10.5005/jp-journals-10001-1257

REVIEW ARTICLE

Frontal Sinus Surgery: The State of the Art

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ABSTRACT

Aim: Review and describe the essential components of modern frontal sinus surgery.

Background: Frontal sinus surgery has evolved considerably over the last century, and advances in imaging, optics, and instrumentation have contributed to contemporary treatment paradigms. Outcomes assessment has had an important role in identifying indications for surgery and future areas of research.

Review results: Numerous advancements are part of modern frontal sinus surgery and the treatment of frontal sinusitis. Anatomic studies have revealed variations that are associated with disease and pose challenges for surgery. Open approaches remain relevant in situations of difficult disease or as part of combined approaches. Endoscopic surgery, however, is central to contemporary surgical management of frontal sinus disease. Evolving instrumentation and the development of new implantable devices are increasingly relevant in the endoscopic era. Outcomes research has refined indications for surgery and identifies areas for ongoing research.

Conclusion: State-of-the-art frontal sinus surgery is the product of significant evolution and advancement. Modern surgery is reflective of improved optics and new instrumentation, and the central role of endoscopic approaches in treating frontal sinus disease. Outcomes research has been essential for developing an evidenced-based approach to frontal sinus surgery.

Clinical significance: A review of the essential components of state-of-the-art frontal sinus surgery for the practicing otolaryngologist.

Keywords: Chronic sinusitis, Draf procedure, Endoscopic sinus surgery, Frontal sinus, Minimally-invasive surgery.

How to cite this article: Marino MJ, McCoul ED. Frontal Sinus Surgery: The State of the Art. Int J Head Neck Surg 2016;7(1): 5-12.

Source of support: Nil

Conflict of interest: None

INTRODUCTION

Frontal sinus surgery has evolved considerably over the last century. Advances in imaging, optics, anatomic classification, and instrumentation have been essential in pacing that evolution.[1] There has been increased interest in rigorous outcomes assessments that are necessary for an evidence-based approach to frontal sinus surgery. State-of-the-art frontal sinus surgery is the product of technological advancements and growing outcomes evidence.

This review addresses the elemental components of modern frontal sinus surgery. Included are a discussion of the relevant anatomical considerations and contemporary indications for frontal sinus surgery. Open approaches to the frontal sinus are addressed and remain relevant in the endoscopic era. Nevertheless, advancements in optics have propelled endoscopic approaches to the forefront, and are described in detail. Instrumentation and implantable devices serve as important adjuncts, and their application in modern frontal sinus surgery is considered. Outcome studies form the framework for evidence-based treatment of frontal sinus disease and identify areas for future research.

FRONTAL SINUS ANATOMY

The frontal sinus represents a complex anatomical region with wide variation between patients and sides.[2] This has important consequences for frontal sinus disease, technical considerations during surgical dissection and potential complications. Preoperative evaluation of the radiographic anatomy by computed tomography (CT) is an essential part of performing frontal sinus surgery. The location of the nasofrontal duct, also called the frontal recess or frontal outflow tract, can often be determined preoperatively from the CT scan. Familiarity with common anatomic variations enhances interpretation of preoperative images and is helpful during frontal sinus dissection.

The frontal sinus is thought to be the last paranasal sinus to develop,[3] and may represent superior and lateral pneumatization of an anterior ethmoid cell.[4] This may account for the significant variation in frontal sinus anatomy between patients and even between sides in the same patient. Variation of the ethmoid sinuses also impact drainage and ventilation of the frontal sinus due to the proximity of the ethmoid sinuses to the nasofrontal duct. These include variations, such as the agger nasi cell (pre-infundibular ethmoid cell) pneumatization, prominent ethmoid bullae and supraorbital cells.

