

Endoscopic Approaches to the Frontal Sinus



Modifications of the Existing Techniques and Proposed Classification

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KEYWORDS

- Frontal sinus • Frontal sinusotomy • Endoscopic modified Lothrop procedure
- Lothrop procedure • Modified hemi-Lothrop procedure
- Modified mini-Lothrop procedure • Modified subtotal-Lothrop procedure
- Extended Draf IIB

KEY POINTS

- The modified hemi-Lothrop procedure (Eloy IIC) involves an ipsilateral Draf IIB and an anterosuperior septectomy window for access to the lateral recess of the ipsilateral frontal sinus via the contralateral nasal cavity.
- The modified mini-Lothrop procedure (Eloy IID) involves a contralateral Draf IIB and a frontal intersinus septectomy.
- The modified subtotal-Lothrop procedure (Eloy IIE) involves an ipsilateral Draf IIB with a superior septectomy and frontal intersinus septectomy.

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- The modified central-Lothrop procedure (Eloy IIF) involves resection of the frontal sinus floor bilaterally, with a superior septectomy and frontal intersinus septectomy, while preserving both frontal sinus recesses.
- These alterations represent expansion on the current Draf or nasofrontal classification systems and approaches.



Video content accompanies this article at <http://www.oto.theclinics.com>.

INTRODUCTION

The frontal sinus has proven to be anatomically challenging, both with respect to surgical access and management of chronic and recurrent disease. There exist numerous anatomic variations between patients and even between sides in the same patient.¹ Treatments of frontal sinus disease range from conservative long-term medical management to aggressive open surgical procedures. Advances in frontal sinus surgery have allowed for movement away from the more invasive and potentially disfiguring open approaches to less aggressive, endonasal approaches.

The Lothrop procedure described in 1914 consisted of an intranasal ethmoidectomy followed by an external Lynch-type approach with resection of the medial frontal sinus floor, superior nasal septum, and intersinus septum, which created a large frontonasal communication. The microendoscopic and endoscopic modifications to Lothrop's original technique have been described in the literature, notably by Draf,² Gross and colleagues,³ and Close and colleagues.⁴ These investigators have detailed an endonasal approach similar in concept to Lothrop that also involves creating a large common drainage pathway between the paired frontal sinuses. Efforts to reduce invasiveness and preserve the natural architecture of the frontal sinus have led recently to the description of the modified hemi-Lothrop procedure,^{5–8} the modified mini-Lothrop procedure,^{9,10} and the modified subtotal-Lothrop procedure.^{11,12}

DISCUSSION OF TECHNIQUES

Current and common methods of classification for endonasal frontal sinus drainage techniques include the Draf and nasofrontal approaches.¹³ The recent modifications of endonasal frontal sinus techniques are not included within these classification systems. For this reason, a new classification system consolidating the 2 previous methods and allowing for inclusion of the 3 recently published modifications (as well as a new modification) has been designed (**Table 1**). This article discusses these modifications in the context of the new classification scheme.

Standard Frontal Sinus Approaches

Draf I (nasofrontal approach I or Eloy I): This procedure consists of an anterior ethmoidectomy for drainage of the frontal sinus recess without dissection of the frontal sinus outflow pathway (**Fig. 1A**). This involves removal of obstructing disease inferior to the frontal sinus recess. In this technique, the anterosuperior ethmoidal cells (including the agger nasi) are resected without disrupting the frontal sinus outflow pathway.

Draf IIA (nasofrontal approach II or Eloy IIA): This procedure entails the removal of the anterior ethmoidal cells and frontal cells protruding into the frontal sinus outflow pathway, creating an opening between the middle turbinate medially and the lamina

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