

A rare case of rhinosinusitis: Three different complications in a patient

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Abstract

The aim of this study is to describe the management of three different complications associated with rhinosinusitis which developed simultaneously in the same patient. A 27-year-old man visited the emergency department with complaints of headache and swelling of the left eye. He had sustained a blunt head injury 1 month earlier. He was diagnosed with preseptal cellulitis, subdural abscess, and Pott's puffy tumor which was shown to be a result of rhinosinusitis after physical examination and imaging. After surgical and medical treatment, he was followed up without further complications. Complications of acute rhinosinusitis are very uncommon in the antibiotic era. Patients may suffer life-threatening outcomes if complications develop. A prompt multidisciplinary approach must be immediately established by otorhinolaryngologists, ophthalmologists and other specialists of relevance in order to diagnose and treat life-threatening complications.

Keywords: Complications; Pott's puffy tumor; rhinosinusitis; subdural abscess

INTRODUCTION

The European Academy of Allergy and Clinical Immunology defines acute rhinosinusitis as 'inflammation of the nose and the paranasal sinuses characterized by two or more of the following symptoms: blockage/congestion, discharge (anterior or postnasal drip), facial pain/pressure and reduction or loss of smell lasting less than 12 weeks'. Additional symptoms such as toothache and fever facilitate clinical diagnosis (1). Acute rhinosinusitis is estimated to affect more than a billion persons worldwide annually, which is 6%–15% of the world's population (2). Owing to the widespread use of antibiotics, the complications associated with acute rhinosinusitis are less common. However, some patients with this condition still suffer from these complications because of delayed diagnosis and treatment. Patients can have a wide range of complications, which can be categorized as orbital and intracranial complications (3). It is of utmost importance to treat these complications early to save lives.

In this article, we present three complications (one intraorbital and two intracranial) that were observed in the same patient along with their findings and the treatments provided in light of the literature. In the literature, the number of cases with multiple complications in the same patient with acute rhinosinusitis is limited. Therefore, we think that our article will contribute to literature.

CASE REPORT



Figure 1. Initial examination findings of the patient; white arrow indicates swelling on the left frontal bone of PPT; black arrow indicates oedema and hyperaemia around the left eye

Received: 08.05.2020 **Accepted:** 30.10.2020 **Available online:** 19.11.2020

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A 27-year-old man was admitted to the emergency department with complaints of headache and swelling of the left eye, which progressively increased for 2 weeks. He had sustained a blunt trauma injury to the left frontoparietal area 1 month earlier, and he did not see a doctor after the trauma. No significant family history was identified. He was conscious, oriented, febrile and he had also tachycardia. Physical examination revealed purulent nasal discharge from the left nasal cavity, slight hyperemia and edema in the left eyelids, and a swelling approximately 3×3 cm in size on the left frontal bone (Figure 1). His visual acuity, fundoscopic examination and eye movements were normal.

The laboratory results revealed that his white blood cell (WBC) count was 15.8×10^3 cells/ μL , hemoglobin level was 13.5 g/dL, and C-reactive protein level was 142 mg/dL, and other biochemical parameters were normal. Computed tomography (CT) of the paranasal sinus revealed left maxillary, anterior ethmoid and frontal sinusitis and a subperiosteal abscess on the left frontal bone (Figure 2A). He was hospitalized after having been diagnosed with Pott's puffy tumor (PPT) and preseptal cellulitis caused by acute sinusitis. With the recommendation of infectious disease specialists, intravenous antibiotic treatment was started (cephtriaxone 2.0 g, two times daily; metronidazole 0.5 g, four times daily and vancomycin 1 g, two times daily) and preparations were initiated for abscess drainage and endoscopic sinus surgery.



Figure 2. A) CT image taken before treatment. Opacified image in the maxillary and ethmoid sinuses

On the first day of hospitalization, some apparent changes were observed in the patient's personality (aggression, treatment refusal, etc.). Neurology consultation was requested under the supervision of a psychiatrist. Magnetic resonance (MR) imaging revealed a subdural abscess of approximately 6 mm adjacent to the left parietal lobe, and no other intracranial complication was found (Figure 2B). Despite his earlier non-consenting attitude, the patient eventually consented to undergo surgery.