Ethmoid air cells may be contained wholly within the frontal recess or frontal sinus, and are termed frontal

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cells (Fig. 1). Bent and Kuhn proposed a classification scheme with 4 types of frontal cells.[4] In a type I frontal cell, a single air cell is located superior to the agger nasi cell, while in a type II frontal cell a tier of cells is located within the frontal recess superior to the agger nasi cell. Both type I and II frontal cells are cephalad to the agger nasi cell, but remain inferior to the frontal sinus floor. A type III frontal cell represents a single large cell that has pneumatized superiorly into the frontal sinus, and may be anterior or posterior to the frontal sinus outflow tract. Finally, a type IV cell is a single, isolated air cell contained entirely within the frontal sinus. Type IV frontal cells may be difficult to appreciate on CT due to thin walls and surrounding inflammatory mucosa.

Frontal cells occur as an anatomic variant in a substantial minority of patients. An analysis of 768 coronal CT scans indicated the overall prevalence of frontal cells was 20.4%.[5] Type I frontal cells were present more frequently (14.9%) than type II (3.1%), type III (1.7%), or type IV cells (2.1%). Frontal sinus hyperpneumatization, in general, was associated with the presence of frontal cells, while hypopneumatization was negatively associated with these variations (Fig. 2). In the original classification of frontal cells, these variations were described as treatable causes of frontal sinus obstruction with associated case reports.[4] The study by Meyer et al, found a statistically significant increase in maxillary, ethmoid, and frontal sinus mucosal thickening in the presence of type III and IV frontal cells.[5]

Frontal sinus anatomy is highly variable. This includes variation of the pneumatization within the frontal sinus itself and of the surrounding anterior ethmoid cells. These variations have been described as causes of frontal sinus obstruction and resultant frontal sinus disease. Furthermore these variations can pose surgical challenges, particularly as endoscopic approaches have become the standard for the treatment of frontal sinusitis.

INDICATIONS FOR SURGERY

The indications for frontal sinus surgery are not, in principle, different from those for endoscopic sinus surgery. Surgery may be indicated for the treatment of chronic rhinosinusitis (CRS), cerebrospinal fluid leak, and benign and malignant tumors of the frontal sinuses. Defining indications for the surgical treatment of CRS can be complex. Surgery typically follows maximal medical therapy, but a consensus as to what this entails has not been established. Nevertheless, maximal medical therapy is often considered to include intranasal steroids, nasal saline irrigations, and oral antibiotics, with oral steroids used in cases of polypoid disease. Failure of medical therapy warrants CT imaging and surgical evaluation. Maximal medical therapy also prepares the operative field for surgery, which is especially important in the frontal sinus where the anatomy can be challenging.[2]

Of particular importance when considering indications for frontal sinus surgery is selecting the appropriate procedure. The majority of primary procedures for CRS can be addressed by a limited endoscopic sinusotomy (Draf 1 or 2A). More challenging is identifying indications for extended approaches (Draf 2B and 3). These procedures will be detailed in a subsequent section. Failed prior frontal sinus surgery is the most common indication for an extended endoscopic approach. Neo-osteogenesis and lateralized middle turbinate are also potential indications for extended approaches, and are often seen with failed prior frontal sinus surgery. Presence of a mucocele may also necessitate an extended endoscopic approach. Anomalous frontal sinus anatomy, including type III and IV frontal cells, can also be an indication for extended

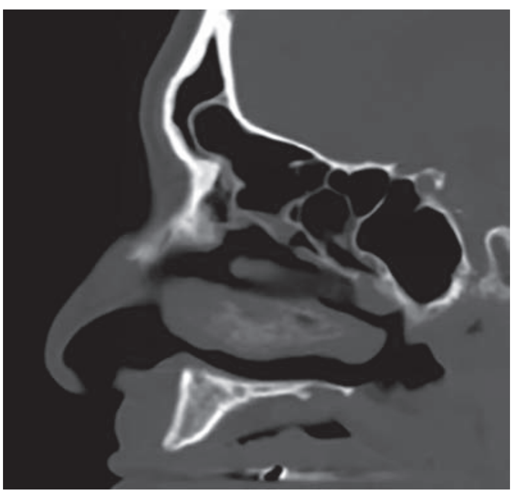


Fig. 1: Sagittal CT showing a large anterior ethmoid cell pneumatizing into the frontal sinus lumen

