

## Chronic Subdural Hematoma with Contralateral Subdural Empyema

Sarbjit S Chhiber, Furqan A Nizami\*, Ashish Kumar, Altaf R Kirmani, Javeed Zargar and Anil Dhar

Department of Neurosurgery, Sher-i-Kashmir Institute of Medical Sciences, India

\*Corresponding Author: Furqan A Nizami, Department of Neurosurgery, Sher-i-Kashmir Institute of Medical Sciences, Soura, Srinagar (J&K) India.

Received: July 28, 2015; Published: August 04, 2015

### Abstract

**Background:** suppuration within chronic subdural hematoma (CSDH) resulting in subdural empyema (SDE) has been reported in literature in the form of few case reports. We report a case of unilateral suppuration from *E coli* in a patient with bilateral chronic subdural hematoma following brief diarrhea.

**Case presentation:** A 75 year non diabetic immune-competent male presented to emergency department in an unconscious state (GCS 7). He had prior history of intermittent fever for two days and brief diarrhea 10 days back. CT scan head showed bilateral CSDH.

**Surgical Intervention:** burr hole drainage on right side revealed purulent infected CSDH whereas left side showed typical hemorrhagic fluid. Cultures from purulent fluid grew *E.coli*.

**Conclusion:** Chronic SDH or subdural empyema, unilateral or bilateral is not an uncommon entity, but chronic SDH with contralateral subdural empyema infected with *E. coli* with history of diarrhoea, has not been reported in neurosurgical literature till date.

**Keywords:** Chronic SDH; Contralateral Empyema; *E.coli* Gastroenteritis; Death

### Introduction

Subdural Empyema (SDE) which refers to suppuration along the intracranial subdural spaces is a common condition accounting for 13-23% of all intracranial infections. Although the advent of new generation antibiotics and early diagnosis with imaging has helped greatly in decreasing the rate of suppuration, it still bears high morbidity and mortality 7-30%. SDE developing through suppuration of chronic subdural hematoma (CSDH) is a rare condition with few case reports in literature [1-4].

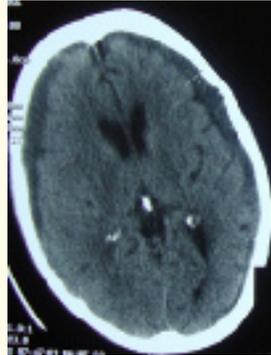
We present a case of bilateral CSDH which was infected with *Escherichia coli* on one side sparing the contralateral side and resulting in a life-threatening central nervous system infection which is rather a more rare entity, nowhere mentioned in literature so far. Unilateral suppuration in a patient with bilateral CSDH as a result of hematogenous spread from gut following brief diarrhea has not been reported in literature till date.

### Case Report

We had a 75 year old male non diabetic immune-competent who presented to Department of Emergency Medicine with history of intermittent fever for 2 days, multiple episodes of vomiting followed by sudden loss of consciousness of 1 day. He had 5-6 episodes of loose stools over a period of 2 days around 10 days earlier which recovered without any specific treatment. He was known hypertensive on erratic antihypertensive treatment. He had no history of trauma or any evidence of sinusitis, bronchiectasis, infective endocarditis, ear discharge, chest pain or cough suggesting any other source of infection. On arrival he had GCS 7 (M5V1E1), moving all four limbs equally. Patient was resuscitated, intubated and stabilized. He had bilateral coarse breath sounds, for which X ray chest was done.

**Citation:** Sarbjit S Chhiber., et al. "Chronic Subdural Hematoma with Contralateral Subdural Empyema". *EC Neurology* 2.1 (2015): 29-32.

A diagnosis of chronic subdural hematoma (CSDH) as shown in (Fig 1) was made. Patient had bilaterally normal reacting pupils. Blood biochemistry, cultures and a complete haemogram was sent which revealed leucocytosis with neutrophilia, other all investigations were under normal limits. He was operated under local anaesthesia with frontal and parietal burr holes. Dura was opened and subdural fluid was drained, which was purulent fluid, subjected to culture sensitivity. Thorough saline irrigation was done and the wound was closed over a subdural drain. Under aseptic conditions, the left side was also drained through frontal and parietal burr holes, only old hemorrhagic fluid without any evidence of infection was found. These wounds were closed over a subdural drain after thorough saline irrigation.