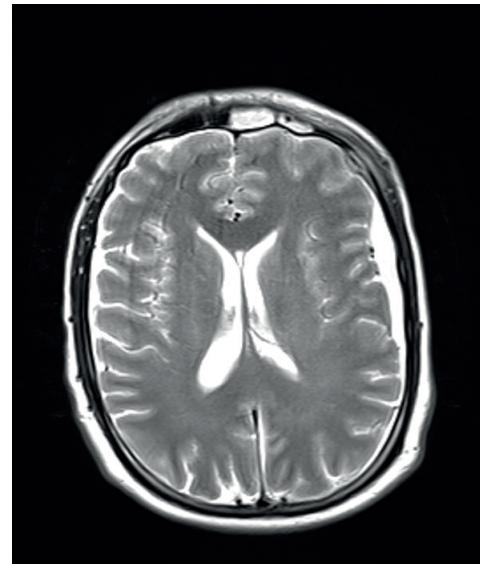


Figure 2. B) T2-weighted MR image taken before treatment. A subdural abscess adjacent to the parietal lobe is noted

The subdural abscess was drained by neurosurgeons using a burr hole procedure. Purulent secretion in the left maxillary, anterior ethmoid and frontal sinus was drained through endoscopic approaches, and frontal sinus trepanation was performed. Next, two tubes comprising the aspiration catheter was inserted through the trepanation hole. The first tube was inserted from the frontal sinus ostium into the nasal cavity and the second into the frontal sinus. The PPT was then drained through another incision made in the left eyebrow, a bacterial culture was taken, and a Penrose drain was placed. After washing the frontal sinus from the second tube for 5 days with an antibiotic (levofloxacin 250 mg/5 ml; twice daily), the tubes and Penrose drain were removed.

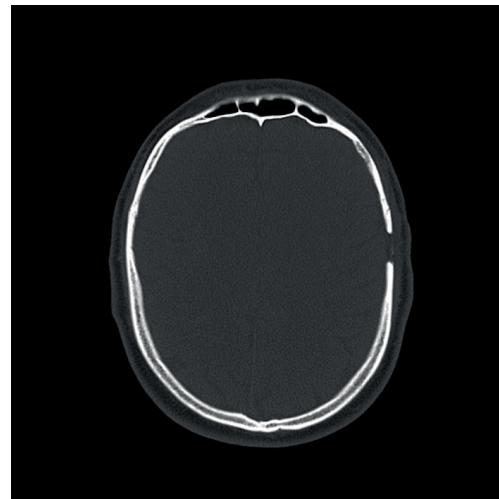


Figure 3. A) Control CT of the patient taken after treatment. No pathological findings were observed.

There was no growth in the bacterial culture taken from the PPT. The C-reactive protein level and WBC count decreased to the normal limit within 1 week. Three intravenous antibiotics were administered for 3 weeks to control the disease. Control CT showed no pathological

findings after 1 month. (Figure 3A). The patient's post-operative course was uneventful, and he had a complete recovery.

DISCUSSION

Although cases of complicated sinusitis are rare because of the widespread use of effective antibiotics, complications still occur and may lead to life-threatening outcomes. Complications associated with acute rhinosinusitis are categorized as intraorbital and intracranial complications (4). The Chandler classification system is used to classify the severity of intraorbital complications, these include five classifications: I, preseptal cellulite; II, orbital cellulitis; III, orbital subperiosteal abscess; IV, orbital abscess and V, cavernous sinus thrombosis (5). Suppurative intracranial complications of acute sinusitis include PPT, meningitis, epidural abscess, subdural abscess, intracerebral abscess and dural sinus thrombophlebitis (4,6). In our case, preseptal cellulite, PPT and subdural abscess were diagnosed simultaneously and developed due to acute sinusitis. To prevent these complications, the sinuses should be cleared using functional endoscopic sinus surgery and frontal sinus trepanation.

Preseptal cellulitis, classified as Chandler group I, is a bacterial infection of the eyelid and periorbital soft tissues which causes local erythema and induration and often manifests as fever, pain, conjunctival injection, epiphora and blurry vision. Preseptal cellulitis can be successfully managed with empiric systemic broad-spectrum antibiotics (4). In preseptal cellulitis, eye movements and eyesight are not compromised; however, without treatment, preseptal cellulitis may progress to more severe orbital complications (7). At his initial presentation, our patient had mild edema and hyperemia around the left eye as well as fever. To avoid intraorbital complications (subperiosteal orbital abscess, orbital abscess etc.), the patient was requested to consult an ophthalmologist. Because the patient's eye movement, visual acuity and fundoscopic examination were normal, preseptal cellulitis was considered and treated with antibiotics only. We believe that patients suspected with acute rhinosinusitis complications should be examined by ophthalmologists.

PPT was originally described by Sir Percivall Pott in the 1700s and is defined as one or more subperiosteal abscesses of the frontal bone. The infection that causes PPT is often caused by direct spread from the frontal sinus or thrombophlebitis of the diploic veins (8). Considering that the aforementioned patient had sustained a blunt head trauma injury 1 month earlier, we decided to focus on the direct spread of the infection (via incomplete fracture). CT revealed a suspicious area for the incomplete fracture line (Figure 3B). Therefore, we did not think that the infection had spread from the diploic veins. Antibiotic therapy was used with drainage to treat PPT. To avoid aesthetic concerns, the drainage incision was hidden inside the outer edge of the eyebrow.

