

## Subdural Empyema (Case Report)

Rahmati Mohammad Bagher<sup>1</sup>, Mamishi Setareh<sup>2</sup>, Rezai Mohammad Sadegh<sup>3</sup>, Houshmandi Mohammad Mehdi<sup>4\*</sup>

<sup>1</sup>Department of Infectious Diseases, Pediatric Hospital Clinical research development unit, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

<sup>2</sup>Department of Pediatric, Tehran University of Medical Science, Iran

<sup>3</sup>Department of Pediatric, Mazandaran University of Medical Science, Iran

<sup>4</sup>Department of Pediatric, Hormozgan University of Medical Science, Bandar Abbas, Iran

\* Corresponding author's Email: mhoushmandi@gmail.com

**ABSTRACT:** Subdural empyema (SE) is a life-threatening infection, it accounts for about 15-22% of focal intracranial infections. The mortality rate approached 100% before the introduction of penicillin and has declined since that time. We report a case of 10-mo-old infant who was admitted with high grade fever and convulsion with diagnosis of bacterial meningitis, after 10 days due to continue of fever, Vomiting and revealed disturbance of neurological examination, CT showed a low density area in the hemispheric area. She underwent urgent surgical drainage of subdural empyema (Burr hole) followed by antibiotics therapy. She was discharged from our hospital without neurologic deficit.

**Key words:** Subdural empyema; Abscess

CASE REPORT

### INTRODUCTION

Subdural empyema is a collection of pus in the space between the outermost layers of the meninges, the dural and the arachnoid (Gormley et al., 1996). Subdural empyema is usually unilateral (Brennan., 1995; Tunkel., 2005). Mortality ranges from less than 10% if patients are alert at the time of admission to 75% if the patient is already comatose (Shepard et al., 2003) with immediate and proper treatment, overall mortality rates can be 10–20% (Brennan., 1995; Tunkel., 2005). Up to 15% of empyema is cryptogenic (Pathak et al., 1990) in infants and young children, Subdural empyema most often occurs as a complication of meningitis and it should be differentiated from reactive subdural effusion. In older children and adults, it occurs as a complication of Para nasal sinusitis, otitis media, or mastoiditis (Brennan, 1995). Subdural empyema is more common in males, who can account for up to 80% of cases. And about two thirds of patients are aged 10-40 years (Rich et al., 2000; Barkovich, 2000).

Common causative organisms are anaerobic and aerobic Streptococci, Staphylococci, Haemophilus influenza, and other gram-negative bacilli (Brennan, 1995). The most of Subdural empyema are caused by 'Streptococcus milleri group', which is now termed 'Streptococcus anginosus group' (SAG) (Nakao et al., 2001; Okayama et al., 2005). Because of its rarity, many medical professionals may not have encountered a case in recent years. Therefore the topic should be re-visited to remind physicians to be vigilant against it.

### Case history

The patient was a 10-mo-old infant with bacterial meningitis. She was admitted with high grade fever and convulsion and with diagnosis of bacterial meningitis, antibiotics therapy was started (Vancomycin and ceftriaxone). But after 10 days due to continue of fever, Vomiting and revealed disturbance of neurological examination (inability to sitting, standing and neck holding) referred to Children's Medicine center. A nonenhanced CT on admission showed a low density area in the hemispheric area. MRI showed a bihemispheric subdural empyema (Figure 1, 2 and 3).

Vancomycin, metronidazole and ceftriaxone were continued. Neurological deficits gradually improved, after she underwent urgent surgical drainage of subdural empyema (Burr hole) followed by antibiotics therapy. He was discharged from our hospital without neurologic deficit. We suggest MRI, a useful additional imaging modality for the diagnosis of interhemispheric subdural empyema that revealed mild ventriculomegaly due to subcortical atrophy.

CSF: WBC (2 lymph Glu:41 Pro:22 Smear: Negative culture: Negative)- CRP:3+ B/Cnegative CBC: WBC[14400 (PMN:60% lym:32% mono:6%)-Hb:7/4(11/2) - plt:714000 (375000)] subdural empyema drainage (Smear Negative culture: Negative).

