Chronic Rhinosinusitis With Massive Polyposis Causing Proptosis Requiring Craniofacial Resection

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Abstract: Chronic rhinosinusitis (CRS) is a common health problem in the Western world. It is classified as CRS with (CRSwNP) and without (CRSsNP) nasal polyps. A less common third type is allergic fungal sinusitis, which often presents with polyps and, not infrequently, skull base erosion. Most patients are successfully managed with medical therapy or endoscopic approaches. There are currently no reports of CRSwNPs resulting in fibro-osseous thickening and proptosis in the English literature. As such, the authors report a case of a 33-year-old man who underwent a craniofacial resection with drilling of the hyperostosed bone, which led to resolution of the proptosis and nasal symptoms. In an era where endoscopic surgery is the standard surgical approach for CRSwNP, this case highlights the need for open skullbase approaches for this condition due to the extensive and recalcitrant nature of the disease. While the majority of patients can be dealt with endoscopically, the authors highlight the importance of having the open approach in the otolaryngologists’ armamentarium for patients of recalcitrant and extensive CRSwNP.

Key Words: Chronic rhino-sinusitis, cranio-facial resection, polyposis, proptosis

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FIGURE 1. (A) T2 axial, (B) gadolinium-enhanced sagittal, and (C) coronal images showing extensive polyposis within the nasal cavity, sphenoid, and ethmoid air cells. There was significant hyperostosis of the frontal and orbital bones and resultant proptosis. (D–F) Postoperative plain axial computed tomography scan of the brain showing no residual disease.
DISCUSSION

Endoscopic sinus surgery has become the gold standard surgical treatment for CRS. Although insights into the pathophysiology of CRS have expanded over time, the exact etiology is still unknown and believed to be multifactorial. Enormous heterogeneity exists in the pathophysiological mechanisms that lead to chronic sinus dysfunction. While a combination of maximal medical management and ESS usually results in good outcomes, the incidence of recurrence and repeat treatments is high. In a recent study, over 50% of patients with CRSwNP were reported to have undergone previous sinonasal surgery. In our patient, the disease was so fulminant and extensive, with significant involvement of the frontal sinuses and posterior orbital roof. Having failed both an endonasal and osteoplastic procedure, we felt an open approach was the best option to deal with the extensive nature of the disease.

The incidence of bony involvement is reported higher in African American men, and this was seen in our patient as well. Ghegan et al found that African American men were 15 times more likely to have bony erosion than Caucasian men and African American women combined. However, it is possible that other variables such as socio-economic, environmental, and geographic factors may confound this statistic.

Comer et al suggested that the presence of, and involvement of, a supra orbital ethmoidal cell was often the cause of proptosis. They recommend that in ESS, special attention is paid to this area of dissection to fully open outflow tracts to restore muco-ciliary clearance. However, in our patient the proptosis was a result of thickening of the orbital roof possibly due to an extensive inflammatory response of the polyposis. Bone erosion and proptosis are significantly more common with allergic fungal sinusitis, but in our patient there was no evidence of a fungal process.

In patients with extensive disease not controlled with maximal medical therapy and endoscopic approaches, the open bifrontal extradural transbasal approach allows for removal of disease from the skull base, decompression of both orbits up to the apex, and complete extirpation of inflammatory disease with excellent exposure.

In conclusion, CRSwNP causing hyperostosis of the orbital bone resulting in proptosis is very unusual and is an important entity to recognize, since most patients described cause orbital roof erosion. While the majority of patients of CRSwNP can be dealt with endoscopically with Draf III procedures, we highlight the importance of being familiar with the open approach, as not every patient will have a successful outcome from endoscopic sinus surgery. Likewise to achieve a good result may require a close collaborative effort with a good working relationship between Otolaryngology and Neurosurgery. Thus, for patients of recalcitrant and extensive CRSwNP, knowledge of the open approach should be in the otolaryngologists’ armamentarium.

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