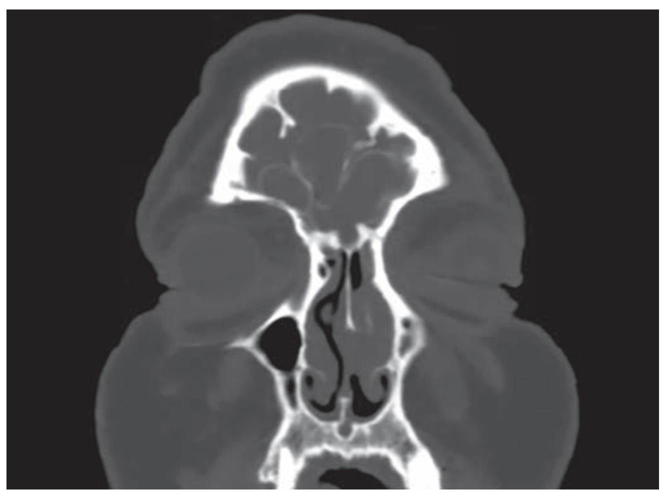


Fig. 2: Coronal CT showing a hyperpneumatized frontal sinus with multiple frontal cells (types 3 and 4) within the lumen. The sinuses are completely opacified due to polyposis

approaches. Conversely, narrow anterior-posterior dimension at the nasofrontal beak may be a relative contraindication for these extended endoscopic approaches. Lesions in a far-lateral frontal recess may not be amenable to an endoscopic approach, and consideration of an open or combined approach is necessary.

Indications for frontal sinus surgery pose a dual decision point: The need to proceed to surgery as well as selection of the appropriate procedure. Consideration of prior medical therapies employed and prior attempted surgical interventions is necessary when making these decisions. Outcomes research will continue to refine evidence-based indications for frontal sinus surgery, including directing treatments to CRS subtypes. This will likely involve both surgical and pharmacological interventions.

OPEN APPROACHES

Although endoscopic surgery has become a central component of contemporary frontal sinus surgery, open approaches remain relevant. This is particularly true in situations of lateral hyperpneumatization of the frontal sinus, aberrant anatomy, or as dictated by the disease process. Trephination, frontal sinus obliteration, and cranialization can be useful surgical approaches, and may also be used in combination with endoscopic approaches.

Specific indications for trephination include acute frontal sinusitis with or without intraorbital and intracranial complications, as a method for rapid drainage. Trephination may also be useful in laterally based mucoceles and polyps, as well as for complete dissection of type III and IV frontal cells.[6] Trephination can be used in combination with an endoscopic approach in order to re-establish patency of the frontal recess in situations of difficult neo-osteogenesis. Frontal sinus obliteration or cranialization may be necessary when frontal sinus lesions cannot be addressed by an endoscopic approach. This includes laterally-based lesions, CRS refractory to endoscopic approaches, and frontal sinus cells. Extensive fibrodysplasia and ossifying fibroma may need to be addressed by these external approaches. When more than half the frontal sinus mucosa has been affected by the external approach, frontal sinus obliteration is typically required. During frontal sinus obliteration all of the frontal sinus mucosa should be stripped and the frontal recess is occluded with bone pate, muscle or fascia. The sinus is then obliterated with fat or hydroxyapatite. Sinus obliteration with fat may be preferable as hydroxyapatite may require removal in up to 24% of cases,[7] and makes revision surgery more difficult. Cranialization may be necessary when the posterior table of the frontal bone is compromised by the disease process, including posterior table fracture with cerebrospinal fluid (CSF) leak. During cranialization a pericranial flap can be raised and sutured in continuity with the dura.[8] Direct external frontoethmoidectomy (Lynch-Howarth procedure) may have comparable results to osteoplastic flap and frontal sinus obliteration.[9]

Despite the enduring utility of open approaches, endoscopic approaches have become increasingly popular. A systematic review of the management of frontal mucoceles indicated that endoscopic approaches were used in 24.7% of cases in a historical cohort from 1976 to 2001.[10] That increased to 53.9% of cases in a contemporary cohort of studies from 2001 to 2012.[10] Recurrence and complication rates were not statistically different between the historical and contemporary cohorts. Complication rates were also similar between open and endoscopic approaches in both cohorts.[10] Endoscopic approaches are becoming the standard treatment for frontal mucoceles, with external approaches reserved for limited indications, such as a lack of image guidance, recurrence of lateral mucocele, acute traumatic injury, or recurrent disease with extensive scarring or osteitis.[11]

