Editorial

Endoscopic sinus surgery in acute and chronic pediatric rhinosinusitis

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Acute and sub acute rhinitis in young children and rhinosinusitis in older children are commonly seen in childhood, with symptoms and signs that may significantly vary from child to child. Indeed, children experience an average of six to eight colds per year, with 0.5-5% of them being complicated by acute sinusitis.[1] In addition, chronic rhinosinusitis may also cause significant morbidity to children, and affect their everyday quality of life.[2]

Rhino-sinusitis responds to medical treatment in most children. Children who fail to respond to medical treatment could be considered as candidates for surgical management to control their symptoms, prevent potential complications, and improve their quality of life.[3] Hence, the fact remains that some children, who do not respond to medical treatment, will be referred to the Otorhinolaryngologist, who, in turn, faces the problem of what to recommend.

Part of the problem is lying upon the discrepancy in opinions between Otorhinolaryngologist and Pediatricians, regarding the indications for sinus surgery, especially in chronic cases, which can be frequently, summarized in the quote "in chronic sinusitis every effort should be made to avoid operative procedures".[4] This discrepancy necessitates the least possible variance in the proposed treatment plan by the Otolaryngologist, and his/her adherence to the principles of evidence-based medicine in this domain also, disregarding any dogmatic views.

With regard to acute rhinosinusitis, endoscopic sinus surgery is usually reserved for the management of pending or existing complications. Osteomyelitis of the anterior frontal plate (Pott's puffy tumour) represents such a condition, and should be managed in the majority of cases with an endoscopic frontal sinusotomy (Draf 2a). The procedure should include uncinectomy and middle meatal antrostomy, and complete anterior and posterior ethmoidectomy using the lamina papyracea and skull base as landmarks. The agger nasi as well as any frontal sinus cells obstructing the frontal recess should also be removed.[5] Neurosurgical intervention for the drainage of a co-existing intracranial abscess should be performed in the same session as the endoscopic nasal drainage, when possible.[5]

Orbital complications represent the most frequently encountered complications of acute rhinosinusitis, appearing approximately twice as often as the intracranial ones, and followed by osseous involvement (osteomyelitis).[6] Surgical intervention, preferably endoscopic, is advocated in cases of documented subperiosteal or intraorbital abscess, reduced visual acuity or color vision, affected afferent pupillary reflex or inability to assess the child's vision. In addition, progressing or not improving orbital signs (diplopia, ophthalmoplegia, proptosis, swelling and chemosis) after 48hours of intravenous antibiotics, or even progressing or not improving general condition of the child during the same time period also represent indications for prompt surgical exploration and drainage.[6]

The procedure usually includes uncinectomy and middle meatal antrostomy, and anterior ethmoidectomy. Skeletonization of the lamina papyracea following probing, and drainage of the subperiosteal or intraorbital pus collection are also required in case of respective abscess formation. By contrast, surgical drainage could be withheld in children aged between 2-4years old or less with small (< 0.5-1ml in volume) medially located subperiosteal abscess, demonstrating clear clinical improvement within 24-48hours of intravenous antibiotics, no decrease in visual acuity, and no significant systemic involvement.[7]

As far as chronic rhinosinusitis is concerned, it has become clear in the modern era of endoscopy and imaging that rhinitis and adenoid hypertrophy are not the only reasons of a runny nose in children, as in the majority of cases the sinuses are involved as well. Hence, chronic rhinosinusitis may often be overlooked. Irrespective of difficulties in diagnosis associated with the variability in the clinical presentation of chronic pediatric rhinosinusitis, and/or the frequent inability of children to reliably describe their exact symptoms, chronic rhinosinusitis may have a serious impact on children's quality of life, and their respective health status.

It is widely agreed that medical therapy is the mainstay of treatment in pediatric chronic rhinosinusitis. Optimal conservative management includes 2-6weeks of adequate antibiotics with treatment of any concomitant disease. Cases refractory to the aforementioned optimal conservative management (and after systemic disease has been excluded) may be subjected to endoscopic sinus surgery as a reasonable alternative to continuous medical treatment.[8]

There are also absolute indications for performing endoscopic sinus surgery in pediatric chronic rhinosinusitis. Complete nasal obstruction in cystic fibrosis due to massive polyposis or medialisation of the lateral nasal wall, the presence of an antrochoanal polyp, the existence of mucocoele/mucopyocoele, or cases of fungal rhinosinusitis.[8]

Endoscopic sinus surgery in pediatric rhinosinusitis is mostly limited to a partial ethmoidectomy. The uncinate process is removed,

with or without a middle meatal antrostomy, and the ethmoidal bulla is also opened.[9] A more extended surgery is usually not superior to a limited approach (infundibulotomy);[10] hence, a conservative approach may be adopted in most pediatric cases. In addition, when a decision is made to proceed with endoscopic surgery in children with chronic rhinosinusistis, an adenoidectomy should also be performed, especially if the child is older than 6years of age, shows high Lund-Mackay CT score, suffers from asthma, and resides in an environment exposed to cigarette smoking.[3]

Yet, pediatric endoscopic surgery is a surgical intervention, and, as in all procedures in the human body, there are potential risks involved. Hence, appropriate preoperative informed consent requires that the patient and parents are aware of the potential risks associated with this specific type of surgery. These risks should be weighed against the fact that children with chronic rhinosinusitis warranting surgical treatment have a significant chronic illness.[11] The nasal congestion, the purulent nasal discharge, the postnasal drainage, and the recurring headache inevitably affect the children's physical and emotional well-being, and thus their quality of life.[2]

With regard to the concerns about the potential impact of endoscopic surgery on facial growth, triggered in part by animal experiments,[12] both quantitative anthropomorphic and qualitative facial analyses conducted by Bothwell et al in children who had undergone endoscopic sinus surgery, showed no statistical significance in facial growth compared to those who had not, after a mean follow up period of 13.2years.[13] In addition, despite the relative underdevelopment of the pediatric sinuses, and the proximity of the operated areas to noble structures (i.e. orbit, optic nerve anterior cranial fossa), pediatric endoscopic sinus surgery can be overall considered as a safe procedure. A recent meta-analysis reported a 0.5% rate of major complications in pediatric endoscopic sinus surgery, none of which proved fatal, or irreversible. The respective rate of minor complications had not exceeded 2%.[2]

As a closing remark, it is should be mentioned that the concept of "performing the same procedure in a smaller patient" for pediatric endoscopic sinus surgery is not correct on its own merits. This should especially be considered in cases of pediatric chronic rhinosinusitis. Strict inclusion criteria in accordance to the principles of evidence-based medicine are warranted, taking also into account the limitations related to the patient and/or the surgeon, to accomplish optimal patient management without unnecessary increases in iatrogenic morbidity.

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Conflicts of interest

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