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Pott's Puffy Tumor: a Case Report

Kamran Khan, Sameed Qureshi*

[1]*Department of medicine and allied, Northwest General Hospital and Research Centre, Peshawar, Pakistan.*

***Corresponding author:** Sameed Qureshi, Department of medicine and allied, Northwest General Hospital and Research Centre, Peshawar, Email: sameedqureshi92@gmail.com.*

ABSTRACT

Pott's puffy tumor is a rare clinical phenomenon characterized by subperiosteal abscess manifests primarily as a non-neo plastic complication of frontal sinusitis or as an aftermath of head trauma. Herein, we report a 65-year-old hypertensive female diagnosed with pott's puffy tumor. She presented to us with altered mental status and seizures. Radiological scans revealed left sided frontal and ethmoidal sinusitis with overlying focal swelling of the scalp and intracranial extension of the infective process. The patient was treated conservatively with antibiotic and antiepileptic. The condition is often difficult to diagnose based on clinical presentation. The treatment is surgical drainage followed by subsequent antibiotic use. This case report however highlights that only medical management may be feasible if patient is monitored strictly for any worsening neurological squeal and patient is placed under a strict antibiotic regimen.

Keywords: *potts puffy tumor, sinusitis, complication*

INTRODUCTION

Pott's puffy tumor is characterized by a subperiosteal abscess with associated osteomyelitis originating from the frontal sinus. It is a rare complication of sinusitis, malignancy, mastoiditis or an insect bites. [1] It has a high risk of intracranial complications such as meningitis if not recognized early and appropriately treated. Although it is more common in the pediatric age group, there are few cases reported in the adult population as well. [2]

This condition is often unrecognized and difficult to diagnose based on clinical presentation. It manifests as a non-neo plastic complication of acute frontal sinusitis. Frontal sinusitis usually runs a silent course, and if it manifests physically, is often presented by nonspecific symptoms such as headache, fever and nasal discharge. CT scan and MR imaging are means to diagnose this condition and detect progression into intracranial complications such as meningitis, focal abscess or thrombosis. The CT scan shows swelling of the bone overlying frontal sinus. Treatment depends on the surgical intervention, specifically endoscopic sinus surgery or craniotomy followed by broad-spectrum antibiotic therapy. Herein, we had a 65-year-old-lady presented with altered mental status and seizure. Subsequent investigations and CT reported Pott's puffy tumor. She was treated conservatively with antibiotics and antiepileptic with complete resolution. Pott's Puffy tumor is usually considered a surgical emergency; however it can also be treated conservatively given the right context, as highlighted in this particular case.

CASE REPORT

A 65-year-old lady was presented to Northwest General Hospital, Peshawar in the month of January 2019, with a four-day history of altered mental status and fits. The caretakers denied any loss of consciousness, headaches or vomiting. A review of systems was negative for visual changes, weakness, numbness, tingling or nuchal rigidity. The patient was febrile with a temperature of 100°F and high blood pressure of 200/100 mmHg both arms. Neurological examination showed a drowsy state and disoriented in time and space. Pupils were equal and reactive. Motor and sensory was intact, meningeal signs negative. Fundi were within normal limit. Rest of the systemic examination was normal. Her past medical history was significant for recently diagnosed hypertension and recent admission with pyogenic meningitis. The patient was admitted in our set-up in medical intensive care unit one month back with high grade fever, vomiting and altered mental status. During that admission, she had signs of raised ICP. CT scan showed punctate hemorr

hages and suspected meningitis and lumbar puncture was in favor of pyogenic meningitis. She was treated conservatively with vancomycin, ceftriaxone and ampicillin. Her fever and altered mental status resolved, and she was sent home vitally stable. Laboratory investigations on admission were notable for peripheral leukocytosis with total count of 25.0 x 10^12/l and marked neutrophilia (absolute count of 22.12 x 10^12/l). Electrolytes had hypokalemia of 2.36 mg/dl, CRP 13.04 mg/dL and calcium magnesium normal. Urinalysis, liver function tests, renal profile, pan cultures were normal. Her laboratory results are shown in Table 1.