### DISCUSSION

Stephanov et al. (1979) described Subdural empyema "as the most imperative of neurological emergencies", which, if not treated immediately, is associated with high risk of status epilepticus, spreading cortical venous and cortico venous sinus thrombosis, fulminating cerebritis, brain swelling, cerebral coning and

ultimately leads to death. Causes and Incidence: Chronic paranasal sinusitis, otitis media and mastoiditis are the main causes of Subdural empyema. Subdural empyema can develop following a cranial surgery or following a trauma, particularly in cases where there is a compound depressed fracture. Subdural empyema has been reported after secondary infection of a subdural effusion or hematoma. Facial or scalp infections, dental sepsis or meningitis have been reported to result in SDE. Subdural empyema can be in either the supra or infratentorial compartment or may extend into both the supra and infratentorial compartments (Green Lee, 2003; Hlaviv et al., 1994; Rich et al., 2000).

**Age and sex:**

Young males are commonly affected (Gormley et al., 1996).

**Clinical Manifestation:**

The commonest clinical presentation is a triad of fever, sinusitis, and neurological deficits, with a fulminant and rapid downhill course. (Gormley et al., 1996; Quraishi et al., 2006; Tewari et al., 2004; Greenlee et al., 2003). Other symptoms include headache, nausea/vomiting, first-time seizures, and mental-status changes. (Yilmaz et al., 2006; Tewari et al., 2004; Greenlee et al., 2003).

**Imaging Studies:** Cranial MRI is now the imaging study of choice. The sensitivity of MRI is improved by using gadolinium contrast medium. CT scan is the modality of choice if the patient is comatose or critically ill and MRI is not possible or is contraindicated (Weisberg, 1986; Moseley et al., 1984).

**Procedures:**

Lumbar puncture (LP) is currently contraindicated because of possible cerebral herniation from increased ICP (Haines et al., 1985; Obana et al., 1993).

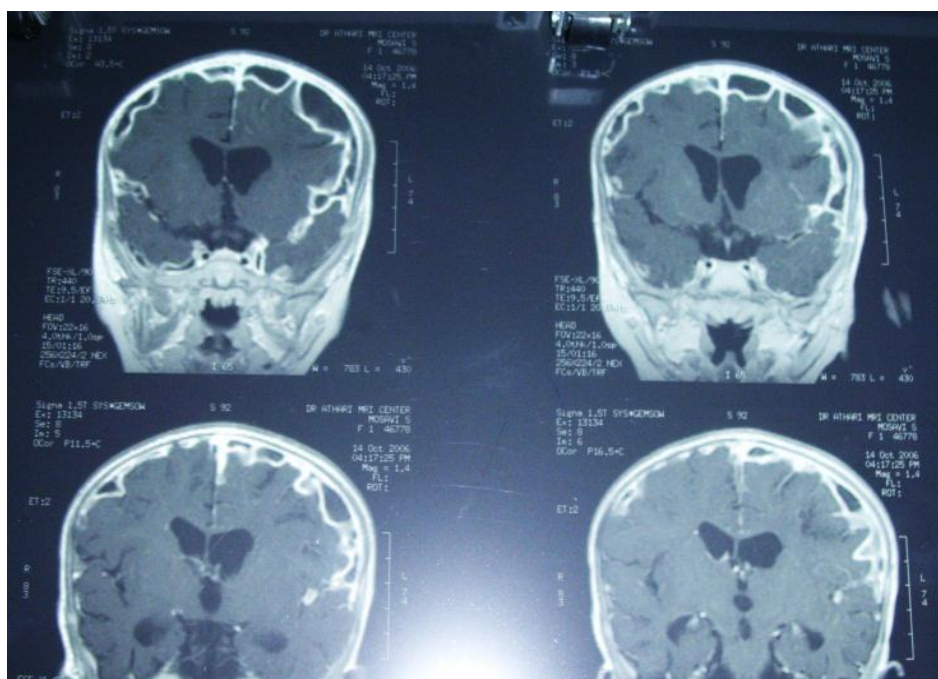
**Treatment:**

Antibiotic therapy as soon as possible with broad coverage for anaerobes, staphylococci, and aerobic streptococci. Antibiotic therapy alone may be adequate for small Subdural empyema (ie, <1.5 cm diameter). Because of the aggressive nature of this disease, however, this option is not widely utilized. The antibiotics should be given for a period of 3-6 week with close monitoring of clinical status (Mausser et al., 1987).