ENDOSCOPIC APPROACHES

Endoscopic approaches are central to state-of-the-art frontal sinus surgery, and have become increasingly popular in the contemporary era.[10] These approaches have been shown to be effective in a diversity of pathology, including laterally-based lesions.[12] Endoscopic frontal sinus surgery encompasses a variety of procedures with varied indications and uses. The classification system used in this review to discuss frontal sinus procedures was first described by Draf in 1991.[13] Other procedures, such as the frontal sinus rescue procedure and frontal balloon catheter dilation (BCD), have been described more recently.

In the Draf 1 procedure the frontal recess and infundibulum are cleared. This involves removing the superior portion of the uncinate process, the anterior ethmoid cells, and cells within the frontal recess. The agger nasi cell is preserved in the Draf 1 procedure. In this way, the narrowest part of the frontal recess is not manipulated. Rather the structures inferior to the internal frontal sinus ostium are cleared.

The Draf 2A and 2B procedures are contrasted from the Draf 1 procedure in that all cells within the frontal recess are cleared with direct opening of the internal frontal sinus ostium. In the Draf 2A procedure all cells within the frontal recess lateral to the middle turbinate attachment are opened, in addition to the structures cleared in a Draf 1 procedure (Fig. 3). A large number of primary cases, and many revision cases as well, can be addressed by a Draf 2A technique. The Draf 2B procedure involves the extension of the Draf 2A procedure to include the entire ipsilateral floor of the frontal sinus. This includes removing the middle turbinate attachment to the frontal sinus floor and extending the dissection in a medial direction, with the nasal septum and intersinus septum being the medial extent of dissection (Fig. 4). The Draf 2B procedure is considered more aggressive and potentially risky due to dissection adjacent to the cribiform plate and the potential for destabilization of the middle turbinate.

The Draf 3 procedure creates a single common drainage pathway for the bilateral frontal sinuses (Fig. 5). 'Frontal sinus drill-out' and 'endoscopic modified Lothrop procedure' are synonymous terms for the Draf 3 procedure, in which the structures cleared by bilateral Draf 2B procedures are conjoined by removal of the intersinus septum and superior nasal septum. This typically mandates the use of an angulated drill to ensure adequate removal of bone at the anterior aspect of the common frontal neo-ostium. The decision to proceed to extended endoscopic frontal sinus procedures, including the Draf 2B and 3 procedures, is typically the result of severe disease within the nasofrontal duct. This includes neo-osteogenesis, osteitis and mucosal stenosis. Anatomical considerations, including the presence of a lateralized middle turbinate or a prominent nasofrontal beak, can also influence the decision to proceed with Draf 2B and 3 procedures. Studies have demonstrated that the Draf 3 procedure can be a useful alternative to external approaches for these situations of difficult and recalcitrant frontal sinus disease.[14,15]

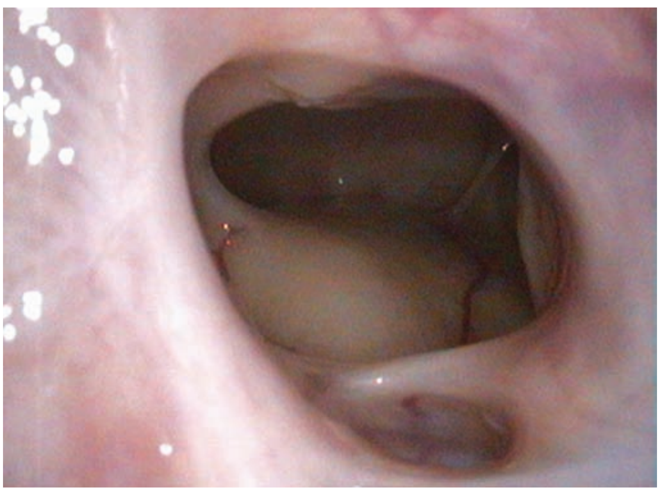


Fig. 3: Postoperative appearance of a healed left frontal sinusotomy after a Draf 2A procedure (70° endoscopic view)

