PSEUDOMONAS AERUGINOSA MENINGITIS: A CASE REPORT

Abstract:
AIM : To present a case of Pseudomonas meningitis with an atypical presentation.
CASE PRESENTATION: A 48 year old male with history of RTA related brain injury and shunt placement , presented with complaints ofdiarrhoea. On further investigations he was found to have Gram negative meningitis on CSF studies. This case highlights patient's course in hospital.
CONCLUSION : Patient's with prior history of neurosurgical intervention are at higher risk of meningitis due to Gram negative organisms like Pseudomonas aeruginosa and they may present with atypical symptoms.

KEY WORDS : Chronic diarrhea ,Meningitis , Gram negative, Pseudomonas aeruginosa,Ventriculo-peritoneal shunt, Craniectomy, Candidemia ,

Introduction :
Chronic meningitis is meningitis lasting more than four weeks, which can be infectious or non-infectious***.****Pseudomonas aeruginosa* , a Gram-negative bacillus is a rare cause of meningitis. Recent case series have brought to light a pattern of patients developing meningitis post neurosurgical procedures.[1] The possibility of a ventriculoperitoneal (VP) shunt infection is most likely to be in the earlier days after shunt insertion. Between 56% and 87% of infections occur within one month of shunt insertion.[2]The fatality rate of Gram negative bacilli meningitis is also high accounting to more than 50%.[3]The following is a case report discussingcourse and management of patient with a rather intriguing presentation

Case Presentation :
A 48 year old male patient, was a known case of Traumatic Brain injury and Type 2 Diabetes mellitus, who presented with loose stools. Previous surgical procedures included Craniectomy done 3 months before admission followed by Ventriculoperitoneal shunt placement and cranioplasty 1 month after previous surgery. He had a prolonged hospital stay of 3 months requiring multiple antibiotics, after which he was discharged home with stable vitals and Glasgow Coma Scale (GCS) of E4VTM1. His presenting complaint was 10-12 episodes of loose stools per day since one month. On initial examination,Pulse rate was 90/minute , Blood pressure of 100/60mmHg , Respiratory rate of 25/minuteand GCS was E4VTM1. On systemic examination, generalized rigidity was present and abdomen was soft.Blood investigations showed anemia with neutrophilic leukocytosis,elevated inflammatory markers and dyselectrolytemia. (TABLE 1). He was started on Oral

Vancomycin with possibility of Pseudomembranous colitis and other supportive measures, however Clostridium difficile was negative. There was no improvement in his symptoms.

TABLE 1: INITIAL BLOOD TESTS			
ESR	67	UREA	14.2
CRP	55	CREATININE	0.8
HEMOGLOBIN	9	PTINR	0.98
WBC COUNT	12000	APTT	29
PLATELET	673	HBA1C	6.7
POTASSIUM	2.5	ALBUMIN / GLOBULIN	3
MAGNESIUM	1.1	AST / ALT	22 /9.6
PHOSPHORUS	1.8	TOTAL BILRUBIN	1.2
CALCIUM	7.6	DIRECT BILRUBIN	0.7
SODIUM	133	ALP	140

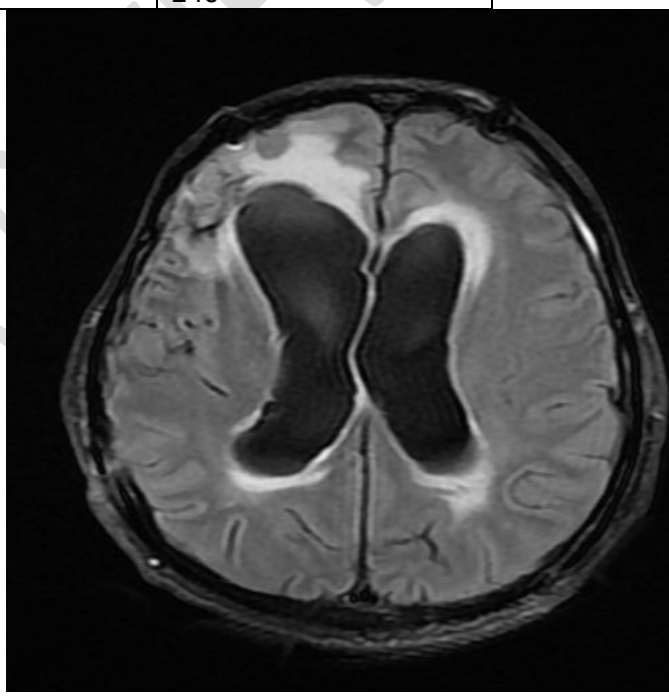

FIGURE 1 : MRI BRAIN WITH CONTRAST – Hydrocephalus involving bilateral lateral ventricles.

