

Chemical Meningitis in a Child after Frontotemporal Craniotomy Treated by Lumboperitoneal Shunt - A Case Report

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Abstract

Chemical meningitis is a syndrome characterized by fever and signs of meningism with cerebrospinal fluid (CSF) pleocytosis, increased protein and blood & CSF culture negative. It is a common complication after posterior fossa surgery than the fronto, temporo and parietal craniotomy procedures. It is often self limiting course requiring repeated CSF examination to exclude infection. We report a case of recurrent thalamic pilocytic astrocytoma underwent fronto temporal craniotomy, post operatively developed pseudo meningocele with features of chemical meningitis. As all conservative measures failed, patient underwent Lumboperitoneal shunt, found to be resolution of symptoms.

Keywords: Chemical meningitis, Pseudomeningocele; Lumboperitoneal shunt.

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Introduction

Chemical meningitis is a recognized complication after neurosurgery, more common in posterior fossa surgery than the fronto, temporo and parietal craniotomy procedures. It is often self limiting course but occasionally requiring repeated CSF examination to exclude infection. By definition Chemical meningitis is a syndrome characterized by pyrexia and signs of meningism with CSF pleocytosis, elevated CSF protein and blood & CSF culture negative.

Case Report

A 10 year old boy known of Right thalamic

pilocytic astrocytoma WHO grade I, underwent Right temporal craniotomy and excision of tumor in June 2018, presented with weakness of left upper limb and lowerlimb. MRI brain was done showed tumor recurrence. He underwent Right fronto temporal craniotomy and excision of tumor in January 2020. Post operative period was uneventful and was discharged on 5th Post operative day (POD). On 12th POD patient presented with swelling in the operated site with fever and headache. CT brain was done showed pseudomeningocele with no hydrocephalus. About 30 ml CSF was aspirated under sterile precautions and tight crepe bandage was applied over the scalp and CSF sent for culture & sensitivity, sugar and protein analysis. Antipyretics was given for the fever. On 13th POD therapeutic lumbar puncture was done under aseptic precautions and about 40 ml of CSF let out and sent for analysis. Both CSF analysis showed increased CSF protein, reduced sugar, lymphocytosis and culture negative. On 21th POD as fever and headache was not subsided, patient was admitted and evaluated. Infectious disease consultant opinion obtained and started on Intravenous higher antibiotics. Lumbar puncture was done and again CSF sent for analysis, showed progressive elevated protein, reduced sugar, lymphocytosis, normal lactate, culture was negative

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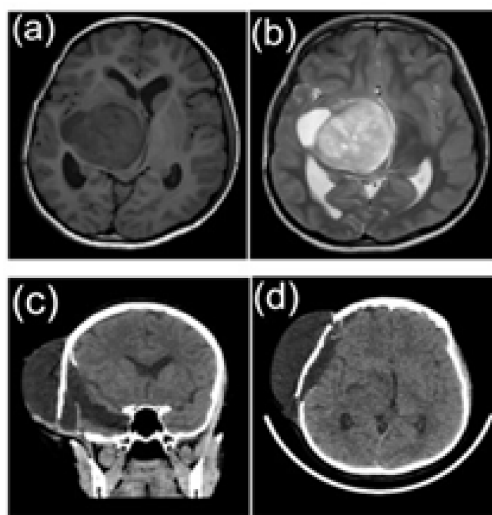
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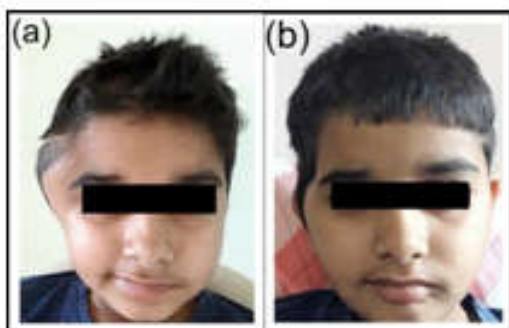
and Serum procalcitonin was normal. As all investigation ruled out infection and diagnosed as chemical meningitis, planned for Lumboperitoneal shunt and was done.

Table 1: shows CSF analysis.

Date	12/02/2020	13/02/2020	21/02/2020
Colour	Pale yellow	Pale yellow	Colorless turbid
RBC	84	120	400
WBC	373	368	330
Neutrophils	26	28	5
Lymphocytes	74	72	95
Protein (mg/dl)	120	142	158
Sugar (mg/dl)	37	38	22
Chloride (mEq/L)	112	110	118
Lactate (mmol/L)	3.5	3.4	3.4
Gram stain	No organism	No organism	No organism
Growth	No growth	No growth	No growth



Picture 1: (a) (b) MRI brain T1 and T2WI shows Right thalamic glioma. (c) (d) CT brain axial and coronal view shows pseudomeningocele



Picture 2: (a) Pseudomeningocele on right side. (b) Complete regression of pseudomeningocele

Discussion

The relation between neurosurgery and chemical meningitis has been known for a long time. As early as 1928, Cushing and Bailey described a culture negative, presumed chemical meningitis.¹ Finlayson and Penfield found this process in 1.6% of 1200 craniotomies and in 7% of sub occipital craniotomies for tumor.² Carmel and colleagues found chemical meningitis in 35 of 50 children undergoing posterior fossa surgery. Most authors believe that bacterial and chemical meningitis has similar clinical and spinal fluid findings. Although chemical meningitis has been noted after supratentorial surgery, it is more frequent after posterior fossa surgery and more commonly occur in children.³ Caramel et al described aseptic meningitis in 70% of 50 children undergoing posterior fossa surgery.⁴ The meningitic reaction did not correlate with the underlying lesion, closure of the dura, initial postoperative CSF red cell count, or postoperative drainage of CSF. Symptoms appeared as late as the 2nd or 3rd week postoperatively and could last 3-4 months. Clinical characteristics described included headaches, fever, and meningism, and less commonly impairment of consciousness and neurological deficit. Pleocytosis in the CSF, with a significant mononuclear component (or less commonly polymorphs but later lymphocytes), often predominated. The underlying etiology remains uncertain. Cushing and Bailey suggested that the pyrexia might be due to blood in the CSF but Carmel et al., demonstrated that red blood cells need not be present for pyrexia to continue. Finlayson and Penfield suggested that a cyst-like cavity may form postoperatively and fill with clot and products of tissue destruction which would discharge periodically, and Matson proposed that breakdown products from the tumour bed might be responsible.⁵ Attempts to define CSF substances associated with aseptic meningitis have included blood/brain/tumour and muscle markers (hemoglobin, bilirubin, myoglobin, and creatinine kinase) but no clear pattern has emerged. Operative technique, postoperative radiotherapy, or antibiotics did not influence the course of aseptic meningitis.⁶ Treatment of aseptic meningitis by decompression of a related pseudomeningocele has been previously reported by Jacobset al.⁷ They describe a case of aseptic meningitis in an 8 year old boy after removal of a cystic astrocytoma. One month after initial surgery he required the placement of a ventriculoauricular shunt which became necessary to eliminate the “unsightly bulging of the decompression site.” The

symptoms resolved after the operation. In our case Lumboperitoneal shunt helped in resolution of the symptoms and pseudomeningocele regression.

Conclusion

Chemical meningitis is a recognized complication after neurosurgery, more common in posterior fossa surgery than the fronto, temporo and parietal craniotomy procedures. In our case, Lumboperitoneal shunt leads to resolution of the symptoms and regression of pseudomeningocele.

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