The frontal sinus rescue procedure, described by Citardi et al in 1997,[16] can be an alternative to the Draf 3 procedure or external frontal sinus obliteration in certain situations. The frontal sinus rescue procedure is intended to correct iatrogenic scarring of the frontal ostium and make the sinus safe from mucocele development, when less radical techniques are not likely to be successful.[17] The surgical technique of the frontal sinus rescue procedure involves transposing a laterally-based mucosal flap from the middle turbinate remnant onto the medial skull base A longitudinal incision is made in the middle turbinate remnant and medial and lateral mucosal flaps are raised. The medial flap is resected along with the continuous mucosa on the anterior skull base. The bony middle turbinate remnant is then also resected. The lateral flap is then turned into the area of the previously resected mucosa along the anterior skull base. This has the advantage of changing the circumferential scar of the frontal duct into a geometrical pattern for prevention of recurrent scar formation. The frontal sinus rescue procedure is reported to return patency of the frontal duct in 56% of first procedures and 91% of sinuses after up to two revisions.[17]

Sinus BCD has been adopted within the last 10 years for the treatment of CRS. Although indications and

Fig. 4: Postoperative appearance of a healed left frontal sinusotomy after a Draf 2B procedure. The middle turbinate attachment has been sacrificed and the sinus floor has been completely removed (70° endoscopic view)

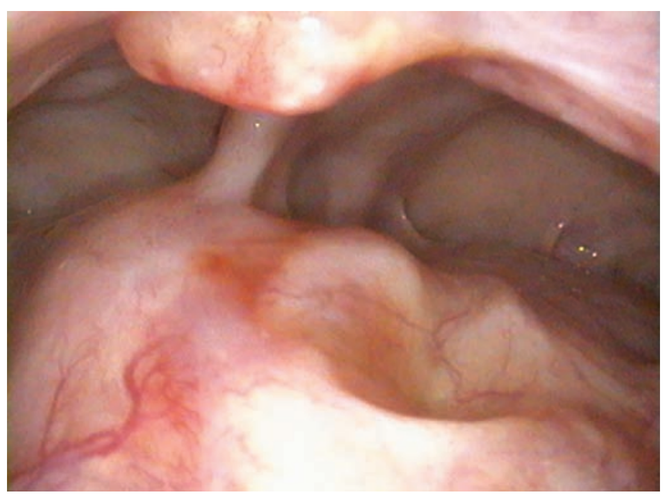


Fig. 5: Postoperative appearance of a healed endoscopic modified Lothrop (Draf 3) procedure. Both frontal sinuses have been united into a common cavity with a broad outflow tract (70° endoscopic view)

patients best suited for sinus BCD are not entirely clear, reports have indicated that this intervention can be a safe and effective surgical adjunct in frontal sinus surgery.[18,19] Balloon catheter dilation of the frontal sinus may be particularly useful in situations of frontal duct stenosis following failed sinusotomy. The procedure can potentially be performed in the office setting and avoid a return trip to the operating room. Frontal sinus BCD may not be effective in relieving stenosis secondary to neo-osteogenesis and osteitis. Further research will be necessary for more clearly defining the indications for frontal sinus BCD.

A common element of the various endoscopic frontal sinus procedures is the preservation of mucosa within the nasofrontal duct in order to prevent postoperative stenosis. In a report by Valdes et al in 2014 the causes of failed endoscopic frontal sinus surgery for chronic rhinosinusitis were investigated, and many were related to surgical technique. Hypertrophic mucosa and neo-osteogenesis were considered unrelated to technique and were implicated in 92.7 and 45.9% of failures, respectively.[20] Surgically related causes of failed endoscopic frontal sinus surgery included retained agger nasi cell (73.4%), lateral scarring of the middle turbinate (47.7%), residual anterior ethmoid cell (32.1%), and residual frontal cells (24.8%). In any endoscopic approach to the frontal sinus, meticulous care is required to ensure preservation of the sinus mucosa as well as the completeness of dissection.

