

# Pediatric Functional Endoscopic Sinus Surgery: Is a Second Look Necessary?

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Functional endoscopic sinus surgery (FESS) has become the surgical procedure of choice for the treatment of chronic sinusitis that is refractory to medical treatment. It has become routine to perform endoscopy in children under general anesthesia 2 to 3 weeks after FESS to facilitate examination and cleaning of the operative site. We compared the clinical outcome of 50 children who underwent FESS without a second-look endoscopy with 50 children who underwent a routine second look. Patients with systemic disease (cystic fibrosis, immotile ciliary syndrome, immunoglobulin deficiency) or undergoing a revision procedure were excluded from the study. The results show that the postoperative improvement in nasal obstruction, nasal drainage, and chronic cough was the same for both groups. We conclude that in the vast majority of children without systemic disease and not undergoing a revision procedure, a second endoscopic procedure may not offer any apparent advantage.

*Laryngoscope*, 107:1267-1269, 1997

## INTRODUCTION

Functional endoscopic sinus surgery (FESS) is an effective treatment for chronic sinusitis or recurrent acute sinusitis in patients who fail maximal medical treatment.<sup>1-3</sup> The procedure in children is similar to that in adults except that follow-up endoscopy is often performed under a general anesthetic because of lack of patient cooperation. The advantages of postoperative endoscopic examination under general anesthesia include a detailed inspection of the surgical site and removal of crusting, blood clots, granulation tissue, or adhesions. The procedure is usually performed 2 to 4 weeks after the primary operation. This period of time is

thought to allow adequate healing of the surgical site without allowing maturation of scar tissue and subsequent synechia formation.<sup>4</sup> However, this also means that most children are exposed to two general anesthetics in a relatively short period of time.

Endoscopic sinus surgery is a functional procedure for restoration of physiological function to the drainage pathways of the paranasal sinuses. Reports to date have shown a high success rate in both children and adults.<sup>1-6</sup> Most authors agree that a second-look nasal endoscopy under general anesthesia in children is an important part of the postoperative follow-up. It is reasoned that adequate postoperative medical therapy and close follow-up would minimize the need for revision FESS.<sup>7</sup> Nonetheless, there have been reports in which a second-look endoscopy under general anesthesia was not performed in all members of the studied pediatric groups after FESS.<sup>4,5</sup> However, the outcomes were not compared with outcomes in children who did have a second look, and its need as a routine procedure under a general anesthetic in children, although widely recommended, remains debatable. We present a study of 50 children who underwent FESS without a second-look endoscopy and compare their outcomes with the outcomes of 50 children who underwent a routine second-look endoscopy under general anesthesia.

## MATERIALS AND METHODS

The charts of 100 children who underwent FESS between January 1993 and December 1995 were reviewed. The outcomes of 50 consecutive patients who underwent FESS without a second-look endoscopy were compared with the outcomes of 50 patients who underwent a routine second look at 3 weeks. Patients with systemic disease (cystic fibrosis, immotile ciliary syndrome, immunoglobulin deficiency) or undergoing a revision procedure were excluded from the study. The children were treated by members of the Otolaryngology Consultants of Memphis at Le Bonheur Children's Medical Center, Memphis, Tennessee.

Patients were referred by their pediatrician or allergist after failing extensive medical therapy. A full history

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Editor's Note: This Manuscript was accepted for publication March 27, 1997.

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and physical examination were documented for each patient. Patients were considered to have chronic sinusitis if their symptoms persisted for more than 3 months despite maximal medical treatment. All patients referred to our service received a 6-week course of a broad-spectrum antibiotic, nasal steroid spray, and a decongestant. Only if they remained symptomatic after treatment were they scheduled for a coronal computed tomography (CT) scan of the sinuses. Asymptomatic patients were followed up in the office for evidence of recurrence of symptoms. Patients whose recurrent or chronic sinusitis persisted despite medical therapy and CT findings consistent with clinical manifestations were scheduled for FESS. The technique of FESS used has been previously described.<sup>1</sup> Each patient was treated postoperatively with a steroid nasal spray, nasal decongestant, saline nasal mist, and a broad-spectrum oral antibiotic.

Patients were reviewed at the office 1 week after surgery and those who underwent a second-look endoscopy were returned to the operating room 2 weeks later for examination and cleaning of the operative site under general anesthesia. Patients were followed up every 2 to 3 weeks for the first 3 months and every 6 weeks afterward.

Examination was limited to anterior rhinoscopy and removal of crusting depending on the child's age and co-operation. Postoperative improvement was based on parents' feedback during the follow-up visit and office examination. The factors measured were nasal drainage, nasal obstruction, and persistent cough. These were the most common complaints encountered and have been cited in a previous study.<sup>10</sup> The indications for a second look were limited to patients with systemic disease such as cystic fibrosis, immunological deficiency, and immotile ciliary syndrome or to patients who required revision surgery. In general these patients are known to have a poorer prognosis and higher rate of recurrence.<sup>10</sup> The procedure was considered successful if there was significant improvement or complete resolution of the preoperative symptoms.

## RESULTS

The results of 50 consecutive children (age range, 4 to 16 years; mean age, 7.3 years; 28 boys and 22 girls) who underwent a FESS without a second-look procedure from January 1994 to December 1995 were reviewed prospectively (group A) and their outcome was compared with outcomes of 50

consecutive patients (age range, 3 to 16 years; mean age, 6.2 years; 26 boys and 24 girls) who underwent a routine second look 3 weeks after FESS from January 1993 to December 1994 (group B). The average follow-up was 12.1 months (range, 6 to 22 months) in group A and 22 months (range, 6 to 52 months) in group B.

