

Subdural Empyema: Late Complication of Head Injury

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Abstract

Subdural empyema is a rare intracranial infection. It warrants prompt management to reduce morbidity and avoid mortality. However, clinical and radiologic features may be subtle. Thus, a diagnosis of subdural empyema should not be ignored, especially in a patient with the history of head trauma. We present a case of an adult male with a subdural empyema, who presented with fever, headache and left sided weakness who suffered from head injury 2 years back. He had right frontal sinus fracture with cerebrospinal fluid leak from nose for 3-4 days that subsided. Intracranial complications, subdural empyema can be a delayed complication of head injury that is rare and should be considered.

Key words: Abscess, Head injury, Subdural empyema

INTRODUCTION

Complications of head injury such as subdural empyema are rarely seen, have long-term morbidity if not diagnosed and managed promptly and appropriately.^{1,2} The frontal region is the most common location, and it is caused by frontal sinus fracture and chronic frontal sinusitis associated to nasal polyposis. Meningitis and encephalitis are often the first diagnosis considered in this case, space-occupying lesions such as abscesses or subdural empyemas must be considered as well, in particular when there are neurologic deficits, altered mental status or seizures at presentation. We present a case of an adult male who presented with fever, headache, had history of cerebrospinal fluid rhinorrhea and head injury 2 years back, with subdural empyema.

CASE REPORT

A 32-year-old patient was admitted to the medicine department with complaints of a headache, and fever (on and off) since 3 weeks. 2 years back, he hit his head against a door and had watery discharge coming out of his

nose that stopped after 3-4 days, spontaneously without treatment.

On examination, the patient was conscious and oriented. His vital pulse of 84 beats/min, blood pressure of 120/80 mmHg and temperature of 101° F. Patient had no signs of meningitis, sinus tenderness, ear or nasal discharge. His neurologic examination revealed no abnormality except left hemiparesis. His white blood cell count was 16,200 cells/mm.

Diagnostic testing included an initial computed tomography (CT) of head that was suggestive of chronic subdural collection showing inappropriate mass effect resulting in effacement of right lateral ventricle with a midline shift of 8 mm to the left (Figures 1 and 2).

With the diagnosis of a subdural collection, the patient was then transferred to the department of neurosurgery, where a right parietal burr hole was done and purulent subdural collection with hemorrhagic tinge approximately 70 ccs was drained. Examination of the purulent discharge demonstrated no organisms on Gram stain or Zein-Nelson's stain, protein content was 5.2 g% and sugar 20 mg%. Cell cytology revealed 30-40 red blood cells per high power field with numerous pus cells.

As scan was suggestive of collection in right frontal sinus, Patient underwent drainage and packing of frontal sinus through transnasal route. On 10th post-operative day, the

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Figure 1: Pre-operative plain scan showing right fronto-temporo-parietal subdural collection with inappropriate midline shift



Figure 2: Computed tomography scan of head showing rent in posterior wall of frontal sinus

patient was discharged. The patient was asymptomatic and clinically improved at the time of discharge.

DISCUSSION

Subdural empyemas are one of the neurosurgical emergencies which require prompt recognition and early management to salvage a good functional neurologic outcome. Some of these lesions progress rapidly and may cause increased intracranial pressure leading patient to coma and if untreated with 24-48 h then will ultimately lead to death.^{2,3}

A subdural empyema is a known but rare suppurative complication of the anterior and posterior wall of frontal sinus fracture. Intracranial complications following head injury include subdural empyema, epidural abscess, intracerebral abscess, meningitis, and thrombosis of the cavernous and other dural sinuses. There are two potential

mechanisms for empyema subdural formation following an injury to the frontal sinus. The most common, a retrograde thrombophlebitis occurs via the valveless diploic veins, and seeds the subdural space and then the direct extension can occur from an infected sinus. Frontal sinusitis is the most common culprit in this instance. The close anatomic proximity of the sinus to the subdural space allows for this direct extension. Once the infectious process invades the subdural space, rapid clinical deterioration is expected.^{4,6} The subacute course and vague symptoms contribute to the risk of misdiagnosis or delay in diagnosis.⁷

The few common neurologic manifestations are seizures, altered mental status, and hemiparesis, but sometimes focal neurologic deficits may be present if there is an associated intracranial abscess.

Neurologic findings are particularly ominous, but when they are present, rapid neurosurgical intervention is necessary because these symptoms will worsen rapidly.³ Few of other nonspecific symptoms are nausea, vomiting, personality changes, meningismus, papilledema, cranial nerve palsies, and periorbital edema.⁸

Singh *et al.*⁹ found that 37% of patients with subdural empyemas had concomitant extracranial complications. Finding these extracranial complications before neurologic symptoms have developed will improve the likelihood of an uncomplicated outcome.^{4,6}

In current era where there is frequent use of CT scan, early diagnosis is much more likely to occur which contributed to the decreased mortality rate and long-term morbidity of suppurative intracranial infections.

CT scan should be done with intravenous contrast if there is a concern for an intracranial infection and if it is found to be negative, then subdural empyema is still considered. In this case, magnetic resonance imaging (MRI) must be done with gadolinium contrast to confirm the diagnosis.

Administration of the third generation of cephalosporin along with metronidazole and vancomycin is given to provide appropriate coverage against streptococci species and *Staphylococcus aureus*.^{5,8} Adjunctive seizure prophylaxis is recommended early, as well as seizures may be present in up to 20% of cases.^{3,9,10}

Historically, mortality from subdural empyema has been as high as 15-41% even with surgical drainage.^{3,7,11}

Certain antimicrobials have found to be significant in lowering the mortality rate, as subdural empyema was universally fatal prior to antibiotic use.

The frequent use of CT and MRI has helped in good way to decrease the mortality rate, with recent studies suggesting a mortality rate ranging between 6% and 15%.¹²⁻¹⁵

CONCLUSION

Patient of head injury with frontal sinus fracture can present with subdural empyema as a delayed complication.

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