SURGICAL ADJUNCTS

Surgical adjuncts have been an important part of the development of modern frontal sinus surgery. Advances in optics have allowed for improved endoscopic visualization of the frontal sinus and helped to solidify endoscopic approaches as the mainstay of contemporary surgery.[1,10] Evolving instrumentation and image-guided surgery have also enhanced the extent of disease that can be treated by an endoscopic approach. Frontal sinus stenting can also be a useful adjunct for promoting durable surgical outcomes. State-of-the-art frontal sinus surgery relies on these advances due to the inherent difficulty in visualizing and instrumenting the complex anatomy of the frontal sinus.

High-quality 45º, 70º and 90º endoscopes are indispensable in visualizing the frontal recess and into the frontal sinus lumen. Reverse-post angled endoscopes with angled optics can facilitate dissection in the frontal recess. Intraoperative image-guidance navigation systems help to ensure complete dissection, which may not be apparent by endoscopic vision. The image-guidance workstation may also be used preoperatively as an adjunct for surgical planning.[21]

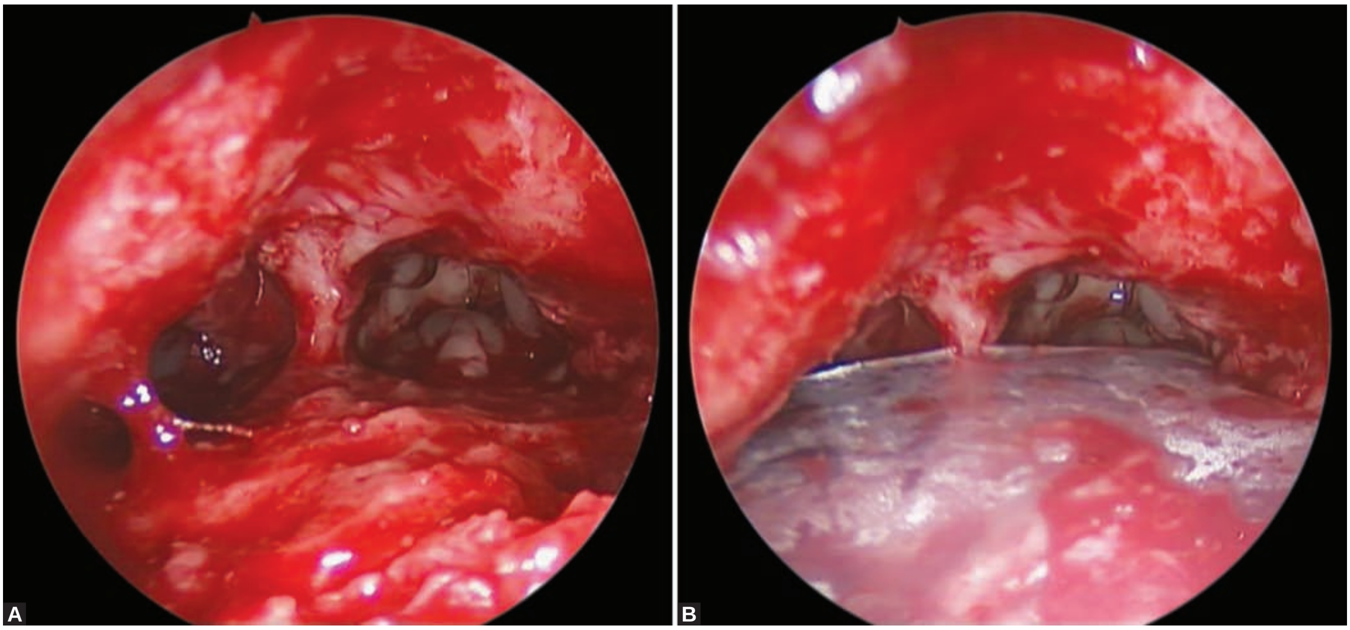
Instrumentation for specific use in the frontal sinus can aid in complete dissection. The 65º mushroom punch is useful for frontal recess dissection. The Hosemann punch, which is essentially an angulated mushroom punch with greater cutting strength, is useful for clearing osteitic bone from the frontal recess. The Bachert or 'cobra' forceps, which resembles a 70º angled Kerrison rongeur, can be employed to clear the agger nasi and frontal recess cells. Powered instrumentation with angled drills is typically used when performing extended endoscopic approaches, as in the Draf 3 procedure. Various configurations and bur shapes are available to address specific anatomic needs. Fluted cutting burs provide efficient removal of bone while diamond burs allow nuanced contouring of the frontal neo-ostium.

