "possible indication". This report reviews some of the changes which have impacted the use of sinus surgery during the last decade including the perception of nasal symptoms during the era of antibiotic resistance in bacteria, improved instrumentation, the role of adenoidectomy, research on the effects of sinus surgery on facial growth, and the research on surgical outcomes.

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In the last 30 years, the techniques of endoscopic sinus surgery have developed as the primary surgical approach to nasal and sinus problems. One of the primary themes behind this technique has been the reestablishment of physiological paranasal sinuses. Of all of the disorders of the nose and sinuses, chronic sinusitis appeared to be the most likely problem, which could be treated by implementing this technique.

In children, the trend of endoscopic sinus surgery seemed to follow a similar pattern behind adult surgery. As in any approach in pediatric patients, the first surgeons in this area were quite conservative. However, by the early 1990s surgeons were promoting

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endoscopic sinus surgery in two new areas. First, the surgeons were using the techniques in areas other than chronic sinus surgery. Initially, the endoscopic approach to orbital complications of acute sinusitis was viewed with trepidation. However, this procedure and similar advances, such as approaches to angiofibroma, CSF leaks, and meningoceles were becoming more common. Second, the age of the patient was lowered into infancy. The use of endoscopic sinus surgery for "chronic sinusitis" in toddlers was greeted with much skepticism because of the difficulties making an accurate diagnosis of chronic sinus disease in an age group confronted by frequent viral respiratory infections. Endoscopic sinus surgery was following the route of so many techniques in that there was a rapid expansion in its use until we realized the limitations of its value.

In 1996, a group of specialists concerned with sinusitis met in Brussels and created a consensus document [1]. Ironically, the experts wrote that "absolute indications" for sinus surgery included those areas in which endoscopic sinus techniques were employed secondarily as extensions of the technique such as access to the orbit or base of skull. The use of endoscopic sinus surgery in children with chronic sinusitis was considered a "possible indication" to be used in a small fraction of children who failed maximal medical management. It seems as though the limits of this technique in pediatric sinus surgery were being realized.

During this decade, there were a number of important advances, which have helped change the role of sinus surgery in pediatric chronic sinusitis. These included a change in the perception of the importance of aggressively treating sinusitis, a resurgence of interest in the role of adenoidectomy, the role of better instrumentation, research in the area of facial growth following sinus surgery, and research in the success rates of this procedure. The rest of this paper will address each of these areas and the impact on the management of pediatric sinusitis.

Perhaps the most important change in the last 10 years in this area is the perception of pediatric nasal symptoms by the public and primary care doctors. Prior to this time, the use of broad-spectrum antibiotics for rather minimal nasal symptoms in children was widespread. In the early 1990s, concern escalated about the rapidly emerging resistance in respiratory pathogens. Primary care physicians have dramatically changed their approach with education and observation being the first step in upper respiratory infections. Referrals to otolaryngologists decreased especially in the younger age groups. The United States followed the lead of other countries in family education and monitoring upper respiratory illness instead of aggressive management.

The role of adenoidectomy in treating nasal symptoms has been supported by at least three papers [2-4]. Ramadan [5] demonstrated benefit from adenoidectomy, but showed higher success rates with endoscopic sinus surgery. In our own practice, we frequently will employ adenoidectomy as the first line of surgical management. In younger children, the diagnosis of chronic sinusitis can be very difficult to discern from allergic rhinitis and viral respiratory illness. The costs of allergy testing and CT scans with sedation as diagnostic tools are not insignificant. We will frequently circumvent the diagnostic quagmire and use adenoidectomy in children with rhinorrhea and nasal obstruction as the first line treatment.

In those children who fail to benefit from adenoidectomy and continue to have symptoms, we will pursue allergy testing, immune function testing, and CT scan imaging of the sinuses. A child who meets the criteria of chronic sinusitis by history and has significant disease on the CT scan will be a candidate for sinus surgery. The use of improved instruments including the through-cutting forceps and the microdebrider has improved surgical precision. In previous years, the surgery commonly involved stripping mucosa and performing sphenoethmoidectomies. Nowadays, the surgery is frequently limited to improving the patency of the maxillary ostia and anterior ethmoidectomy.

In the mid-1990s, two studies involving piglets demonstrated significant changes in facial growth following sinus surgery [6,7]. Subsequently, two papers involving humans suggest that the risk of sinus surgery in humans is less substantial [8,9]. Bothwell et al. compared two cohorts who had either sinus surgery or medical management at a young age. The patients were brought back after 10 years and evaluated by anthropometric measurements, which demonstrated no difference from normals. The two groups were also examined by a facial plastic surgeon who could discern significant subjective facial changes. We believe the data suggest that sinus surgery in any children has not significantly altered their facial growth.

Lastly, there have been numerous studies which look at the success rates of endoscopic sinus surgery. The meta-analysis by Hebert and Bent [10] reviews the best of these studies and suggests that sinus surgery for chronic sinusitis achieves treatment goals in about 88%. Similar results were seen in all of these studies. Unfortunately, the studies tend to use retrospective data with no control groups and results based on nonvalidated questionnaires.

In summary, the role of endoscopic sinus surgery in the treatment of pediatric chronic sinus surgery is still evolving. The technique appears to be safe and without long-term ill effects. Its indications and benefits in various age groups are still being determined. Adenoidectomy is a reasonable alternative as a first step in young children with nasal symptoms.

References

- P.A.R. Clement, et al., Management of rhinosinusitis in children, Int. J. Pediatr. Otorhinolaryngol. 49 (1995) 95–100.
- [2] R.M. Rosenfeld, Pilot study of outcomes in pediatric rhinosinusitis, Arch. Otolaryngol. Head Neck Surg. 121 (1995) 729-736.
- [3] H. Takahashi, et al., Effect of adenoidectomy on otitis media with effusion, tubal function, and sinusitis, Am. J. Otolaryngol. 10 (1989) 208-213.
- [4] S.J. Vandenberg, D.G. Heatley, Efficacy of adenoidectomy in relieving symptoms of chronic sinusitis in children, Arch. Otolaryngol. Head Neck Surg. 123 (1997) 675–678.
- [5] H.H. Ramadan, Adenoidectomy vs. endoscopic sinus surgery for the treatment of pediatric sinusitis, Arch. Otolaryngol. Head Neck Surg. 125 (1999) 1208–1211.
- [6] K.M. Carpenter, et al., Facial skeletal growth after endoscopic sinus surgery in the piglet model, Am. J. Rhinol. 11 (1997) 21–27.
- [7] E.A. Mair, et al., Sinus and facial growth after pediatric endoscopic sinus surgery, Arch. Otolaryngol. Head Neck Surg. 121 (1995) 547–552.
- [8] M.R. Bothwell, et al., Long-term outcome of facial growth after functional endoscopic sinus surgery, Otolaryngol. Head Neck Surg. 126 (2002) 628-634.
- [9] B. Senior, et al., Quantitative impact of pediatric sinus surgery on facial growth, Laryngoscope 110 (2000) 1866–1870.
- [10] R.L. Hebert II, J.P. Bent III, Meta-analysis of outcomes of pediatric functional endoscopic sinus surgery, Laryngoscope 108 (1998) 796–799.