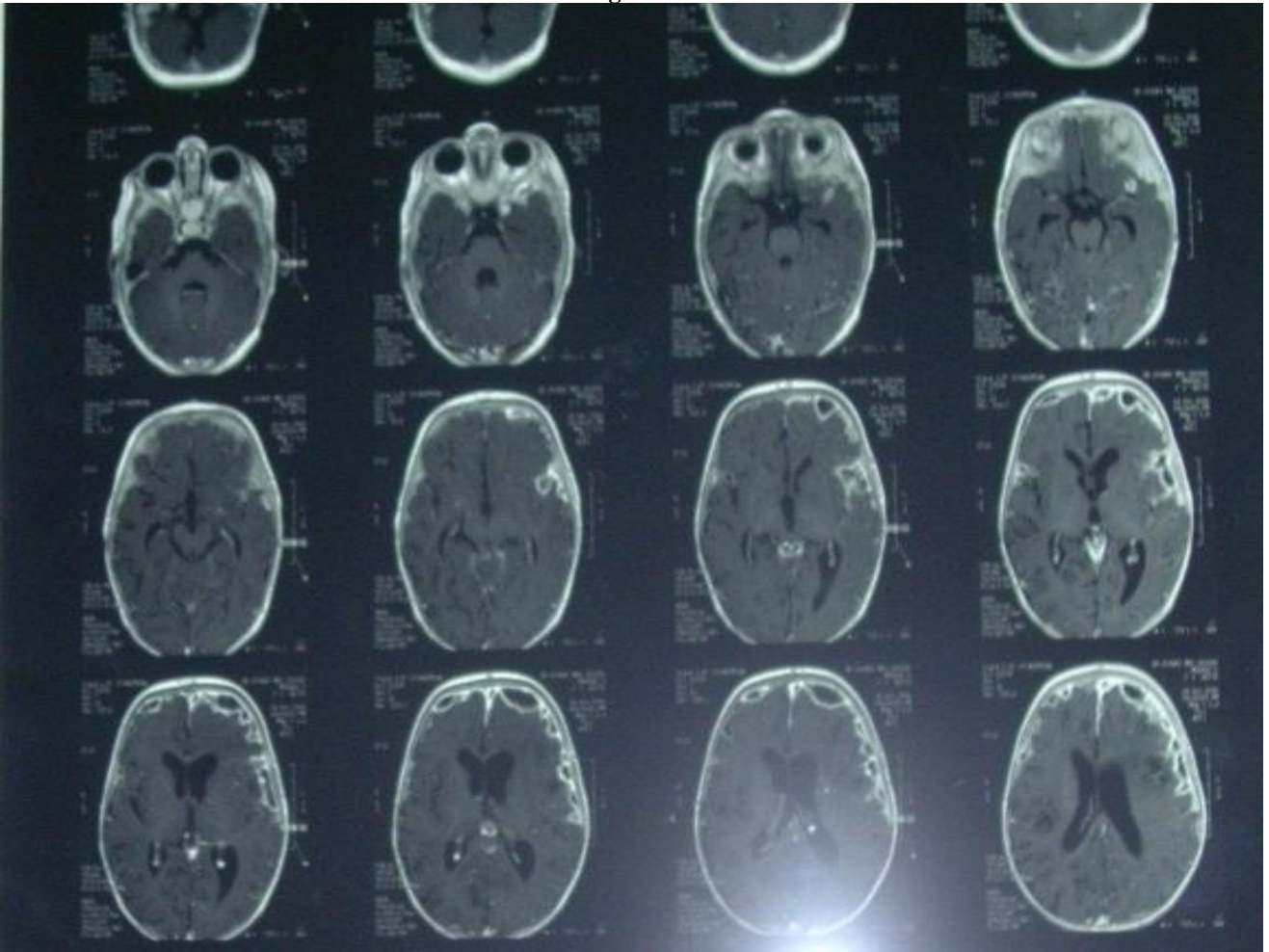
**Surgical Care:**

The primary surgical option is craniotomy, which allows wide exposure, adequate exploration, and better evacuation of the purulent collection than other procedures. Stereotactic burr hole placement with drainage and irrigation is another option but is less desirable because of decreased exposure and possible incomplete evacuation of the purulent material (Haines et al., 1985; Obana et al., 1993).

