

Endoscopic sinus surgery for nasal polyps in children: Results*

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SUMMARY

Functional endoscopic sinus surgery (FESS) was performed on 21 children with nasal polyps, who had a total of 34 operations, on 65 sides. Retrospectively, we reviewed the pre-operative symptoms, pre-operative findings and results of FESS. The diagnoses were made with anterior rhinoscopy and CT scan. Allergy could be confirmed in 24%. Half of the children (52%) had been previously operated on because of nasal polyps. They had more recurrences and worse results than children who underwent primary FESS. The subjective results were good in 77% with a mean follow-up of more than two years. However, a poor correlation between subjective and objective results was noted. Minor complications were seen in 9.2% of 65 sides operated on. The specific advantages of FESS in children are discussed.

Key words: functional endoscopic sinus surgery, nasal polyps, children

INTRODUCTION

Functional endoscopic sinus surgery (FESS) has gained in importance in the treatment of nasal polyposis in adults; long-term results are considered to be good (Dale, 1989; Vleming et al., 1991). Recently, the application of FESS in children - mainly children with chronic sinusitis - has been reported (Gross et al., 1989; Lusk and Muntz, 1990; Duplechain et al., 1991; Kuttner et al., 1992; Lazar et al., 1992; Triglia et al., 1992).

Nasal polyposis (NP), however, is another condition in children for which FESS can be used. NP is rare in children and is often associated with cystic fibrosis, primary ciliary dyskinesia, aspirin-intolerance and chronic obstructive pulmonary disease (COPD). Data on an association between allergy and NP are inconclusive. In this paper, we report on a group of children with NP treated with FESS.

MATERIAL AND METHODS

From January 1986 until January 1992, 21 children with NP (no antrochoanal polyps) underwent FESS - 34 operations in total - at the Free University Hospital in Amsterdam, The Netherlands. The 21 children, 11 girls and 10 boys, ranged in age between 6 and 18 years (mean: 13.5 years). The complaints the children presented themselves with, are listed in Table 1. In 67% the complaints had been present for at least five years. Prior to surgery 57% was treated with a corticosteroid nasal spray. Previous ENT-operations are listed in Figure 1.

Table 1. Pre-operative complaints and pre-operative findings of ENT- and physical examination.

complaint	number	finding	number
nasal obstruction	21 (100%)	polyps (rhinoscopy)	17 (81%)
rhinorrhoea	19 (90%)	rhinorrhoea	12 (57%)
persistent coughing	12 (57%)	open-mouth breathing	11 (52%)
headache	12 (57%)	septal deviation	7 (33%)
smelling disorder	9 (43%)	post-nasal drip	4 (19%)
snoring	6 (29%)	nasal speech	3 (14%)
ear complaints	6 (29%)	nasal deformity (broadening)	2 (10%)

Co-existing diseases

Ten children (48%) had a co-existing disease which was associated with NP (Table 2). One girl with asthma suffered from the ASA-triad: asthma combined with acetylsalicyl-acid sensitivity and nasal polyps (Jantti-Alanko et al., 1989). In a 7-year-old boy Woake's syndrome has been diagnosed. This syndrome consists of massive recurrent NP in young children, which causes broadening of the nose and is associated with bronchiectasis (Wentges, 1972; Abbud-Neme et al., 1987).

Examination

Pre-operative nasal endoscopy and/or anterior rhinoscopy was performed in all children (Table 1). In 19 children (90%) an

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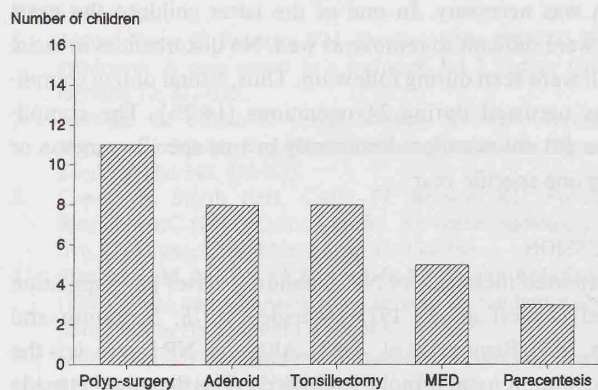


Figure 1. Previous ENT-operations (number of children).¹

¹ Previous ENT-operations: polyp- surgery (=polypectomy, Caldwell-Luc, Luc de Lima, FESS); adenoid (=adenoidectomy); tonsillectomy; MED (=middle ear drainage); paracentesis.

