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Case Report

Potts Puffy Tumour- a Diagnosis not to be Forgotten

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Abstract

An 80-year-old women, with a history of chronic rhinosinusitis, presented to the Accident and Emergency department with a one week history of right sided supra and infraorbital swelling, tenderness and erythema. Her symptoms began with swelling and erythema above her right eye. This spread to involve the right infraorbital region and across the right side of her right cheek.

Examination revealed a boggy tender swelling in the supraorbital region with surrounding erythema, confirmed to be a Potts Puffy tumour on Sinus CT.

She was managed with Intravenous antibiotics, analgesia, nasal douches and decongestants and the lesion was treated surgically with incision and drainage. The patient was well post-operatively and at initial follow-up. Frontomaxillary balloon sinuplasty was performed two months later and the patient reported good symptomatic relief at 6-month review.

Background

Pott's Puffy Tumour (PPT) is a rare clinical condition first described by Sir Pervical Pott in 1760 [1] as 'a puffy, circumscribed, indolent tumour of the scalp, and a spontaneous separation of the pericranium from the scull (sic.) under such a tumour' [2]. It is defined as a subperiosteal abscess of the frontal bone with associated osteomyelitis. It can arise as a result of trauma or, more commonly, from chronic frontal sinusitis.

Chronic Sinusitis is a common condition with a prevalence of approximately 11% in the United Kingdom [3]. Alongside periorbital cellulitis; orbital, epidural, subdural and cerebral abscesses; meningitis and cavernous sinus thrombosis, PPT is one of the more serious complications of sinusitis. Although the prevalence and mortality from PTT has reduced considerably since the advent of antibiotics [4], prompt recognition and treatment is important to prevent disastrous progression of the condition.

We describe a rare case of PTT in an elderly patient with a history of Chronic Sinusitis. The case illustrates how the rare and subtle presentation of PTT challenges its prompt diagnosis. Although few clinicians will have encountered the condition, it is important remember PPT as a differential in children and adults with a history of chronic sinusitis presenting with a new forehead swelling and to investigate and manage them accordingly.

Case Presentation

An 80-year-old woman presented to the Accident and Emergency department with a one week history of right sided supra and infraorbital swelling, tenderness and erythema. Over this time the supraorbital swelling had developed a central prominence that had produced a discharging sinus, healed with a scab at presentation. She was afebrile and systemically well. She was otherwise fit and well, with no history of diabetes, immunosuppression or smoking and on no regular medications.

On examination, all eye movements were normal and there was no conjunctival ecchymosis. A boggy tender swelling with surrounding erythema was noted in the supraorbital region with a central scab over the most prominent erythematous area (Figures 1-4). Anterior and posterior Rhinoscopy via flexible nasendoscope was unremarkable.

Further questioning revealed this to be the third recurrence of these symptoms in the past year, with previous episodes resolving after 1-2 weeks without medical intervention. She reported a history of nasal congestion and rhinorrhea for which she had tried topical

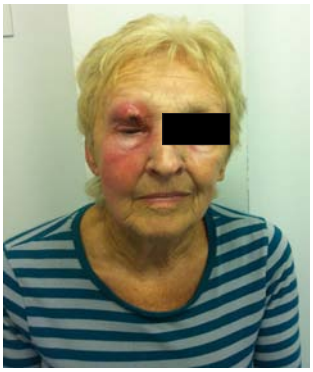

Figure 1: Front-on view of Ms IM.

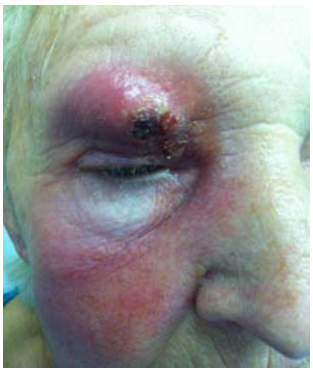

Figure 2: Close-up view of Ms IM.

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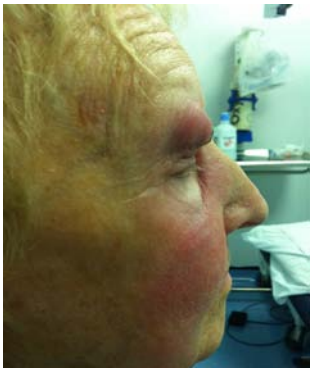

Figure 3: Right Lateral view of Ms IM.

