Frontal sinus disease continues to be one of the great challenges in Rhinology with highly variable anatomy, difficult visualization and a predilection to stenosis. The surgical options for frontal sinusitis range from a very limited opening of the anterior ethmoid to bilateral transseptal openings of the frontal sinus. Selection of the appropriate strategy is based on individual anatomy, pathophysiology of the targeted disease and the goals of surgery. For frontal sinus drainage, a classification system for endonasal frontal sinus surgery has been developed by Wolfgang Draf 6: Type I - simple drainage, Type IIa and IIb - extended drainage, and Type III - endonasal median drainage. From type I to type III, frontal sinus drainage surgery is increasingly extensive. Typically, a more conservative, less extensive approach is favored, as surgical manipulation in the frontal recess introduces the possibility of osteoneogenesis and frontal recess stenosis from surgical trauma. Opening a frontal sinus with an extended unilateral approach is limited by the septum and orbit, as in Draf IIb. There are situations when these limitations do not allow for sufficient width for an opening to remain patent, therefore, extension to the opposite site is appropriate. A Draf III, which opens the frontal sinus floor from orbit to orbit, is the next option. With this in mind, an extension of the Draf IIb technique can be used to open an obstructed frontal sinus across midline but not extend to the opposite orbit. This will allow for sufficient drainage while minimizing unnecessary surgical manipulation of uninvolved areas. This technique, describe as Draf IIc (Fig. 1), can be best applied in the setting of a central frontal cell or an eccentrically placed frontal sinus septum.

Two patients with a history of right chronic frontal sinusitis requiring revision endoscopic frontal sinus surgery were identified. In both cases, conservative medical therapy was unsuccessful in aerating the opacified right frontal sinus and alleviating patient’s symptoms of frontal pressure and headache. Pre-operative nasal endoscopy and CT scan of the sinuses in each case revealed an obstructed right frontal sinus outflow tract and persistent opacification of the right frontal sinus (Figs. 2 & 5). There was insufficient space in the medial-lateral dimension for adequate drainage without restenosis. Revision frontal sinusotomy was performed entering the contralateral frontal sinus via a trans-septal route. The contralateral frontal recess was not disturbed. Both patients received routine endoscopic sinus surgery follow-up. Patency of the drainage pathway and aerated frontal sinuses were assessed by post-operative nasal endoscopy and/or CT scans.

RESULTS

Frontal headache and pressure were resolved by the first postoperative visit. Postoperative CT scan and nasal endoscopy showed well-aerated frontal sinuses with a widely patent common drainage pathway and a normal mucosa with no exposed bone or edema (Figs. 4 & 7).

DISCUSSION

The choice of approach to widen the frontal recess ranges from unilateral opening of the frontal sinus with uncincetomy to wide bilateral drainage from orbit to orbit. The Draf classification system provides a systematic graduated framework for this surgery. In unusual circumstances, ipsilateral endoscopic frontal sinus drainage is prohibitive. Causes of endoscopic inaccessibility of the frontal recess include: narrow anteroposterior and mediolateral dimensions of frontal recess; severe scarring and synchia; new bone formation and; impingement by the anterior cranial fossa. Anatomic factors that facilitate the approach described here include an intrrafacial sinus central cell or eccentric interfrrontal sinus septum. In these cases, before moving forward with a more aggressive procedure (Draf III or frontal osteoplastic flap, consideration should be given to a less extensive approach, a Draf IIc to avoid more invasive procedures and minimize surgical manipulation of the non-involved side.

CONCLUSIONS

Two cases were presented in which a modification of the Draf IIb approach for frontal sinusotomy termed a Draf IIc was successfully used. The Draf IIc provided a method for opening a frontal sinus utilizing a central frontal sinus cell. The Draf IIc is an important surgical option in cases of chronic or recalcitrant frontal sinus diseases, including unilateral and bilateral obstruction, where access to the ipsilateral frontal recess is limited or favorable anatomy allows drainage with reduced manipulation of an uninvolved side.

REFERENCES

5. Rohl DD, Melvin TA, Bolger WE, Lane AP. The frontal intersinus septal cell out procedure: revisiting a technique for surgically refractory unilateral frontal sinus disease. Laryngoscope 2011; 121:1805 - 1809.
12. Van Alyea OE. Frontal cells: an anatomic study of these cells with consideration of their clinical significance. Arch Otolaryngol 1941 Jul; 34: 31 - 23.