**Figure 1:** Plain CT head showing hyper dense bilateral subdural collection in frontoparietal area with mass effect, more on right side.

Patient was empirically put on broad spectrum antibiotics till culture sensitivities were available. Pus culture showed the growth of *Escherichia coli* sensitive to Meropenem, Cefoperazone plus Sulbactam Amikacin and Gatifloxacin. Despite antibiotic therapy, patient's condition deteriorated rapidly on third post operative day and a check CT scan with contrast (Fig 2) was done. Patient was put on oxygen therapy. Patient had generalized tonic-clonic seizure and died 4 days after surgery.



**Figure 2:** Post contrast CT brain done after evacuation of bilateral chronic subdural collection, which turns out to be empyema on right side. Subdural collection on both sides has been drained out with no mass effect.

### Discussion

SDE is a condition with high morbidity and mortality rates (7-30%). Stephanov, *et al.* [5] described subdural empyema "as the most imperative of neurological emergencies" which if not treated immediately there is high risk of status epilepticus, spreading cortical venous and cortico venous sinus thrombosis, fulminant cerebritis, brain swelling cerebral conning and ultimately leads to death.

**Citation:** Sarbjit S Chhiber, *et al.* "Chronic Subdural Hematoma with Contralateral Subdural Empyema". *EC Neurology* 2.1 (2015): 29-32.

Most common etiological factors are untreated meningitis in children and rhino-otologic infections in adults. In all age groups, SDE may develop after open or penetrating head injury, intracranial surgery, chronic systemic infections mostly from intra-abdominal abscess, open wounds, lung infections, genitourinary tract infections. Immunodeficiency; primary or secondary to diabetes mellitus, HIV, malignancies or associated chemotherapy and immuno suppressant drugs predisposes the patients to chronic subdural hematoma [4,6-8]. Our patient did not have any predisposing factors for SDE except for self limiting diarrhea.

Young males are commonly infected as was seen in a study by Tiwari, *et al.*<sup>14</sup> 42.2% young with 75% males. The most common presentations are fever (77-96%), headache (32-78%), vomiting (8-23%), frontal skin and periorbital edema (31%), unconsciousness (50-62%), meningeal irritation (60-74%), focal neurological deficits (35-48%) and the seizures (29-39%) [9,10]. In our patient, the clinical picture included intermittent fever, vomiting, unconsciousness but there was no seizure before surgery.

The most common causative microorganism in SDE is *Streptococcus milleri* which is a normal oral commensal (17%) followed by *B. hemolytic streptococcus*, *Staphylococcus aureus* and its other spp., *Haemophilus influenzae*, *Proteus mirabilis*. Very rarely seen pathogens are *Escherichia coli*, *Pseudomonas aeruginosa*, *Enterococcus faecalis* and *Klebsiella pneumoniae* which often appeared as single case or small series in the medical literature. However, in a significant number of patients (20-30%), causative agent for SDE may not be isolated at all [3-4,6,7,10].

From a small number of SDE cases diagnosed to have *E. coli* species as the causative agent, the fact had emerged that the agent often reached the subdural space via hematogenous dissemination from other foci such as urocystitis. The passage and colonization was facilitated by immune-compromised condition of diabetes mellitus, cancer therapy etc. [4,11,12].

High morbidity and mortality in case of SDE is explained by cerebral vascular occlusions such as dural venous sinus thrombosis and/or arterial vasculitis. The most causative microorganisms include *Streptococcus pneumoniae* and other streptococci, *Staphylococcus aureus*, and *Klebsiella* species [13]. These thromboses could occur as a result of spread from primary focus of infection or from hematological dissemination such as septic thrombo-emboli. Also, spasm or inflammation of the arterial wall could be appeared by arterial invasion of infection [14,15].

Our patient was non diabetic immune-competent with no evidence of genitourinary infection as was confirmed by urine cultures. The possible mechanism in our patient was seeding of the chronic subdural collection during the episodes of intermittent bacteremia as a result of gastrointestinal infection causing diarrhea. Another possibility is that brief non specific diarrhea would have compromised the integrity of gut mucosal barrier leading to episodes of *E.coli* bacteremia and secondary infection of CSDH. Medline and google scholar search did not show any case of CSDH getting infected from hematogenous spread from gut infection causing diarrhea, so we report first such case [16-17].