In view of background of Traumatic brain injury associated with decreased sensorium,Magnetic Resonance Imaging (MRI) brain with contrast was done.(FIGURE 1) The study showed hydrocephalus involving bilateral lateral ventricles and third ventricle with relative sparing of fourth ventricle possibly aqueductalstenosis. Post contrast meningeal enhancement with a thin rim of collection was also noted along left frontoparietal convexity.Patient had two episodes of generalized tonic clonicseizures, each lasting for 2 minutes.Cerebro-spinal fluid (CSF)studies revealed elevated total cell count (4,320)with 85% segmented cells andCSF culture grew Pseudomonas aeruginosa (TABLE 2).He was started

on intravenous (IV) Antibiotics Cefepime 2g Q8H and Amikacin 5mg/kg Q8H, according to the CSF culture and sensitivity reports. Blood cultures showed no growth. Few days later, a discharging sinus was noted over the left clavicle. USG of the region showed hypo echoic collection noted around and along Ventriculo-peritoneal(VP) shuntand fistula between the VP shunt and the skin. Pus swab grew Pseudomonas aeruginosa. Neurosurgery was consulted and a joint decision to do VP shunt removal was taken. During procedure,pus was present in the ventricular and abdominal end of the tube. Catheter tip from ventricle and abdominal end were growing Pseudomonas aeruginosa. During hospital stay, he developed Lower Respiratory Tract Infection with Mini Bal culture growing Pseudomonas aeruginosa.As total cells in CSF were downtrending, patient was taken up for Endoscopic third ventriculostomy. However,patient's sensorium (GCS-E4VTM1) remained status quo , but loose stools subsided.There was no further rise in the inflammatory markers andantibiotics were de-escalated.As part of the evaluation of recurrent fever spikes , CT Chest was done and showed thrombus in the Right Internal Jugular vein. His blood culture grew Candida tropicalis (Candidemia) . In spite of the multi-disciplinary approach and aggressive management, he eventually succumbed to his illness.

TABLE 2: CSF REPORTS

CSF Studies	Total count (Differential Count)	Protein	Sugar
1st CSF	4320 (85% SEGMENTED CELLS , 15% MONONUCLEAR CELLS	237	26
2nd CSF	60 (2% SEGMENTED , 10% MONONUCLEAR)	60	123

Discussion:

Post-neurosurgical infection is a serious complication with a high degree of mortality. Gram-negative bacterial infections of the central nervous system CNS (commonly *Escherichia Coli*, Enterobacter species, Serratia species, and *Pseudomonas aeruginosa*) have worse clinical outcomes.[3]According to study by *Zeinalizadeh et al* , Gram negative CSF positivity was found in 54% samples , out of which Klebsiella pneumonia was the commonest and Pseudomonas aeruginosa infections was 4.4%.[4]The clinical presentation of a ventriculoperitoneal (VP) shunt infection can range from the classical signs and symptoms of meningitis to fever with abdominal pain and peritonitis, as referenced in the case report by *Charalampoudis*.[5] Previous studies have indicated that patients with GNB CSF shunt infections often appear relatively well at presentation and often the diagnosis is masked[6].Diagnosis of bacterial meningitis on Lumbar puncture studies show elevated leucocytes with increased Neutrophils and elevated proteins. A rapid diagnosis is essential to treatment.[7] Initial broad spectrum empirical intravenous antimicrobial therapy with appropriate Gram-negative coverage therapy has shown good outcomes with decreased mortality.According to the study by *Yi-jun Shi et al*, a GCS score less than 8, had a higher risk of mortality.[8]In the study by *Youcef Megri et al*, *Candida tropicalis*candidemia was most

prevalent followed by *Candida parapsilosis*. There was high mortality among these patients and a need for anti-fungal stewardship was highlighted.[9]

***Conclusion*:**

Patients with neurosurgical intervention are at higher risk of developing GNB meningitis. It is vital to keep an open mind when such patients present with atypical symptoms also. Although there is high mortality associated with Gram negative meningitis, timely diagnosis and treatment proves to be associated with positive outcomes. A multi-disciplinary approach is crucial in such patients.

***Consent*:**All authors declare that written consent was obtained from the patient for publication of this case report.

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