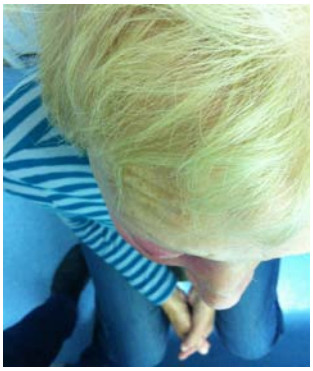

Figure 4: View of Ms IM from above.

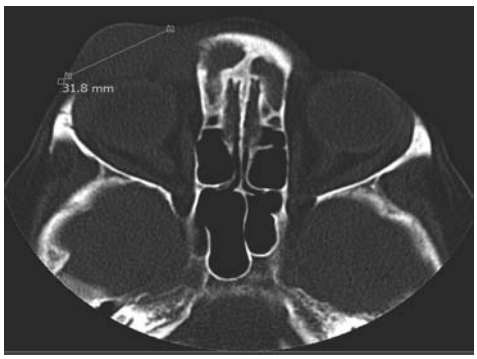

Figure 5: CT (Coronal view) Demonstrating the 3.2 cm Potts Puffy Tumour.

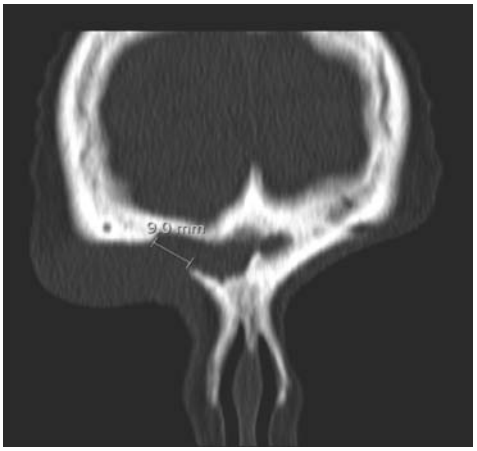

Figure 6: CT (Sagital view) Demonstrating a 9 mm defect in the frontal bone.

therapies for Chronic Rhinosinusitis with little relief and was awaiting review in the ENT clinic and consideration for sinus surgery.

Her inflammatory markers were not elevated (WCC 7.9x 109 g/L, Neutrophil count 5.8 x 109 g/L, CRP: 9.0 mg/L). She was initially treated with Intravenous antibiotics (ceftriaxone and metronidazole), analgesia, nasal douches and decongestants and a Sinus CT was requested (Figure 5 & 6).

CT showed a 3.2 cm soft tissue swelling anterior to the right globe in continuity with the right frontal sinus through a 9mm defect in the frontal bone. A diagnosis of a right frontal sinus mucocele with PPT was made and the patient was prepared for theatre the following day.

The subperiosteal abscess was drained externally via an incision over the supraorbital swelling, through the original defect and the discharging fluid was sent for microscopy, culture and sensitivities. The sinus was irrigated with normal saline and a corrugated drain placed.

Investigations

Hb: 114 g/L

WCC: 7.9 x 109 g/L

Neutrophil count: 5.8 x 109 g/L

CRP: 9.0 mg/L

Sinus CT: There is significant soft tissue swelling anterior to the right globe and separate from the globe itself. This measures approximately 3.2 cm in diameter and appears oval in shape. A collection in this location cannot be excluded. This soft tissue opacity is in continuity with the right frontal sinus through a 9 mm defect in the bony wall of the superior orbit. Both the right and left frontal sinuses are entirely opacified as well as the anterior and middle ethmoid sinuses bilaterally and the left maxillary sinus. The left osteomeatal complex appears occluded; the right osteomeatal complex appears patent.

Outcome and Follow-up

The patient was well post-operatively and noted improved pain almost immediately following recovery. The erythema improved and the corrugated drain was removed after 36 hours. The patients' post-operative care included 6 weeks of oral Co-Amoxyclav, as per microbiology advice, one week of Otrovine decongestion followed by two weeks of Betamethasone drops and she was discharged three days after surgery.

