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Introduction

The first frontal sinus procedure was described in 1750 [36]. Despite more than two centuries since the description of the first procedure on the frontal sinus, the optimal procedure remains unclear. Although frontal sinus surgery makes up only a small portion of all paranasal sinus surgery, the literature is filled with publications on this subject. Ellis in 1954 stated that “surgical treatment of chronic frontal sinusitis is difficult, often unsatisfactory and sometimes disastrous. The many surgical techniques available are expressions of our uncertainty and perhaps so our failure” [11].

The ideal treatment for diseases of the frontal sinus is one that will provide complete relief of symptoms, eradicate the underlying disease process, preserve the function of the sinus, and cause the least morbidity and the least cosmetic deformity. Over the last two centuries a variety of surgical procedures have been described for the treatment of frontal sinus disease. Those procedures flip-flopped from external to intranasal to external and currently to intranasal again. The ideal procedure has not been identified yet despite 2 centuries of various techniques.

The recent advances in imaging and endoscopic techniques have resulted in the resurgence of intranasal procedures for the treatment of frontal sinus disease. Frontal sinus disease, particularly chronic frontal sinusitis, is a highly morbid and sometimes life-threatening condition because of its potential complications. Despite the fact that over the years the incidence of complications has decreased, orbital and intracranial complications, including meningitis, subdural abscess, intracerebral abscess, and osteomyelitis continue to occur.
Trephination Era (1750)

Frontal sinus surgery was first described in the 18th century. It is noted that as early as 1750 Runge performed an obliteration procedure of the frontal sinus [36]. The first published report in 1870 by Wells described a frontal sinus mucus as an external and intracranial drainage procedure for a frontal sinus mucocele [44].

In 1884 Alexander Ogston described a trephination procedure through the anterior table to evacuate the frontal sinus. He then dilated the nasal frontal duct, curetted the mucosa (Fig. 1.1A,B), and established drainage with a tube that was placed in the duct [32].

At the same time Luc described a similar procedure, and two years later the Ogston-Luc procedure was established [26]. However, this technique did not gain popularity because of the high failure rate due to nasal frontal duct stenosis [7].

Radical Ablation Procedures (1895)

At the turn of the century a number of physicians were advocating a radical frontal sinus procedure. Kuhnt in 1895 described removing the anterior wall of the frontal sinus in an attempt to clear disease. The mucosa was stripped to the level of the frontal recess, and a stent was placed for temporary drainage [9]. In 1898 Riedel/Schenke described the first procedure for obliteration of the frontal sinus [34], advocating completely removing the anterior table as well as the floor of the frontal sinus with stripping of the mucosa. This procedure had the advantages of removing osteomyelitic bone as well as allowing for easy detection of recurrent disease. This procedure, however, was plagued by the unsightly cosmetic forehead deformity. Killian in 1903 described a modification of the Riedel-Schenke procedure [22]. In an attempt to minimize the cosmetic deformity he recommended preserving a one-centimeter bar of the supraorbital rim. He also recommended an ethmoidectomy with rotation of a mucosal flap into the frontal recess with stenting to prevent stenosis. At that time Killian's technique was embraced because of the success as well as the reduced cosmetic deformity. However the Killian procedure was later abandoned because of the high incidence of late morbidity with restenosis, supraorbital rim necrosis, postoperative meningitis, and mucocele formation, as well as death.

Conservative Procedures (1905)

Because of the significant cosmetic deformity as well as the high failure rate of those ablative external procedures, an era of conservatism followed next. This era consisted of intranasal approaches to the frontal sinus as well as external frontoethmoid techniques. In 1908 Knapp [23] described an ethmoidectomy through the medial wall and entering the frontal sinus through its floor, by which he removed diseased mucosa and enlarged the nasal frontal duct. His operation however never received widespread recognition. In 1911, Schaeffer proposed an intranasal puncture technique to re-establish the drainage and ventilation of the frontal sinus [38]. Numerous complica-

Fig. 1.1A,B.
Instrumentation utilized by Ogston for frontal sinus trephination and curetting frontal sinus mucosa.