Revision Functional Endoscopic Sinus Surgery

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KEYWORDS

• Refractory rhinosinusitis • Revision FESS • Polyps • Stenosis • Scarring • Neo-osteogenesis • Chronic rhinosinusitis

KEY POINTS

- The causes of primary functional endoscopic sinus surgery (FESS) failure are usually multifactorial; all aspects of anatomic, patient disease, and postoperative care should be considered.
- Revision FESS requires a clear understanding of the anatomic sites contributing to recurrence. Systematic assessment is essential.
- Traditional anatomic landmarks are distorted or absent during revision FESS. Alternative anatomic landmarks, which are consistently present despite prior surgery, are used to maintain clear surgical orientation.
- Revision FESS must address all the anatomic sites that contribute to recurrence. Wide antrostomies permit intraoperative access to disease and facilitates postoperative care.
- Revision FESS is a viable treatment option for patients who fail primary FESS and maximal medical treatment for recurrent chronic rhinosinusitis and have possible outflow tract obstruction.

INTRODUCTION

In the mid 1980s, otolaryngologists began using functional endoscopic sinus surgery (FESS) to address refractory chronic rhinosinusitis (CRS) that failed to respond to medical treatment. FESS can provide short- and long-term improvement in disease symptoms and quality of life.[1–3] Approximately 250,000 patients undergo endoscopic sinus surgery in the United States alone[1,4] with general good success rates ranging from 67% to 98%.[5–10] However, approximately 10% to 15% of patients who have

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sinus surgery will undergo revision surgery.[8,11,12] Multiple factors contribute to the need for revision surgery, including surgical technique, extent of disease, anatomic obstruction, and postoperative care.[11,13,14] The need for revision can be of particular concern in patients with CRS with nasal polyps who have been shown to have a high rate of regrowth.[15,16] This article reviews the main causes of primary FESS failure and discusses an approach to the medical and surgical treatment of recalcitrant CRS.

REASONS FOR FAILURE OF PRIMARY FUNCTIONAL ENDOSCOPIC SINUS SURGERY

When assessing patients who failed primary FESS, it is vital to determine the underlying cause(s) of persistent disease. Frequently, the cause is multifactorial and thus all contributing factors should be evaluated and addressed.

Anatomic, Mucosal, and Bony Factors

A number of studies evaluated the etiology of primary FESS failure and among the following causes anatomic factors are particularly common[13,14] (**Box 1**). *Middle turbinate lateralization* is cited as a common anatomic finding in 30% to 78% in those who fail FESS.[11,17–19]

Incomplete surgery

Multiple studies report incomplete surgical technique contributing to recurrent disease (**Fig. 1**): incomplete anterior or posterior ethmoidectomy in 31% to 74%, incomplete uncinectomy in 37%, and retained agger nasi cell in 13% to 49%[9,11,18,19] Additional findings included retained intersinus septations or intrasinus cells including frontal cells and Haller (infraorbital) cells.[18,19] These cells block the natural drainage pathways of the frontal, ethmoid, and even the sphenoid sinuses. Other issues include failure to locate and open the diseased sphenoid sinus, which can be mistaken for an Onodi (suprasphenoidal) cell.[17,20]

Ostium stenosis, scaring, and synechiae

Stenosis occurs when circular openings contract, preventing drainage. This can be exacerbated by the buildup of scar tissue in or near these openings, creating a thick band of tissue that obstructs the sinus and fails to respond to topical treatments. Scarring

Box 1 **Anatomic factors contributing to recurrent chronic rhinosinusitis**
Frontal sinus outflow stenosis
Incomplete anterior ethmoidectomy/agger nasi retention
Incomplete posterior ethmoidectomy
Middle turbinate lateralization
Retained uncinate
Missed ostium
Middle meatus stenosis
Maxillary recirculation
Sphenoid ostium stenosis
Synechia (in any sinus)
Neo-osteogenesis
Recurrent mucosal disease

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