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Intracranial Subdural Empyema and Brain Abscess Following a Minor-Trauma Induced Chronic Subdural Hematoma

KM Tarikul Islam, Muhtamim Chowdhury, Sujan Sharif, Rathin Halder, Narendra Shalike, Nafaur Rahman and Bipin chaurasia*

Department of Neurosurgery, Bangabandhu Sheikh Mujib Medical University, Shahbagh, Dhaka, Bangladesh.

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ABSTRACT

Intracranial subdural empyema along with brain abscess are serious debilitating conditions with increased risk in patients undergone cranial surgery and to those with immunosuppression, extremes of age, malnourishment. Here we present a case with the subtlest neurological deficits and its progression with time. We shall review our goals and attitude in treating this patient.

INTRODUCTION

Intracranial subdural empyema (ISDE) is a condition characterized by localized collection of pus in between the arachnoid and dura mater. It almost never crosses the meningeal boundaries such as the falx or the tentorium. This condition is rare due to the modernization of armaments in microbial warfare. Better fitted techniques and hospital attitude to disposables and sterility has brought done the incidence of ISDE further down. Non-traumatic chronic subdural hematomas to develop ISDE have been reported in only 27 documented cases around the world. A pre-existing subdural hematoma transforming into an ISDE is attributed to hematogenous spread of infective potentials. It is extremely difficult to narrow out the possible spectrum of organisms more probable to cause this particular condition [1,2].

In this report we present an adult case that developed ISDE along with a solitary brain abscess following chronic subdural hematoma.

CASE REPORT

T This lady of 70 years was admitted under our care following a prolonged period of care outside our facility. She was previously admitted with a history of slipping and hitting her head 2 years back and was admitted with signs of moderate head injury. Following evaluation, she was diagnosed as a case of left sided subdural hematoma. The size of the hematoma and the progression of the patient demanded a conservative approach in this patient. Later she was discharged in good health. But 6 months into the incident she developed convulsions starting on one side of her body and lasted for 2-3 min, this followed with right sided hemiparesis which progressed slowly. The patient was admitted again with an increase in the size of the subdural hematoma **(Figure 1)**.

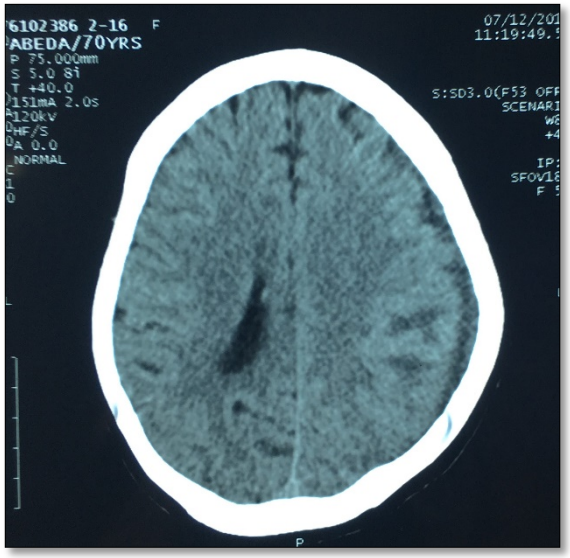

Figure 1. Left sided chronic subdural hematoma.

Corresponding author: Bipin Chaurasia, Chief Resident, Department of Neurosurgery, Bangabandhu Sheikh Mujib Medical University, Shahbagh, Dhaka, Bangladesh, Tel: 8801732531039; E-mail: trozexa@gmail.com

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A unilateral burr hole over the parietal prominence was made and the hematoma drained. The operation note stated of motor-oil fluid to be evacuated and the inner membrane was left intact. Immediate post-operative recovery was well and the patient was discharged 15 days later. The patient had been away from regular follow-ups. But nine months into her recovery she started having intermittent low-grade fever with chills and rigors. She lost considerable amount of weight and was apathetic. Her care givers notice a slow development of swelling over the previous scar for the burr hole. The swelling slowly gave away and discharged frank pus. She was taken back and admitted and started on empirical antibiotics. On radiology she was found to have a subdural collection with enhanced walls juxta to the parietal bone. Burr hole drainage using the same incision mark was done and cultures sent, which were negative for growth.

Patient on this round was on total 3 weeks of antibiotics. Three weeks following discharge she again developed the same condition with swelling and discharge from the wound with an even worse hemiparesis. Repeat CT scan was done and was show to have reformation of pus **(Figure 2)**. On evaluation for markers of inflammation and microbiology no signs of sepsis were proved. To note especially serial microbiological cultures were all negative. Craniectomy of the osteomyelitic parietal bone was done and frank pus from both the epidural, subdural compartments were drained and sent for cultures.

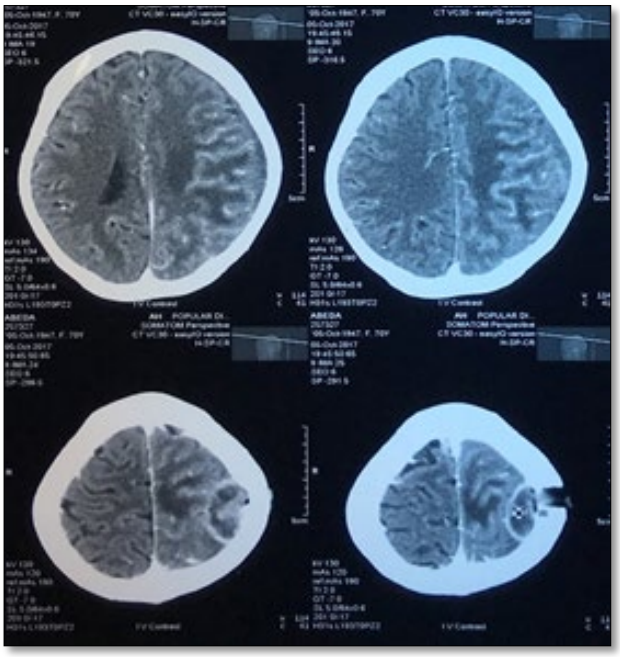

Figure 2. Large biconvex lesion with enhancing walls on contrast just below the previous burr hole drainage for left CSDH.