Reports have indicated that stenting of the frontal sinus may be useful in preserving the results of surgical dilation of the frontal sinus. In 1976, Neel et al tested firm silicone tubing and thin silicone sheeting as frontal sinus stent material in animal and human studies. In the animal studies, using a dog model, the frontal sinus was dilated through an open approach and silicone tubing and sheeting were compared to no stenting and a sham operation. The silicone sheet stenting resulted in a 2 to 4 mm frontal duct patency in all cases, while silicone tubes resulted in complete occlusion to 2 mm frontal duct patency.[21] A completed operation without stenting resulted in complete obstruction of the duct, while frontal ducts remained patent in a sham operation. These results were consistent in a clinical case series with 2 of 3 patients failing stenting with silicone tubes, but only 1 of 4 failures with thin sheeting.[22] In modern surgery, silicone sheeting can be cut to shape and inserted endoscopically to promote mucosalization and patency following extended approaches, such as Draf 2B or 3 procedures (Figs 6A and B). These stents may be readily removed in the office setting several weeks postoperatively. These frontal stents may even be durable and well tolerated for several years.[23-25]

Stenting of the frontal sinus ostium with bioabsorbable material has been attempted based on anecdotal experience using a variety of materials. The recent introduction of dissolvable steroid-eluting stents for the ethmoid sinus raises the possibility for similar applications to frontal sinus surgery.[26-28] Development of adjuncts to enhance the postoperative healing after frontal sinus surgery will be an area of ongoing research.

POSTOPERATIVE CARE

Postoperative care is central to preserving surgical results. Typical postoperative regimens include topical irrigations as well as possible oral medications. In one suggested



Figs 6A and B: (A) Intraoperative appearance of the common cavity created by a Draf 3 procedure (70° endoscopic view); and (B) placement of silicone sheeting as a stent to promote mucosalization

regimen, saline irrigations are begun on postoperative day 1 and performed 3 times daily for the first week. Saline irrigations are then decreased to once daily for another 6 to 12 weeks.[2] If allergic fungal sinusitis or substantial nasal polyposis is present, topical steroid, such as budesonide (0.5 mg/2 mL) may be added to saline irrigations.[29,30] When possible, the medication should be delivered as part of a high-volume, low-pressure irrigation to maximize delivery to the sinus lumen.[31] If high-volume irrigations are not tolerated, the concentrated medication may be applied via instillation in a head-back (Mygind) position.[32] Oral regimens of postoperative prednisone (0.1 mg/kg) and antibiotics are sometimes recommended for several days postoperatively.[2]

Debridement is also an essential part of complete postoperative care. Patients are typically seen 1 week postoperatively for the first debridement under topical or local anesthetic. The frontal recess is suctioned free of mucus and clot, crusting and bone fragments are removed with forceps, and scar tissue is lysed. Care is taken not to cause mucosal bleeding, which may lead to further clotting and scar formation. New bleeding will also obscure the surgeon's vision of the frontal recess. The 45° and 70° endoscopes are used to ensure patency of the frontal recess. If purulence is encountered during postoperative debridement, cultures may be taken and culture directed antibiotics initiated. Further postoperative follow-up, with debridement as necessary, is scheduled at regular intervals during the first 3 months. By 12 weeks the frontal recess is usually well healed.

OUTCOMES RESEARCH

There has been increasing interest in outcomes research. Outcomes research forms the framework for an evidence-based approach to treatment options and has applications for frontal sinus surgery. Moreover, indications for surgery evolve to reflect new insights from outcomes research. Further research is necessary in areas where considerable controversy exists in the current literature.