Initial review two days after discharge showed good progress, which continued at consultant post-operative review ten days later. She was assessed one month later and listed for endoscopic sinus surgery. Day case balloon sinuplasty was performed and all four sinuses were successfully cannulated and the sinus ostia dilated. She was discharged on nasal douches and a three-week course of betamethasone drops. The patient reported good symptomatic relief at initial and six-month follow-up. The site of original incision and

drainage was completely healed and no complications of either surgery were reported.

Discussion

This case demonstrates how chronic sinusitis could develop into a more complex clinical condition and reminds us of a serious but rare complication. Sinusitis refers to inflammation of the paranasal sinuses, which results in increased vascular permeability, impaired ciliary function, oedema and hypersecretion of mucus. These inflammatory processes result in the patient experiencing sneeze, cough, nasal discharge, ear fullness, facial pressure and dizziness [5]. When these symptoms last for over 12 weeks the sinusitis is termed as chronic [6].

In patients with chronic sinusitis, polymicrobial infection is common [7], broad spectrum antibiotics should therefore be used. Cases that are refractory to antibiotics should be considered for surgical drainage.

As many of the complications of chronic sinusitis are associated with anaerobic bacteria, their presence should cause concern [8]. Complications include mucocele formation, periorbital cellulitis, PPT, meningitis, thrombophlebitis of intracranial vessels, local and intracranial abscesses. These complications result from spread of the infection to which children and adolescents are more susceptible.

The frontal sinuses become pneumatised from the age of 6 and develop into their adult configuration by the age of 15 [9]. There is also a peak in diploic venous circulation during adolescence [10,11]. These veins do not contain valves and therefore provide a means for infection to travel from the sinuses to the subgaleal space, resulting in frontal bone osteomyelitis. Children and adolescents, given their developing frontal sinuses and peak diploic vascularity, are particularly vulnerable to developing PPT and other complications following sinusitis. This is reflected by fact that the majority of case reports of PPT feature young patients [12]. Our case however is a reminder that this is not an exclusively paediatric clinical entity and the diagnosis should be considered early in a patient with a history of chronic sinusitis as this presents a surgical emergency.

Patients with PPT present with a tender, fluctuant swelling of the forehead and may complain of headache, fever and a purulent discharge [12]. In such patients, PPT cannot be ruled out until appropriately investigated. Haematological parameters may reveal elevated inflammatory markers. As shown in our case, this is not always evident [13], and a contrast enhanced CT of the sinuses is required for diagnosis or exclusion.

CT is preferred to MRI as it provides superior visualization of bone and in cases of PPT this would typically demonstrate opacification of the frontal sinus [14] with stranding and swelling of the overlying scalp [15]. Bone algorithm often demonstrates a defect in the anterior wall of the sinus. Contrast may demonstrate a focal abscess, and may also allow intracranial complications to be better delineated [15].

Prompt treatment with intravenous broad spectrum antibiotics is essential to cover for polymicrobial infection [16]. Most patients also require surgical drainage of the collection to drain the affected sinus and excise infected bone [12]. A prolonged course of antibiotics is appropriate for patients with abscess and osteomyelitis [17]. With appropriate treatment, most patients go on to make a full recovery [18]. However, PPT can cause complications as a result of extension from the subperiotsteal space of the frontal bone. The subperiosteal abscess can extend thorough the posterior wall of the sinus and may involve underlying dura forming an extradural empyema. Further spread through small vessels traversing the dura may result in subdural empyema, subarachnoid inflammation or involvement of brain parenchyma [18].

An external approach with incision and drainage was taken in this case and definitive sinus surgery performed after a short interval period. This was deemed appropriate in this elderly patient. Simple drainage and irrigation was feasible as there was a 9mm dehiscence of the frontal wall of the sinus and she was a candidate for minimally disruptive sinus surgery with balloon sinuplasty.

Learning Points/Take Home Messages

- Potts Puffy tumour is a rare complication of chronic rhinosinusitis presenting as a fluctuant swelling on the forehead and should be considered in patients of any age.
- Patients with PPT may have normal inflammatory markers and appear systemically well.
- Investigation is via a contrast enhanced sinus CT which shows opacification of the frontal sinus stranding and swelling of the overlying scalp with or without a defect in the anterior wall of the sinus.
- Treatment is via broad spectrum IV antibiotics and surgical drainage.
- If untreated PPT can result in serious complications including subdural empyema, subarachnoid inflammation or involvement of brain parenchyma.

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