Table1. *Relevant investigations done.*

Laboratory Investigations	Value	Normal Range*
Hemoglobin	14.95	13-18 g/dL
Red blood cell count Hematocrit	5.01	4.5-5.5x10^12/L
MCV	41.20	40-54%
Platelets	82.10	83-101 fl
	180.40	150-450x10^9/L
White cell count *Differential Leukocytes*	25.72	4-11x10^9/L
Neutrophils	22.12	1.65-8.25 x10^9/L
Lymphocytes	2.31	0.8-4.95 x10^9/L
Eosinophils	0.26	0.04-0.66 x10^9/L
Monocytes	1.03	0.24-1.1 x10^9/L
Other tests	0.94	0.2-1.2 mg/dl
Creatinine	106	110-165 mg/dl
Random glucose	12.4	10.0 sec
PT	16	10-40 U/L
ALT	Not seen	0-15 mm/hr
Malarial Parasite	18	7.51 mg/dl
ESR	13.04	8.5-10.5 mg/dl
CRP	9.1	
Calcium	Non-Reactive	
HCV Antibody	Non-Reactive	
Hbs Ag	Non-Reactive	
HIV Antibody	No growth	
Blood culture	No growth	
Urine culture	Normal	
Urine R/E	Colorless	
CSF R/E	3.0 ml	
Color	Nil	
Quantity	60	
Clot	43.3	
Glucose	485	
Total Protein	33	
R.B.C	20 %	
T.L.C	80 %	
Polymorphs	No microorganism seen	
Lymphocytes	No AFB seen	
Gram Staining		
Ziehl-Neelsen Stain		

** Normal values for male, MCV = mean corpuscular volume, PT= Prothrombin time, ALT = alanine aminotransferase, ESR= Erythrocyte Sedimentation rate, CRP = C-reactive protein*

Radiological evaluation had CT normal brain study. MRI brain (Figure 1) reported left sided frontal and ethmoidal sinusitis with overlying focal swelling of the scalp.

Intracranial extension of the infective disease was noted which was characterized by linear enhancement of the dura matter anteriorly along the left frontal lobe and falx. Additionally peripherally enhancing collection noted overlying the left frontal lobe which was suggestive of epidural infective collection. The underlying brain parenchyma appeared unremarkable with no radiological evidence of cerebritis or intra cerebral abscess.

An ill defined high signal was noted in the left sided basal ganglia evident on T2WI only and minimal fluid was noted within bilateral mastoid air cells.

