Intracranial subdural empyema case series

Retrospective review of a prospectively collected electronic departmental database included all patients who were admitted to our unit with a diagnosis of subdural empyema over an 11-year period (2008-2018). Basic demographic data were collected. Further data pertaining to mode of presentation, surgical approach, causative organism, post-operative antibiotic regime, anti-seizure medications, length of hospital stay, further surgery, and neurological outcomes were extracted.

Results: Thirty-six children underwent 44 operations for subdural empyema at our institution during the study period. Median age was 11.0 (range 0.2-15.8); 47.2% (17/36) were female. Over time, there was decreasing use of burr holes and increasing use of craniectomy as the index surgery. Using a combination of extended culture and polymerase chain reaction, a microbiological diagnosis was achieved in all 36 cases; the commonest causative microorganism was of the Streptococcus anginosus group of bacteria. Seven patients underwent repeat surgery, and 4 patients underwent a concurrent ENT procedure. No risk factors were significant in predicting the likelihood of re-operation (location of subdural empyema, age, index surgery type, inflammatory markers, concurrent ENT procedure, and microorganism) although it was notable that none of the patients undergoing a concurrent ENT procedure underwent repeat surgery ($p = 0.29$). Median length of stay was 12 days (range 3-74), and there were no inpatient or procedure-related mortalities. Clinical outcomes were good with 94.4% (34/36) categorized as modified Rankin Scale 0-3 at discharge and there were 2 cranioplasty-related complications.

Conclusions: We observed an evolution of practice from limited surgical approaches towards more extensive index surgery over the study period. Given that a microorganism was isolated in all cases using a comprehensive approach, initiation of antibiotic therapy should not be delayed on presentation. Concurrent ENT surgery may be an important factor in providing aggressive source control thereby reducing the need for repeat surgery [1)]

1990

Forty one cases of subdural empyema treated between 1977 and 1988 at the Postgraduate Institute of Medical Education and Research. Chandigarh, have been analysed. The patients ranged from 9 days to 80 years of age. There were 22 children, including 11 infants. Fever, altered sensorium and seizures were the most common symptoms present for 1 day to 6 months. Otogenic infection was the commonest aetiological factor followed by postoperative and posttraumatic causes. Thirty seven patients had supratentorial empyemas, including 4 with parafalcine collections, three had infratentorial empyemas, and in one there was extension of the empyema from the supratentorial to the infratentorial compartment. Therapeutic modalities used included percutaneous needle aspirations in infants and burr hole evacuation and craniotomies in adults. A wide spectrum of organisms was detected. Mortality in this series was 24%, which was mainly attributable to the deteriorated neurological status prior to treatment. A detailed review of the literature has been given, highlighting various controversies in the management of SDE. Important prognostic factors and a treatment plan are suggested [2)].

1975

Seventeen patients with this infection, treated between 1967 and 1974, are analyzed and compared

to published series with particular regard to diagnosis using newer procedures and treatment, considering the primary focus of infection. The infection is usually located in the supratentorial spaces, is often bilateral, and results most often from para-nasal sinusitis (single most common cause), otitis, neurosurgical operative infections, and meningitis in infants. Patients suffering from subdural empyema generally present with rapid onset of depressed sensorium, seizures, focal neurological deficits, and signs of increased intracranial pressure, following a period of days to weeks characterized by headache and fever. All 17 of our patients demonstrated localizing neurological signs and 16 manifested either fever or leukocytosis. Diagnostic studies, except for cerebral arteriography, do not reliably corroborate or exclude the diagnosis. Cerebral arteriography established the diagnosis and defined the location and extent of the empyema in all of our cases. The EEG and brain scan produced frequent false-negative and/or non-localizing results in 10 and 8 patients, respectively. The cerebrospinal fluid was abnormal from all 15 patients examined by lumbar puncture, but the findings were similar to those in other infectious and non-infectious central nervous system diseases. Signs of transtentorial herniation developed within eight hours following lumbar puncture in three of seven patients who had exhibited signs of increased intracranial pressure before the procedure was performed. Bacterial cultures were positive in 13 of our cases. A review of our data and that of other studies indicates that the organisms associated with subdural empyema are consistent with those expected from infections of the primary site; e.g. sinusitis, otitis, meningitis, site of prior neurosurgery. A therapeutic approach is suggested which emphasizes specific antibiotic regimens appropriate to the primary site of infection and prompt neurosurgical intervention with evacuation of the subdural spaces bilaterally. In general, combination antimicrobial therapy employing high parenteral doses of penicillin G, a semi-synthetic penicillinase-resistant penicillin and chloramphenicol is recommended [3].

1)

Rasul FT, Chari A, Iqbal MO, Silva G, Hatcher J, Hartley J, Tahir MZ. The Case for Early Antibiotic Commencement and Source Control in Paediatric Subdural Empyema: A Single-Centre Retrospective Case Series. Pediatr Neurosurg. 2022;57(1):28-34. doi: 10.1159/000521038. Epub 2021 Dec 27. PMID: 34959234.

2)

Pathak A, Sharma BS, Mathuriya SN, Khosla VK, Khandelwal N, Kak VK. Controversies in the management of subdural empyema. A study of 41 cases with review of literature. Acta Neurochir (Wien). 1990;102(1-2):25-32. Review. PubMed PMID: 1968310.

3)

Kaufman DM, Miller MH, Steigbigel NH. Subdural empyema: analysis of 17 recent cases and review of the literature. Medicine (Baltimore). 1975 Nov;54(6):485-98. PubMed PMID: 1186492.