Table 2. Co-existing diseases.

patient	COPD	ASA	allergy	Woake's	CF
1	X				
2	X		X		
3	X		X		
4	X				
5	X	X	X		
6					X
7					X
8			X		
9				X	
10			X		
total	5	1	5	1	2

Diseases present in children with nasal polyposis (n=21): chronic obstructive pulmonary disease (COPD), acetylsalicylic acid-intolerance triad (ASA), allergy, Woake's syndrome (Woake), and cystic fibrosis (CF).

allergy test was performed. Allergy was proven if there was a positive history of allergy and the IgE/RAST (radio-allergosorbent-test) was positive (i.e., at least "+" for a specific allergen and an IgE-value of more than 100 U/l or at least "++" for a specific allergen regardless of the IgE-value) or if the skin prick test showed a skin reaction for a specific allergen higher than the (control-) reaction with histamine. Five children (24%) were diagnosed as allergic, mainly allergies to dust, dust mite, grasses, and cats. In 62% a sweat test was performed; two children with cystic fibrosis were found. No abnormal ciliary motility was found (10 children were tested). All children underwent tomographic X-ray examination of the sinuses (CT scan in 81%, and tomography in 19%).

Treatment

In 10 children (48%) the primary operation was FESS. In the remaining 11 children (52%) FESS was a secondary operation after previous polypectomy. In 18 children FESS was performed bilaterally.

Extent of NP

During the operation polyps were found in the ethmoids (100%), the maxillary sinus (57%), the recessus frontalis (33%), and the sphenoidal sinus (19%). In 13 children (62%) the polyps were so massive they protruded in the nasal cavity. In all cases histological examination showed (inflammatory) polyps.

Post-operative care

After surgery, an antimicrobial/corticosteroid gel was left in the cleared ethmoid in all cases; in 19 children (90%) nasal packing was applied. All children underwent extensive endoscopic cleaning of the nasal cavity once a week during three weeks post-operatively. Short-term antibiotic treatment was prescribed in four children. Corticosteroid nasal spray (in a dosage of 50 µg per nostril, twice a day) was prescribed in all children for at least six months.

Evaluation of data

The median follow-up was 27 months (range: 7-76 months; mean 29 months). The results were reviewed separately in two groups: group I consisted of primary FESS (median follow-up of 23 months), and group II had previous surgery for NP (median follow-up of 25 months). The data were divided into subjective results (i.e., opinion of the child and/or the parents) and objective results (i.e., post-operative findings by the surgeon). The subjective results were divided into three categories: nasal passage (improvement if the child could breathe through the nose), rhinorrhoea (improvement if the rhinorrhoea was less extensive), and smell (improvement if the smell was better). Subjective results with regard to nasal passage could be obtained from 20 children, with regard to rhinorrhoea from 15 children, and with regard to smell from 16 children. Objectively, recurrences and improvement of rhinorrhoea and nasal passage were noted by means of nasal endoscopy. When NP was noticed within two weeks after surgery, it was regarded as residual instead of recurrent disease.

RESULTS

In total (groups I and II), the subjective result was good in 77% and the objective result in 52% (Figures 2 and 3). In group I the subjective results were good in 90% and the objective results in 70%. Good subjective results were found in 64% and good objective results in 36% of the children in group II. Recurrent NP occurred in one child (10%) in group I (after 14 months) and in seven children (64%) in group II (after a mean of 17 months); in all those cases another endoscopic operation was performed. Residual polyposis was noted in three children, due to not extensive enough a FESS. In one child, renewed FESS was required, and in the two remaining children the NP disappeared spontaneously with a nasal mucosa decongestive and corticosteroid nasal spray (in the aforementioned dosage). The mean number of operations after FESS was performed was 0.2 operations per child in group I and 1.6 in group II. Comparison between groups I and II revealed no differences in mean age, male/female ratio, mean height and weight, mean period of complaints, presenting symptoms, histological examination and

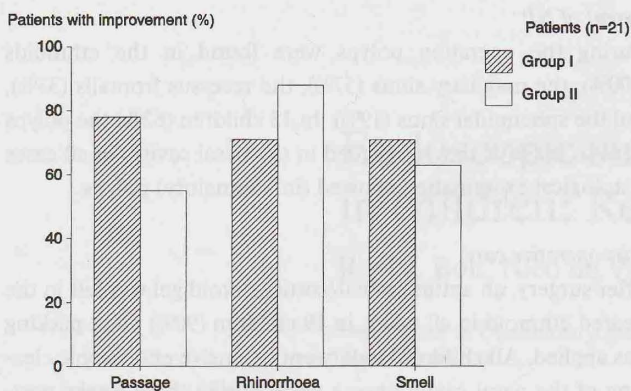


Figure 2. Subjective results.

