Abstract

Objectives: Case report of an adult male with a 5-year history of undiagnosed frontal sinusitis presenting with “doughy” left frontal forehead swelling that required frontal osteoplastic flap approach for frontal sinus osteomyelitis despite prior endoscopic maxillary/ethmoid surgery.

Study Design: Surgical case report with digital pictorial perioperative displays.

Methods: Literature review completed for causation, diagnosis, radiologic imaging, treatment, and potential complications of Pott’s Puffy tumor since first described by Sir Percival Pott (1771).

Results: Preoperative CT/MRI imaging demonstrated ground glass opacifications of the frontal sinuses, anterior table wall erosion with fluid in the left scalp soft tissues with posterior table wall dehiscence without intracranial involvement. Management of the large frontal mucopyocele included intravenous antibiotics (Vancomycin and Ertapenem) for 8 weeks, endoscopic surgical debridement and cultures, emergency frontal sinus trephination, and osteoplastic flap approach for mucopurulent drainage and culture, frontal sinus reconstruction with mesh graft, and fat obliteration. Traditional 6-foot Caldwell Luc template view was NOT accurate for surgical bone flap mapping and elevation due to severe reactive neo-osteogenesis. Inadvertent misplaced twist drill created a pinhole CSF leak repaired with bone wax. Conclusion: Pott’s Puffy tumor is rare with new century antibiotic therapy and sophisticated radiologic imaging. However, with increasing outpatient antibiotic use and subsequent microbial resistance, and frontal sinus disease refractory to endoscopic sinus surgery, patients may require combined anterior skull base/neurosurgical treatment.

Case Report

49-year-old male with a history of Chronic Rhinosinusitis presented to the Henry Ford Health Systems with a three-week history of nasal congestion and swelling over his left forehead in May 2010. He was previously treated with oral antibiotics at an outside institution. On exam, the patient has purulent nasal drainage and a doughy consistency to his forehead. On endoscopic evaluation, patient had purulent sinonasal drainage and previous maxillary antrostomies and ethmoidectomies. The patient underwent a CT-Scan and MRI of the sinuses that revealed an aggressive infection of the frontal sinuses with resultant osteomyelitis of the frontal bone (Figure 1 & 2).

The patient underwent endoscopic sinus surgery and we were unable to open the frontal nasal recess due to extensive reactive bone formation. The decision was made intraoperatively to perform a frontal sinus trephination with drain placement (Figure 3). The patient’s forehead swelling did not improve; therefore he was placed on eight weeks of IV Vancomycin and Ertapenem.

After completing the appropriate antibiotic therapy, the patient was taken back to the operating room and underwent an osteoplastic flap for frontal sinus obliteration (Figure 4). The 6-foot Caldwell x-ray template view was not accurate for surgical bone mapping due to the neo-osteogenesis of the disease process. Subsequently the twist drill was inadvertently placed through the frontal bone causing a CSF leak repaired with bone wax. The osteoplastic flap was created and the frontal sinus mucosa was exposed and obliterated with a series of diamond burs (Figure 5). Abdominal fat was placed into the defect and the bone flap was secured with titanium plates (Figure 7 & 8).

The patient tolerated the procedure well and was discharged home on postoperative day 2 on 8 weeks of IV antibiotics. His symptoms have completely resolved.

Literature Review

Pott’s puffy tumor is an entity first described by the neurosurgeon Sir Percival Pott in 1760. The disease process involves osteomyelitis of the frontal bone leading to subperiosteal abscess. The “puffy” mass on physical examination of the forehead represents the frontal sinus infection eroding the sinus cavity into the anterior frontal bone. The abscess remains localized and round due to the close relationship between the frontal bone and periosteum.

Patients may present with a headache, nasal drainage, diplopia, and a round swelling of the forehead which is classic for “Pott’s puffy tumor.” The individuals affected have a history of sinusitis or trauma. An infection ensues and travels from the frontal sinus mucosa through the valveless veins to the anterior table causing a subperiosteal abscess to form. In addition, the infection can spread through the posterior table and cause meningitis, epidural or subdural empyema, or frontal lobe abscess.

Radiographically, the disease manifests as frontal sinus disease that has eroded the frontal sinus wall and developed into a subperiosteal abscess, Figure 1 & 2. The doughy forehead represents this entity.

Treatment consists of IV antibiotics and endoscopic sinus surgery to enlarge the frontal recess to allow for drainage of the infection. Consequently, if these measures fail to eradicate the infection a frontal sinus trephination should be performed with subsequent osteoplastic frontal sinus obliteration.

Conclusion

Pott’s puffy tumor is a rare disease. Only a few cases have been described in the literature. The advent of broad spectrum antibiotics has limited the development and severity of this disease. Consequently, antibiotic resistance has ensued in the modern era and disease processes are reverting at an alarming rate. Patients are now developing more severe infections that are increasingly difficult to manage. Mortality rate is 5-10% despite antimicrobial therapy.

In the current case, the patient developed Pott’s puffy tumor and severe reactive bone formation caused a discrepancy between the six-foot Caldwell template used to make the osteoplastic frontal sinus bone flap, which resulted in a CSF leak. Otolaryngologist should be aware of technological and radiographical discrepancies.

Bibliography