In their article on cranialization of the frontal sinus, van Dijk et al., discuss a useful (albeit rarely applied) surgical method for addressing chronic frontal sinusitis refractory to other therapies. Their retrospective review presents their data on a small cohort of 15 patients accumulated over the course of a 20-year period in whom this surgery had been performed. They note a mean follow-up of 6.5 years and a high success rate, defined as resolution of symptoms, in the 13 patients who were available for follow-up. The authors note that this is a final surgical step for patients in whom other treatment options have failed, and refer to the fact that they have averaged less than one procedure of this type per year as testament to it being reserved for only the most refractory of cases. Despite this, it is somewhat difficult to determine from their manuscript what the role of this more invasive approach for a benign disease may be, and a brief review of the surgical management of frontal sinusitis is worth putting forward.

Chronic frontal sinusitis has been one of the more difficult diseases for the rhinologic surgeon to manage. Until the last decade or two, the gold standard for surgical management of the frontal sinus had been an osteoplastic flap with obliteration. This was secondary to several factors, including what we now know to be a genuine lack of knowledge about the pathophysiology of many refractory cases and the difficulty of performing other less invasive approaches due to the significant angulation required of any endonasal approach. Furthermore, the morbidities related to other open approaches, as also noted by van Dijk et al., made them unattractive alternatives. For instance, in this manuscript the authors refer to the open Riedel procedure, in which after removal of the anterior table, the sinus mucosa is stripped and the forehead skin is allowed to settle into the cavity. The comparison is unjust, though, in that this is for all intents and purposes an abandoned procedure reserved only for severe cases of osteomyelitis. Furthermore, with the advent of advanced surgical techniques and angulated scopes (ranging from 30° to 70°), the osteoplastic flap, against which the authors mostly contrast their procedure, has arguably been relegated to the last option on the operative ladder for the rhinologic surgeon.

In an excellent review by Kuhn, the many less invasive options currently available are described in a stepwise approach of elevating difficulty, including balloon dilation of the frontal recess; endoscopic frontal sinusotomy (most often performed); drill-out procedures; endonasal median drainage (for example, Draf III, transseptal frontal sinusotomy, or the endoscopic Lothrop procedure); osteoplastic flap with or without obliterations; and even unobliterations. It is obvious from the ladder that there are multiple steps before an osteoplastic flap should be contemplated, and even when it is performed, significant thought should be given before deciding to condemn the sinus and obliterating it, given the long-term potential mucocele formation rate (approximately 10%). Even then, surgical management of osteoplastic flap failures through an endoscopic, modified Lothrop procedure has been described, with good results. In his review, Kuhn does include a discussion of the cranialization procedure, but notes that it “is mentioned only to condemn it.” His point of view in this regard is the concern that a neurosurgeon who may not be completely aware of sinonasal anatomy or the appropriate manner by which the frontal sinus mucosa must be removed and the frontal recess closed off may inadvertently subject the patient to delayed poor outcomes such as intracranial mucoceles, which would require additional craniotomies to resolve. Toward this end, however, van Dijk and colleagues do describe a very thorough process of mucosal stripping, followed by bone drilling, followed by inversion of frontal recess mucosa and plugging with connective tissue and glue to avoid this complication. Given their relatively short follow-up (mean 6.5 years) and lack of delayed postoperative films, it remains uncertain if any such occult issues may be in process.

Overall, van Dijk et al. do report their lack of major complications (one patient had frontal lobe injury and another had osteomyelitis of the bone flap) as comparable to the 20% complication rate they note for the Draf endonasal median drainage procedure (Draf III). However, the referenced source actually notes a 91.5% success rate and an overall complication rate of 17.3%, where 14% of the complications were periorbital injury without further major sequelae, and 2.3% were dural injury but without sequelae of meningitis or further leakage. Other authors have published a larger series with even fewer complications (1 of 83) and a greater primary success rate (93%).

Although cranialization of the frontal sinuses is generally accepted in circumstances of trauma with posterior
table involvement or in the case of intracranial complications of acute frontal sinusitis, it remains uncertain at which point this procedure should be offered in the setting of chronic sinusitis. Therefore, the role of cranialization in the management of refractory sinusitis, as noted by van Dijk et al., should be considered as the procedure of last resort. Furthermore, although it may be the final step on the operative ladder, if critical attention is not paid to addressing the sinus mucosa and obstructing the frontal recess, it may not be the final procedure required by the patient. While the details of the intricacies of frontal sinusitis and its surgery may be beyond the general interest of the neurosurgeon, such knowledge is critical before contemplating a cranialization procedure, and decisions in that direction should be made in concert with a rhinologic surgeon, as is the practice of van Dijk and colleagues.

Disclosure

Dr. Payne is a member of the speaker’s bureau for Acclarent, Inc.

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Response

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