The results are summarized in Tables I and II. In group A 20 children (40%) saw complete resolution of symptoms and 25 children (50%) were improved. In group B 18 children (36%) saw complete resolution of symptoms and 24 children (48%) were improved. Children were considered *improved* if at least one symptom resolved and other symptoms recurred intermittently; *resolution* was defined as total improvement with no recurrent symptoms. There was no statistical difference in improvement in nasal obstruction, nasal drainage, and chronic cough between the two groups (Table II). Two patients (4%) in group A underwent a revision FESS, compared with seven patients (14%) in group B. No major surgical complications were noted in the 100 patients studied.

## DISCUSSION

The management of chronic sinusitis has evolved in our practice since Gross et al.<sup>2</sup> first described the successful outcome following FESS in children. To decrease the incidence of synechiae formation we previously applied methylprednisolone cream to the surgical field at the end of the procedure. We also generously added an antibiotic steroid ointment to fill the newly created ethmoid cavity. Children underwent a routine second-look endoscopy under general anesthesia to allow inspection of the surgical site and removal of granulations and immature scar tissue. At the termination of the second procedure methylprednisolone and an antibiotic steroid ointment were once again applied to the operation site. This practice was stopped in 1993, as it was thought to contribute little to avoiding granulation formation. Over the past 2 years we have stopped performing a routine second-look endoscopy in children, as it was thought to have no ef-

TABLE I.  
A Comparison of Outcome Following FESS in Children.

	Complete Resolution or Improvement in Symptoms		No Change in Symptoms	
	n	%	n	%
Group A* (n = 50)	45	90	5	10
Group B† (n = 50)	42	84	8	16
Total (n = 100)	87	87	13	13

\*Underwent FESS without a second-look procedure.

†Underwent FESS with a second-look procedure.

FESS = functional endoscopic sinus surgery.

TABLE II.  
A Comparison of Symptom Improvement After FESS in Children.

	Complete Resolution or Improvement in Symptoms (%)		No Change in Symptoms (%)	
	Group A*	Group B†	Group A*	Group B†
Persistent cough	94	94	6	8
Nasal obstruction	90	76	10	24
Nasal drainage	86	84	14	14
Total	90	84	10	16

\*Group A underwent FESS without a second-look procedure.

†Group B underwent FESS with a second-look procedure.

fect on clinical outcome. We moved toward a more selective approach targeting children that our previous studies had highlighted to be at a high risk of requiring revision surgery.<sup>3,7</sup>

There are some differences between the management of chronic sinusitis in children compared with adults. Office nasal endoscopy is not well tolerated by children and examination is generally limited to anterior rhinoscopy. A high-resolution coronal CT scan delineates the extent of disease in the sinuses and also the degree of pneumatization. In our study adult instruments were used for all endoscopic procedures. The smaller intranasal anatomy in children makes good hemostasis essential for the visualization of surgical landmarks and is best performed by experienced sinus surgeons. The major difference, however, between the two groups is in the postoperative care. As postoperative examination of the operative site is seldom possible in children without a general anesthetic, they are generally returned to the operating room 2 to 4 weeks after FESS. Early adhesions between the middle turbinates and the lateral wall are lysed and granulation tissue and crusts removed. However, certain authors have not employed a routine second-look nasal endoscopy under general anesthesia as part of the surgical management of sinus disease in children.<sup>4-6</sup> It is difficult to ascertain what the selection criteria in these studies were. The importance of routine second-look endoscopy is therefore questionable, especially in patients who are not at a high risk for revision surgery.<sup>3-7</sup>

Lazar et al.<sup>3</sup> reported that of 210 patients who underwent FESS, postoperative nasal endoscopic examination showed significant adhesions between the middle turbinate and the septum in only 20% of the studied group. Ten percent of patients had granulation tissue formation, 7% had persistent polypoid, and 11% had significant crusting. In 52% of patients the endoscopy was essentially normal, thus confirming good healing of the surgical site. In the same study more than 50% of patients who required revision FESS had severe allergic symptoms, documented immunodeficiencies, cystic fibrosis, or motile cilia syndrome. Thus in the majority of children studied the second-look endoscopy was essentially normal. Furthermore, it is not known whether granulation tissue and other pathological

mucosal changes will resolve with medical treatment or will affect the eventual outcome of surgery.

The indications and method of performing FESS continue to evolve<sup>8</sup> and it is thus important to question the need for a routine second look. The results of this study are limited by the short follow-up period. However, there has been no deterioration in the post-surgical outcome in the children who did not undergo a second-look endoscopy and the rate of revision surgery is no higher than in reported studies.<sup>7</sup> The higher rate of revision surgery in those patients who underwent a second-look endoscopy is probably related to the longer follow-up period in this group.

The preliminary results from this study suggest that adopting a selective approach to a second-look endoscopy after FESS may lead to no deterioration in overall results. The patients in this study were not age matched and the postoperative follow-up was short. However, early results appear encouraging. We think that in the majority of children, a second look under general anesthesia may not alter the outcome of FESS for pediatric sinusitis and avoids the risks of an additional general anesthetic, with its associated morbidity and costs.

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