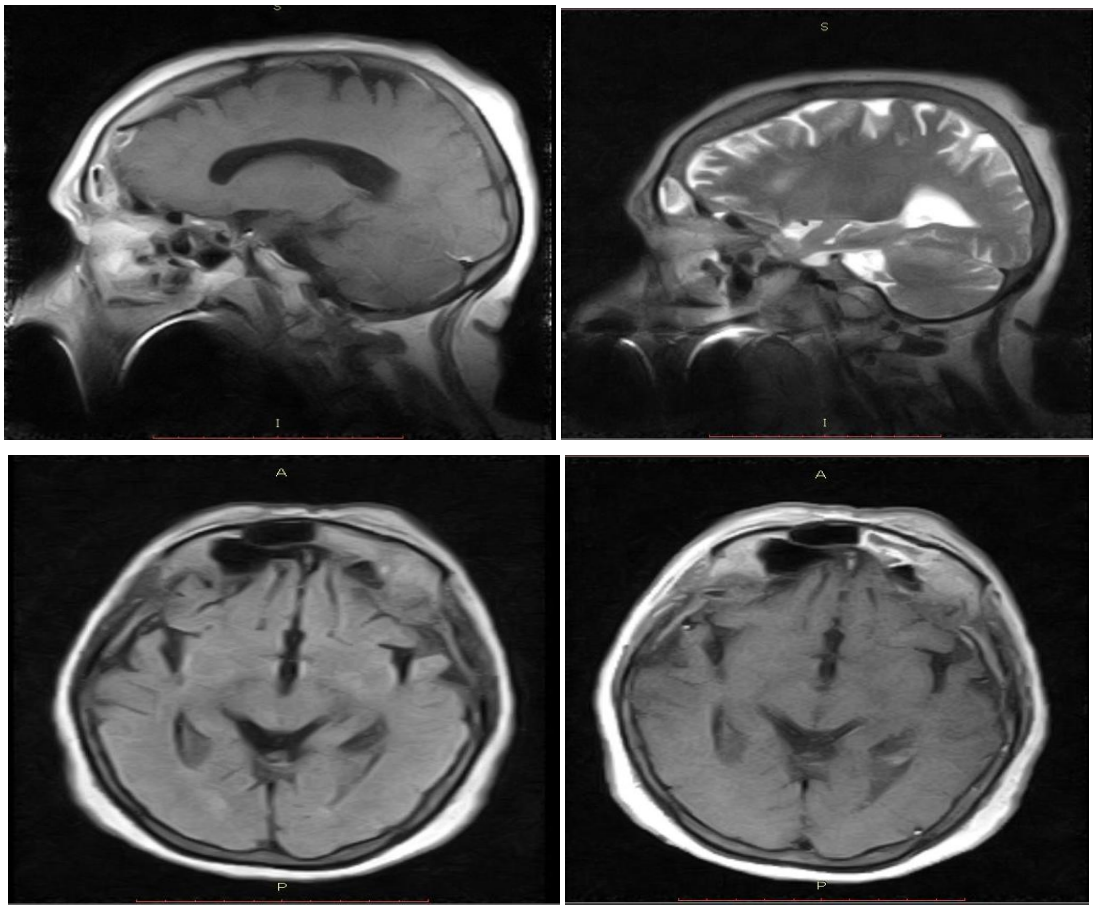

Figure1. *MRI Scan showing left sided frontal and ethmoidal sinusitis with overlying focal swelling of the scalp and intracranial extension of the infective disease involving the dural meanings along the left frontal lobe and falx and a peripherally enhancing collection overlying the left frontal lobe.*

The patient was treated conservatively with vancomycin and ceftriaxone. Antiepileptic for seizures and aggressive blood pressure was controlled high dose hydrochlorthiazide, lisinopril and calcium channel blockers. This was followed by dramatic improvement of fever and the neurological manifestations. Her leukocyte count normalized and the patient was discharged on antibiotic. The patient has been on regular follow-up and showed a marked improvement. Her post-op scan after two months showed normal brain study.

DISCUSSION

Pott's puffy tumor is a rare condition first described by Sir Percival Pott in 1768. It is characterized as a circumscribed swelling of the forehead indicating an underlying osteitis of the skull or an extra Dural abscess which may be the result of trauma or infection such as acute/chronic sinusitis. When not treated promptly, osteomyelitis of the frontal bone and the resulting subperiosteal abscess gives rise to the characteristic Pott puffy tumor. [3] The patho physiology depends on the anatomy of the frontal sinus. As sinusitis is the main causative to the development of Pott's puffy tumor, the condition is thought to arise through several mechanisms which include retrograde spread from the diploic veins that drain the sinus as well as direct extension through various anatomical pathways. [4] Microorganisms erode through the posterior part of the frontal bone and causes subsequent complications including meningitis, epidural, and subdural abscess. [5] The subperiosteal abscess results in swelling of the forehead giving the condition its "puffy" nature. Microorganism which is frequently responsible for the sinusitis and ultimately the condition includes Staph aureus, oral anaerobes, streptococcus, hemophilus influenza, klebsiella and enterococci. [3] A high index of suspicion is necessary to diagnose this rare condition. The clinical picture is vague, the patient usually present with headache, nausea or sometime acute febrile illness. A CT scan with contrast and MRI should be done to confirm the diagnosis and rule out intracranial complications. When diagnosed, the patient must be admitted and put on broad-spectrum intravenous antibiotics and analgesics. Treatment of Pott's puffy tumor is based on surgical drainage of the abscess,

debridement of necrotic material and antibiotic therapy for 6 to 10 weeks. [6] Neurosurgical consultation is required in case of intracranial involvement. To address the subsequent neurological symptoms and control spread of infection, a craniotomy with sinus and abscess drainage is usually required. In our case however, patient recovered with antibiotic regimen that controlled infection and avoided the need to undergo neurosurgical intervention. Typically, craniotomy is clearly indicated in the setting of abscess, CNS infections and for evacuation of pus and decompression of underlying cerebral hemisphere [6]. As more cases are reported, larger studies may improve our understanding of the risk factors for this disease and methods to prevent it. No optimal treatment has been established yet for this rare infection. There have been some reports of clinical improvement with conservative therapy alone; most patients with intracranial complications have received a combination of surgical and medical therapies. In conclusion, a Pott puffy tumor, although very rare in this modern era of antibiotics, may still occasionally be seen. When diagnosed, it should be treated promptly with broad-spectrum intravenous antibiotics for 4 to 6 weeks; surgical intervention may also be necessary, depending on the radiological findings. Prompt diagnosis and proper treatment will decrease the morbidity and mortality associated with this rare condition.

Conflict of Interest

A written consent was taken and the authors Declare that there is no conflict of interests regarding the publication of this paper.

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