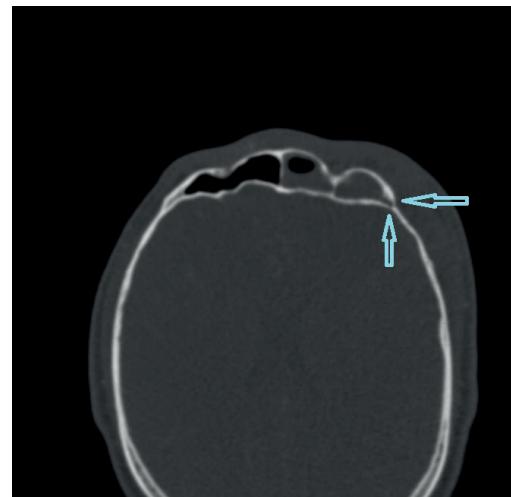


Figure 3. B) Blue arrows indicate incomplete fracture lines causing subdural abscess and PPT

The most common intracranial complication of sinusitis is subdural empyema, which occurs as an extension of acute or subacute frontal sinusitis. This complication mostly affects otherwise healthy adults (9). Giannoni et al. reported 12 cases of intracranial complications related to sinusitis. In these cases, headache, fever and mental status changes were reported as the most common symptoms (6), which are similar to those reported in our patient. If, after a thorough examination by a physician, the mental status change turns out to be merely feigning, a diagnosis of intracranial complications may be withdrawn. The physician should thus be meticulous and alert when conducting the physical examination and interpreting the findings.

It is equally important to note that subdural abscess can be seen, particularly with PPT (10). Our patient also had a subdural abscess with PPT. We evaluated the origin of the subdural abscess as an incomplete fracture line just like PPT (Figure 3B). Rapid progression of subdural abscesses can lead to increased intracranial pressure and subsequent neurologic deficits or even death. Therefore, prompt identification and surgical intervention are extremely important. As soon as we detected subdural abscess in our patient, we drained the subdural abscess and continued antibiotic treatment for 3 weeks. In brief, if a patient has PPT, we recommend intracranial imaging. We think that this procedure is important in the medico-legal context.

CONCLUSION

1. Acute rhinosinusitis complications are rare but life-threatening (especially intracranial complications). Therefore, ENT specialists should anticipate the possibility of simultaneous development of one or more complications.
2. It must be considered that personality change may be a sign of intracranial complications. In order to reveal this or other findings, the patient must be monitored closely.

3. Specialists from other departments (such as radiologists, neurologists/neurosurgeons, infectious disease specialists, and microbiologists) must be consulted to have a broader understanding of the disease as well as treat the complications of acute rhinosinusitis effectively.
4. Patients with complications of acute rhinosinusitis must definitely receive medical and/or surgical treatment.

Conflict of interest: The authors declare that they have no competing interest.

Financial Disclosure: There are no financial supports.

REFERENCES

1. Fokkens W, Lund V, Bachert C, et al. EAACI position paper on rhinosinusitis and nasal polyps executive summary. Allergy 2005;60:583-601.
2. Fokkens WJ, Lund VJ, Mullool J, et al. European position paper on rhinosinusitis and nasal polyps 2012. Rhinol Suppl 2012; 23: 3 p preceding table of contents, 1-298.
3. Goldberg AN, Oroszlan G, Anderson TD. Complications of frontal sinusitis and their management. Otolaryngol Clin North Am 2001;34:211-25.
4. Tara FC. Complications of sinusitis. Am J Rhinol Allergy 2016;30:241-5.
5. Chandler JR, Langenbrunner DJ, Stevens ER. The pathogenesis of orbital complications in acute sinusitis. Laryngoscope 1970;80:1414-28.
6. Giannoni CM, Stewart MG, Alford EL. Intracranial complications of sinusitis. Laryngoscope 1997;107: 863-7.
7. Kombogiorgas D, Seth R, Athwal R, et al. Suppurative intracranial complications of sinusitis in adolescence. Single institute experience and review of literature. Br J Neurosurg 2007;21:603-9.
8. Palabiyik FB, Yazici Z, Cetin B, et al. Pott puffy tumor in children: A rare emergency clinical entity. J Craniofac Surg 2016;27:313-6.
9. Nathoo N, Nadvi SS, van Dellen JR, et al. Intracranial subdural empyemas in the era of computed tomography: A review of 699 cases. Neurosurgery 1999; 44:529-35; discussion 535-6.
10. Kombogiorgas D, Solanki GA. The Pott puffy tumor revisited: Neurosurgical implications of this unforgotten entity. Case report and review of the literature. J Neurosurg 2006;105:143-9.