For several days, a 9-year-boy has had painful swelling on the top and left side of his forehead, bilateral eye swelling, intermittent fever, and nasal congestion. He was seen in the office 4 weeks earlier, after he had hit his left eye on a school desk. At that time, he presented with a left retro-orbital headache, nasal congestion and discharge, and intermittent fever.

**THE CASE:** For several days, a 9-year-boy has had painful swelling on the top and left side of his forehead, bilateral eye swelling, intermittent fever, and nasal congestion. He was seen in the office 4 weeks earlier, after he had hit his left eye on a school desk. At that time, he presented with a left retro-orbital headache, nasal congestion and discharge, and intermittent fever.

What is the most likely cause of the patient’s symptoms?
- Eosinophilic granuloma
- Kerion
- Pott puffy tumor
- Galeal hematoma

*(Answer and discussion begin on the next page.)*

**DISCUSSION:** The patient has **Pott puffy tumor**, an infectious progression of sinusitis into the frontal subperiosteal and bony tissues. This uncommon complication of sinusitis is seen 3 or 4 times a year in most major tertiary referral centers.

Pott puffy tumor was originally described by Sir Percivall Pott in 1768. In most patients, the process begins with frontal or ethmoid sinusitis (Figure 1) that deteriorates into an associated subgaleal abscess and frontal osteomyelitis (Figure 2). Complications include epidural or subdural abscesses (Figure 3), meningitis, and encephalitis. Periorbital abscesses and cellulitis may also represent complications of worsening sinusitis.

The process most commonly affects persons aged 10 to 40 years. The culprit organisms are *Streptococcus*, *Haemophilus influenzae*, *Staphylococcus*, and *Klebsiella*. Pott puffy tumor is also associated with trauma and intranasal cocaine abuse.

Patients usually have a prolonged history of chronic sinusitis. Previous antibiotic regimens may have been ineffective presumably because of poorly perfused sinus mucoceles or resistant bacterial strains.

Because the process is indolent, patients often have a nontoxic appearance. Typically, they present with headache, fever, and photophobia; localized signs of inflammation and soft tissue swelling may be present. The surrounding scalp edema and erythema suggest an underlying abscess. Orbital involvement is frequent; pain in the extracranial area may point to a concomitant periorbital abscess or cellulitis. Include a detailed examination of extraocular movement in the evaluation for periorbital involvement.

Laboratory studies generally include blood cultures; however, the diagnosis is made radiographically. CT of the head and sinuses is the initial test of choice, because it identifies all the involved structures both intracranially and extracranially. Abscesses are better delineated with contrast scans. MRI may be more useful if cavernous or sagittal sinus thrombosis, orbital involvement, subtle abscesses, or subdural empyema is suspected.

A coordinated approach that involves neurosurgical and otolaryngologic intervention is necessary to debride the abscess and osteomyelitis and to drain orbital, intracranial, and sinus purulence. Empiric broad-spectrum antibiotics with CNS penetration must be administered promptly; wound cultures are obtained intraoperatively to direct subsequent specific drug selection.

This patient was initially treated with intravenous ceftriaxone, metronidazole, and vancomycin. Intraoperatively, 75 mL of purulent material was drained. A Broviac catheter was subsequently placed, and outpatient treatment was continued for 8 weeks. Cultures grew *Streptococcus milleri* (viridans group) and a heavy growth of a mixture of *Peptostreptococcus* and *Fusobacterium* species with aerobic alpha *Streptococcus* (but not *Enterococcus* or pneumococcus).
Eosinophilic granuloma (Langerhans cell histiocytosis) is the most common cause of an acute acquired tender skull mass in children. These osteolytic lesions typically affect children aged 5 to 10 years but can affect persons aged 2 to 30 years. The lesions are usually well circumscribed, tender, firm, and nonfluctuant. Rarely, patients present with fever and leukocytosis. The lesions arise in descending order of frequency in the calvarium (50% of patients), mandible, ribs, long bones of the upper extremity, pelvis, and vertebrae. About 20% of patients have lung involvement that ranges from subtle alveolar patterns and solitary nodules to frank pulmonary fibrosis and honeycombing. Within the first 4 years after eosinophilic granuloma is diagnosed, there is a 42% risk of diabetes insipidus.

Biopsy specimens of eosinophilic granulomas are usually obtained percutaneously and are occasionally removed by excisional curettage to confirm the diagnosis and to distinguish the lesions from malignancies. The condition usually resolves spontaneously, and patients have an excellent prognosis.

A kerion is an exacerbation of tinea capitis characterized by the development of central pustules, erythema, induration and, on occasion, abscesses. Focal areas of scaly scalp and alopecia suggest the diagnosis. Kerions are treated with the same regimen as tinea capitis. Some authors recommend the addition of prednisone for 1 to 2 weeks. If a bacterial superinfection develops, dicloxacillin or cephalixin may be added.

A galeal hematoma may occur with any trauma. A thorough history of traumatic events must be taken and critically examined to identify the cause. A hematoma may produce overlying erythema and focal tenderness. Low-grade fever may occasionally be present. Although galeal hematomas are common in newborns and toddlers, their presence should raise concerns about abuse. A scalp hematoma may be the solitary finding in patients with serious underlying pathology, including skull fracture, intracranial hemorrhage, and cerebral contusion. Hematomas therefore require a thorough physical examination and, depending on the child's age and the mechanism of injury, imaging studies. Large hematomas from minor trauma may be sentinel manifestations of undiagnosed coagulopathies.

**References: FOR MORE INFORMATION:**


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