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SUBDURAL EMPYEMA IN CHILDREN PRESENTING WITH HEADACHE, VOMITING, LIMB WEAKNESS: CASE REPORT AND LITERATURE REVIEW

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AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration between all authors. Author RP collect the data and wrote the first draft of the manuscript. Authors DK and HP managed the literature searches. All authors read and approved the final manuscript.

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Case Study

ABSTRACT

Subdural empyema is an uncommon emerging case. We report case of subdural empyema in a12 years-old boy. The symptoms are right temporal headache, vomiting, and left limb weakness. Headache, vomiting and left limb weakness are acute. In CT-scan of the head, there is hypodense with HFU 30 on fronto temporo occipital dextra, edema cerebri, midline shift to the left and lateral ventricels constriction. Empyema evacuation was performed. The combination of cefotaxime and metronidazole are given. The condition is getting better. Patients discharged on day ten with a minor disability. A craniotomy is performed in this patient. Although craniotomy has been performed in patients, it does not rule out the possibility of recurrence.

Keywords: Subdural; empyema; craniotomy; limb weakness.

1. INTRODUCTION

Subdural Empyema (SDE) is an uncommon, the infection located between the duramater and arachnoidmater [1]. This disease is a rare occurrence that has been reported in 100 years. Although the incidence of SDE has decreased significantly with the increase in health service, antibiotic sensitivity and appropriate use of antibiotics [2]. Depending on the organism and patient's host immune, SDE can develop rapidly causing vascular ischemia it which causes neurological deficits in the event of delayed handling or improper handling. The most common of symptoms is fever, headache, and vomiting [3] Improving patient outcomes is critically dependent on rapid diagnosis, prompt initiation of appropriate antimicrobial therapy, and early surgical drainage [3]. Fast treatment is based on rapid diagnosis. The

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toughest challenge with the management of SDE is related to uncertain clinical symptoms of SDE which makes it difficult to diagnose [4]. While encephalitis and meningitis are often the first diagnoses considered in this case, subdural empyemas must be considered when there is a neurological deficit even though the case of subdural empyema is uncommon.

2. CASE REPORT

A 12 years-old female came to the emergency room with a right temporal headache, vomiting, and left limb weakness. A headache has been felt since 6 days ago. Vomiting and left limb weakness have been felt since 4 days ago. She had a fever 6 days ago and disappeared 2 days ago. The patient had an ear infection 5 years ago. There is no family member experiences similar symptoms like her. She denied any allergies and any head trauma. Her vital sign included a temperature of 36,4^{o}C, pulse of 76 x/min, respiratory rate of 22 x/min, blood pressure of 110/80 mmHg. His neurologic examination revealed 5/1 weakness in the left upper and lower extremity and Babinsky reflex is positive on a left leg. In these patients performed several investigations such as complete blood examination and CT-scan non-contrast of the head. On blood, examination found high levels of leucocyte 23.800 /mm [3], high levels of neutrophil segment 85%, and low levels of lymphocytes segmen 7%., high random blood glucose 234 mg/dl. In CT-scan of head there is hypodens with HFU 30 on fronto temporo occipital dextra, edema cerebri, midline shift to the left and lateral ventricels constriction. She started on intravenous Ceftriaxone 2x500 mg in the first day and increase dosage to be 2x1gr until 5 days, after that the antibiotic has changed into cefotaxime 3x1gr for 5 days, metronidazole 3x250 mg for 5 days, Dexamethasone 2x1amp, Mannitol 4x100cc in first day and then 3x125 in the next days during 5 days, tranexamic acid 3x250 mg for 1 day. She was admitted to Pediatric Intensive Care Unit with neurosurgical consultation. The patient was treated for 7 days after being operated on at PICU, the patient returned home in good condition, the consciousness improved, he was fully conscious, the patient was able to sit down, and the strength of the left extremity had increased.

3. DISCUSSION

Subdural Empyema (SDE) is usually caused intracranial pus between the duramatter and arachnoidmatter [5]. SDE could cause lifelong treatment in infants and children if it is not managed appropriately [6]. Subdural empyemas are neurosurgical emergencies that require rapid recognition and management to produce good neurological output. If not treated properly, SDE lesions develop rapidly and can cause increased intracranial pressure resulting in coma and death within 24 to 48 hours.

Neurosurgical procedure was the most common source of infection (44%), followed by sinusitis (28%) and otogenic sources (14%) [7]. This finding differs from other studies, in which sinusitis and otogenic sources account for higher proportions of infection sources [8]. The clinical features associated with SDE are often nonspecific, making diagnosis difficult for clinicians [3,9]. The most common triad of symptoms in this study was a headache, fever, and altered sensorium, which differs from the classical triad of a headache, fever, and vomiting more commonly reported in the literature [10]. In other studies, SDE in infants and children can cause symptoms of intracranial pressure, meningeal infection, and altered mental status. Some studies showed that 40% of patients with SDE present with seizures [11].