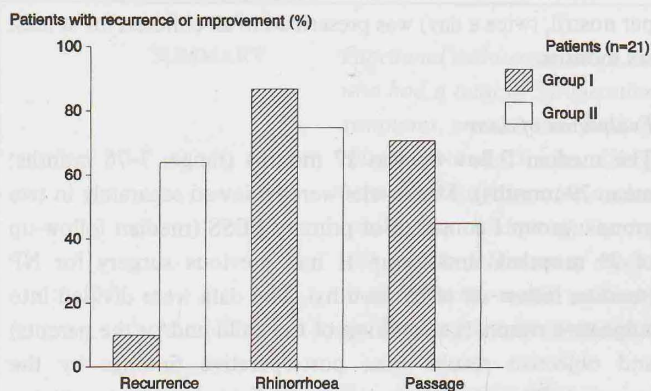


Figure 3. Objective results.

the number of children with a co-existing disease. Differences were found, however, in the mean age at which the first operation was performed - for group I this was 14.1 years and for group II 10.5 years - and in the extent of the disease, defined by the number of per-operatively cleared sinuses (including the nasal cavity). In group II a median of eight sinuses were cleared opposed to a median of three in group I.

Complications

In 65 sides operated upon, six minor complications occurred (9.2%; Table 3). In three children the nasal packs were difficult to remove under local anaesthesia, and general anaesthesia had to be used. In one child a lesion of the lamina papyracea occurred per-operatively; post-operatively the eyelids were swollen for 24 h, without disturbed vision or eye movements. In two children per-operative bleeding occurred; in one a blood trans-

Table 3. Complications (on 65 sides).

complication	number
lamina papyracea lesion	1 (1.5%)
vascular complication	2 (3.1%)
* with blood transfusion	1 (1.5%)
* without blood transfusion	1 (1.5%)
removal of nasal packs under general anaesthesia	3 (4.6%)
total	6 (9.2%)

fusion was necessary. In one of the latter children the nasal packs were difficult to remove as well. No disturbances in facial growth were seen during follow-up. Thus, a total of five complications occurred during 34 operations (14.7%). The complications did not occur predominantly by one specific surgeon or during one specific year.

DISCUSSION

The reported incidence of NP in children varies per population studied (Lanoff et al., 1973; Marsden, 1978; Schramm and Effron, 1980; Reynoso et al., 1982). Although NP is rare, it is the most common nasal tumour in children. The diagnosis is made using anterior rhinoscopy (and when possible nasal endoscopy) and preferably CT scan of the sinuses. Mertens et al. (1991) found allergy in 44.8% of NP patients aged 10-39. Others, however, found no evidence for a causal relation between NP and allergic disease or found a history of allergy in 27% of children with NP (Schramm and Effron, 1980; Perkins et al., 1989). In this study we found allergy in 24%. In contrast to adults, there is little place for systemic use of corticosteroids in children, because of the risk of serious side effects. Surgery is indicated if corticosteroid nasal spray (in the aforementioned dosage) has no effect or if there is massive polyposis. In children, extensive sinus surgery gives better results than polypectomy alone (Crockett et al., 1987; Cepero et al., 1987). This study shows that the subjective results of FESS in children with NP are good. There is, however, a poor correlation between subjective and objective results, as noted in adults (Vleming et al., 1991). In general, the recurrence percentage was lower in children with primary FESS (10%) than in children with previous polypectomies (64%); this has been found in adults as well (Stammberger, 1986). The difference between these two groups can, probably, be explained from the noted difference in extent of the NP, as found by Kennedy (1992). A recurrence rate of 10% after ethmoidectomy in children with NP, as found in group I, has been reported by others (Triglia et al., 1992). FESS in children is a safe procedure, when performed by an experienced ENT-surgeon. Three minor complications - not including three difficult to remove nasal packs - were seen on 65 sides (4.6%), and this is comparable to a complication rate of 4.2% found in adults (Vleming et al., 1992). Some authors mention no major complications in their papers about FESS in children (Gross et al., 1989; Duplechain et al., 1991; Kuttner et al., 1992; Triglia et al., 1992). Lazar et al. (1992) report a complication rate of 9% in 210 operations. This is comparable to the 8.8% (in 34 operations) we found. In this study only three children underwent general anaesthesia twice. Others advise nasal cleaning under general anaesthesia in all children to remove nasal packs (Gross et al., 1989; Duplechain et al., 1991; Lazar et al., 1992). Apart from being a safe procedure, an additional advantage, opposed to transantral ethmoidectomy, is that there is no risk of damaging the developing teeth in children. FESS probably causes no growth deformities as seen after septoplasty and external ethmoidectomy in children (Aurbach and Ullrich, 1992). FESS is the treatment of choice for massive or persistent nasal polyposis in children.

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