Studies have shown that the early diagnosis, urgent surgery with long-term intravenous administration of appropriate antimicrobial drugs have decreased morbidity and mortality of SDE from 30% down to 7% [2,6,12]. Craniotomy that enables total removal of infected subdural membranes is definitely the procedure of choice. It is superior to burr-hole drainage although burr-hole drainage is superior to blind antimicrobial treatment. Craniotomy reduces the re-operation risk because of large operative field however the bone flap can be lost because of bone infections.

### Conclusion

As microorganisms like *E.coli* may directly infect the subdural space with hematogenous contamination. In a patient with bilateral subdural collection and rapidly deteriorating neurological status with fever and no/or minimal midline shift, early diagnosis and urgent surgery with long-term intravenous administration of appropriate antimicrobial drugs can decrease the morbidity and mortality of SDE. Suppuration in one of both the sides should be suspected seeding secondary to brief diarrhea is reported for first time.

### Bibliography

1. Aoki N., *et al.* "Infected subdural effusion associated with resolving subdural hematoma case report". *Neurologia medico-chirurgica* (Tokyo) 37 (1997): 637-639.
2. Bok AP and Peter JC. "Subdural empyema: burr holes or craniotomy? A retrospective computerized tomography-era analysis of treatment in 90 cases". *Journal of Neurosurgery* 78.4 (1993): 574-578.
3. Chan DB., *et al.* "Subdural empyema post-chemo radiotherapy for nasopharyngeal carcinoma". *Singapore Medical Journal* 47 (2006): 1089-1091.
4. Choi CH., *et al.* "A case of infected subdural hematoma". *Journal of Korean Neurosurgical Society* 34 (2003): 271-273.
5. Stephanov s., *et al.* "Combined convexity and parafalcine subdural empyema". *Surgical Neurology* 11 (1979): 147-151.
6. Nathoo N., *et al.* "Intracranial subdural empyemas in the era of computed tomography: a review of 699 cases". *Neurosurgery* 44.3 (1999): 529-535.
7. Tewari MK., *et al.* "Spectrum of intracranial subdural empyemas in a series of 45 patients: current surgical options and outcome". *Neurology India* 52.3 (2004): 346-349.
8. Weingarten K., *et al.* "Subdural and epidural empyemas: MR imaging". *American Journal of Roentgenology* 152 (1989): 615-621.
9. Mauser HW and Tulleken CA. "Subdural empyema. A review of 48 patients". *Clinical Neurology and Neurosurgery* 86 (1984): 255-263.
10. Yamasaki F., *et al.* "A case of infected subdural hematoma complicating chronic subdural hematoma in a healthy adult man". *No To Shinkei* 49 (1997): 81-84.
11. Honda M., *et al.* "A case of infected subdural hematoma following chronic subdural hematoma irrigation". *No To Shinkei* 54.8 (2002): 703-706.
12. Kojima A., *et al.* "Supra-and infratentorial subdural empyema secondary to septicemia in a patient with liver abscess--case report". *Neurologia medico-chirurgica* 44.2 (2004): 90-93.
13. Southwick FS., *et al.* "Septic thrombosis of the dural venous sinuses". *Medicine (Baltimore)* 65.2 (1986): 82-106.
14. Kamouchi M., *et al.* "Venous infarction secondary to septic cavernous sinus thrombosis". *Internal Medicine* 45.1 (2006): 25-27.
15. Osborn MK and Steinberg JP. "Subdural empyema and other suppurative complications of paranasal sinusitis". *The Lancet Infectious Diseases* 7.1 (2007): 62-67.
16. Hirano A., *et al.* "Subdural abscess following chronic subdural hematoma". *No shinkei geka. Neurological surgery* 23.7 (1995): 643-646.
17. Kawamoto S., *et al.* "Subdural empyema caused by hematogenous dissemination from an abscess in thigh to a preexisting chronic subdural hematoma--case report". *Neurologia medico-chirurgica* (Tokyo) 38 (1998): 743-745.

**Volume 2 Issue 1 August 2015**

© All rights are reserved by Sarbjit S Chhiber., *et al.*