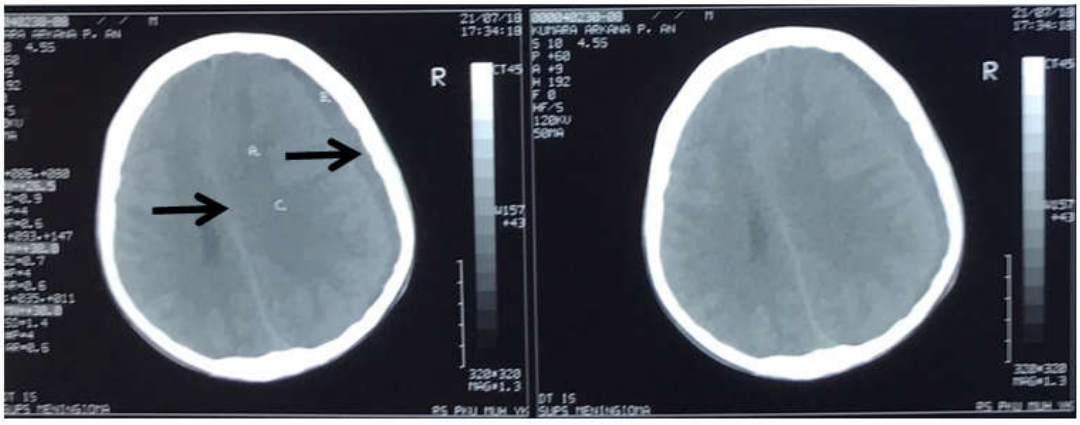

Fig. 1. CT-Scan pre-operation non-contrast revealed hypodense lessons on fronto-temporo-ocipital dextra with midline shift to the left and edema cerebri

SDE patients with sinusitis have extensive clinical symptoms, such as photophobia, tearing of the eyes, headache, and purulent rhinorrhea [12]. Suspicion for SDE in patients who present with any of the 4 most common symptoms headache, fever, altered sensorium, and vomiting especially patients who have had a neurosurgical procedure, sinusitis, mastoiditis, or chronic otitis media [7].

The aetiology organism of SDE is variable, it dependent on the source of infection. Common organisms associated with neurosurgical operations are Staphylococcus aureus and Propionibacterium acnes [8,13]. Streptococcus milleri and Fusobacterium necrophorum are common in patients with sinusitis, and Bacteroides fragilis and Staphylococcus aureus are common otogenic sources [10,14]. In this case, empyema culture has been carried out, but the results have not grown and no culture repetition has been carried out.

CT head scans with contrast are commonly used as the initial investigation in patients with suspected SDE because CT scans are readily available and results can be obtained rapidly [10]. In this era of frequent CT use, early diagnosis is much more likely to occur than previously, and this has likely played a role in reducing mortality and long-term morbidity from intracranial infections. CT-scan is typically the first-line choice because it is readily available and may show midline shift, oedema, and mass. CT-scan should be done with intravenous contrast if there is a concern for an intracranial infection. If it is still negative, and a subdural empyema is still doubtful, then the right choice is MRI with gadolinium contrast. MRI is the most sensitive test for intraparenchymal and intracranial infections and is considered the gold standard [15,16]. In other study found that CT has a 63% sensitivity for intracranial complications while MRI was 93% sensitive [16].

Management of SDE includes empirical treatment with broad-spectrum antibiotics. Management of SDE using the third generation of cephalosporin plus metronidazole and vancomycin to fight streptococcus and staphylococcus aureus species [15,16]. A combination of metronidazole, aminoglycoside, and a penicillin or cephalosporin was commonly used [10,16]. Seizures are common in patients with SDE, adjunctive seizure prophylaxis is recommended early as well, as seizures may be present in up to 20% of cases [17,18]. Management to reduce intracranial pressure such as using mannitol, elevation of the head of the bed and ventriculostomy can be done if needed.

Neurosurgical intervention such as burr hole or craniotomy is necessary in most cases to produce good opportunity at neurologic recovery [19]. Most of the literature has supported surgery, burr hole is a fairly simple technique that is widely used with overall morbidity up to 0-9% [20,21] There are two kinds of burr holes, one and two burr holes are usually drilled and the hematoma from the inside will spontaneously come out. A hematoma is irrigated several times using a salt solution with a nelathon catheter inserted from several directions until the irrigation is complete and clean. In the end, the drainage catheter is inserted and left in the hematoma cavity as drainage. Craniotomy is a more invasive technique compared to burr hole with higher morbidity. However, craniotomy as management has indications such as solid hematoma and recurrence [22]. In this case series, craniotomy had a lower SDE recurrence rate than burr hole and was the definitive surgical treatment in the majority (86%) of cases [6]. Benefits of craniotomy include partial excision of the wall of the abscess and the ability to leave the area of suppuration completely open [23].

4. CONCLUSION

Subdural empyema requires rapid diagnosis and rapid handling. Patients who present with subdural empyema sometimes have different clinical symptoms, in this case, the patient came with a right headache, left limb weakness, and vomiting. Investigations such as CT-scan and MRI are needed for patients who have a suspicion of SDE. In this case, the ct-scan image shows hypodense lesions in the front temporal occipital area. A craniotomy is performed in this patient. Although craniotomy has been performed in patients, it does not rule out the possibility of recurrence.

CONSENT

As per international standard or university standard, the patient's written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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