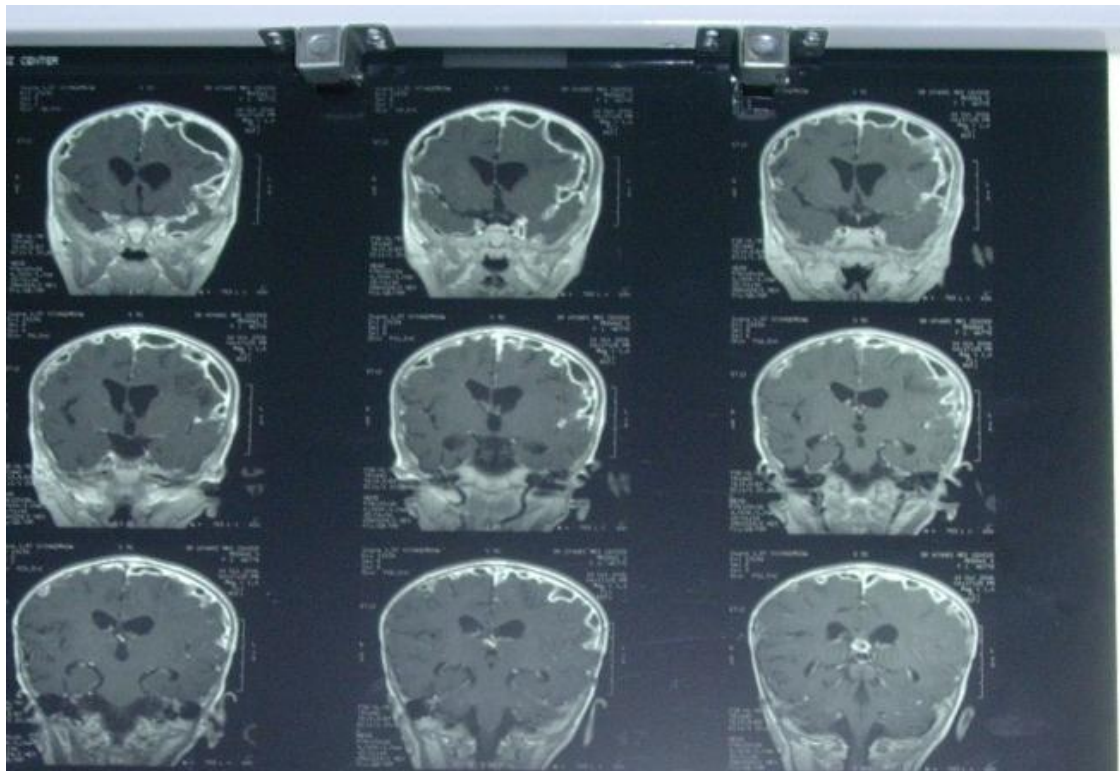
**Prognosis:** The mortality rate gradually is decreasing secondary to more timely diagnosis and intervention (eg, antibiotics, surgical drainage). (Mausser et al., 1987). Symptoms of Subdural empyema may be mild and can mimic sinusitis. Rapid recognition and treatment is importance. Brain MRI with gadolinium enhancement is the imaging study of choice (Adame et al., 2005; Greenlee et al., 2003); CT scan could be equivocal or normal in Subdural empyema (Mausser et al., 1987). The key to an early diagnosis mainly based on the patient's history and clinical presentation. Subdural empyema should be kept in mind, since early diagnosis and treatment is the most important way for a better outcome.



**Figure 1**



**Figure 2**



**Figure 3**

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