The intra-axial abscess was drained using a brain cannula and thoroughly washed. Locally necrotic parts of the brain were removed and were through washed using normal saline and Hydrogen Peroxide. A 12F Penrose drain was kept epidurally and was closed ensuring hemostasis. Patient was followed up and continued on broad spectrum empirical antibiotic coverage, including anaerobes; as the cultures failed to yield any growth. The patient objectively improved as hemiparesis was reduced and fever subsided, but CBC and CRP were inconclusive. Three weeks into in house intravenous antimicrobial therapy the patient again started to develop fever, hemiparesis, and the swelling over the craniectomy defect. Radiological evaluation using CT scan showed the formation of a large extra-axial subdural hypodense crescentic collection of pus and intra-axial solitary abscess with thickened walls within the left parietal lobe **(Figure 3)**.

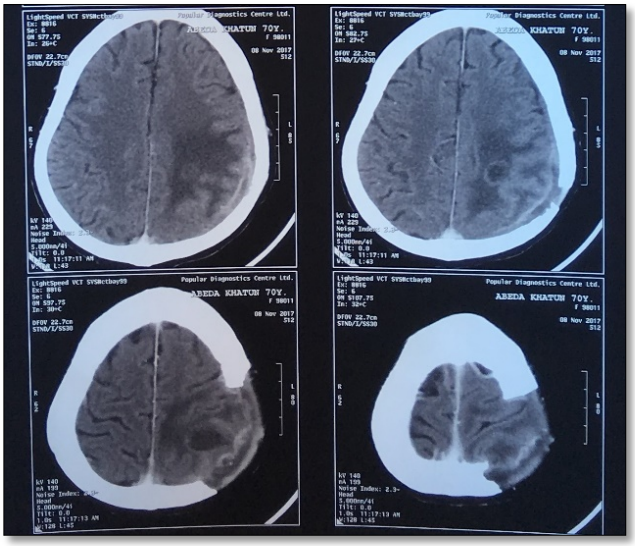

Figure 3. Reformation of subdural empyema and intraparietal abscess following craniectomy.

Re-exploration and drainage was again performed and the samples sent for culture. As usual the cultures failed to point out any responsible micro-organisms. Additional three weeks of intravenous antimicrobials was given and patient was put on a high energy diet, along with supplements. She received three whole blood transfusions in her two months of care in this hospital. Patient subjectively and objectively improved and was put on oral antibiotics following 6 weeks of intensive intravenous antimicrobial therapy. After satisfactory improvements in the general condition of the patient she was discharged with advice along a further 6 months course of oral antimicrobials and scheduled follow-up visits every 15 days **(Figure 4)**.

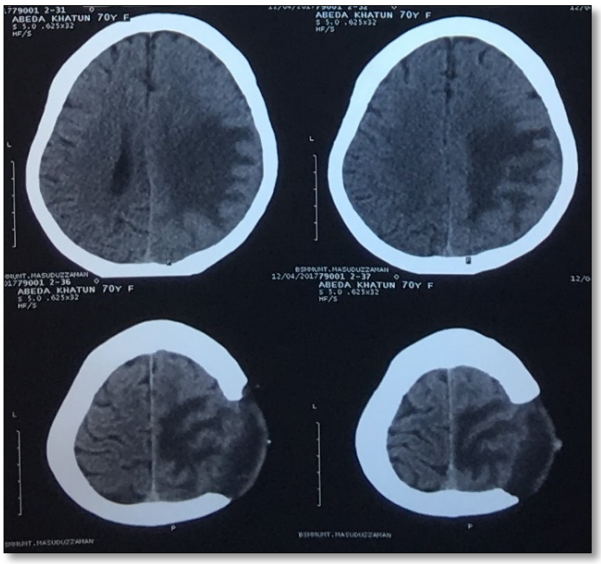

Figure 4. Resolution of ISDE and intraparietal abscess.

DISCUSSION

Due to the relatively low incidence of subdural hematomas being infected there was only 27 reported cases on literature review [2]. The mortality rate from ISDE has dropped to levels below 10% from 40% due to advances in the fields of medicine [3]. The only challenge in this condition is that the clinicians is faced with the odd of a very invasive and stubborn infection without the classical clinical signs that should have been related to it [1,4]. The same pattern was seen in our patient, she had no signs of meningism or overt septicemia or sepsis. In one study it is of opinion that patients with ISDE have subtle symptoms and signs only 15% presents with headache and 35% with fever [3]. These refractory cases' management has to be tailored to the clinical settings in that particular situation. Our patient particularly had no yield on any of the cultures given out. This prompted us to use empirical antimicrobials with meningitic concentrations for the utmost efficacy. On the note of interventions, burr hole and craniotomy are both appropriate as surgical procedures for this particular setting [2]. But in our case we have had poor results with both burr hole and craniectomy, both being required multiple times.

CONCLUSION

In our opinion, these cases need more attention due to the misleading fact of subtle warning signs to an overt and deadly disease. Lesions reappearing after an initial burr hole drainage should be prompted to be converted to a formal craniectomy and planning for cranioplasty at a later setting.

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