This review has previously discussed the data indicating etiologies for failure in frontal sinus surgery.[20] Many of the causes can be traced to surgical technique and the completeness of dissection of the frontal recess. This highlights the need for meticulous dissection in the frontal recess when using endoscopic approaches. Hypertrophic mucosa and neo-osteogenesis were also identified as reasons for frontal sinus surgery failure.[20] A classic publication has indicated that stenting of the frontal duct with thin silastic sheeting may be useful in preventing this obstruction by hypertrophic mucosa.[22] Identification of these areas of common failure of endoscopic frontal sinus surgery is important for tailoring procedures and surgical adjuncts to avoid these complications.

Limited primary frontal sinus surgery can be effective in maintaining frontal sinus patency and resolving chronic symptoms. In a report of 109 patients undergoing a primary Draf 2A procedure, frontal sinus patency was achieved in 92% of 210 operated frontal sinuses at a mean follow-up of 22.9 months.[33] In that cohort, 78% of patients had complete symptom resolution, whereas incomplete symptom resolution was associated with frontal recess stenosis. A separate study investigated whether a hybrid technique of anterior ethmoidectomy and frontal sinus BCD could maintain similar frontal sinus ostia patency as the Draf 2A procedure.[34] All of the frontal ostia in both groups remained patent at 3 months of follow-up. At 1 year of follow-up, 73% of patients were examined, and all frontal recesses were patent. Studied from a different perspective, one series reported the number of patients that required extended endoscopic approaches. Only 25 of 186 patients over a 5-year period advanced to Draf 2B, Draf 3, or transseptal frontal sinusotomy.[35] These studies indicate the efficacy of primary frontal sinus surgery in resolving symptoms and maintaining frontal sinus recess patency.

Some controversy exists over the long-term efficacy of Draf 3 procedures. A series of 229 patients reported by Naidoo et al in 2014 indicated that the long-term patency rate was 97% and that 95% of patients avoided revision Draf 3 procedure.[36] The mean follow-up in that cohort was 45.0 months [standard deviation (SD), 22.3 months]. A similar report of 204 patients by Ting et al, also in 2014, indicated a substantially higher rate of revision Draf 3 surgery. In their series, 29.9% of patients required revision surgery and 10.8% ultimately progressed to frontal sinus obliteration.[37] Mean follow-up was 10.2 years, with 61% of patients having revision surgery within 2 years, and failures up to 10 years following primary Draf 3. It appears that the Draf 3 procedure can be effective in the majority of patients who suffer from medically and surgically recalcitrant frontal sinus disease, although the long-term durability is not entirely clear. Nevertheless, intraoperative frontal ostium size was found to determine frontal ostium area at 1 year of follow-up, and therefore, may serve as a predictor for patients at risk for stenosis.[38] Further study of long-term outcomes from the Draf 3 procedure will be required.

FUTURE DIRECTIONS

The future of frontal sinus surgery is likely to be influenced by continuing advances in technology. The current state of frontal sinus surgery is the result of several decades of improved optics, instrumentation, and imaging. The uses of endoscopic techniques will expand with these technological improvements. Refinements to image guidance will also aid in expanding these borders. Moreover, the procedural setting may change to some extent from the operating room to the office. This will be fueled by instrumentation from the operating room being converted for use in the office setting.

Continued outcomes research will also shape modern frontal sinus surgery going forward. A growing interest in outcomes assessment has been influential in defining indications for frontal sinus surgery, and the application of specific procedures. As new data become available the indications for frontal sinus surgery will be further refined to reflect the evidence.

CONCLUSION

Frontal sinus surgery has evolved considerably in recent decades. Endoscopic approaches have revolutionized frontal sinus surgery, and have become the standard approach to frontal sinus disease. Advanced technologies have solidified the primacy of the endoscopic approach to the frontal sinus. An increased interest in rigorous outcomes assessment serves to refine indications for frontal sinus surgery and identify areas for future research. State-of-the-art frontal sinus surgery is likely to see rapid development in the coming years.

CLINICAL SIGNIFICANCE

The essential components of modern frontal sinus surgery are presented for the practicing otolaryngologist.

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