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Case Report

A case of a brain stem abscess with a favorable outcome

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Abstract

Background: A brain stem abscess is a rare and severe medical condition. Here, we present a rare case of a brain stem abscess in a young pregnant woman, requiring acute stereotactic intervention.

Case Description: A 36-year-old woman presented with a headache, nausea, and vomiting, and computed tomography showed a space-occupying lesion in the brain stem. She became shortly after comatose, and we decided to perform an acute stereotactic aspiration of the abscess. Soon after surgery, her neurological condition improved dramatically.

Conclusion: A brainstem abscess is a life-threatening condition with a potentially good outcome if treated adequately.

Key Words: Brain stem abscess, life-threatening, stereotactic surgery

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INTRODUCTION

A brainstem abscess is a rare and severe medical condition. In combination with a nonspecific clinical manifestation, this can make it a dangerous and life-threating disease.[4] Very little is known about its epidemiology. The ethology may resemble that of a normal brain abscess. The incidence of a brain abscess is 0.3–1.3/100.000 persons/year but can be much higher in people with predisposing factors. In 13% of the cases, the abscess is located in the brain stem or cerebellum.[3] Clinical presentation can vary from only a headache with fever, to rapidly deteriorating neurological conditions. The latter can be due to the space-occupying effect of the lesion or obstructive hydrocephalus. The management depends on the symptoms, disease course, and the underlying microorganism.

CASE HISTORY

We were acutely confronted with a 36-year-old female pregnant patient in a severe comatose condition. The patient had a history of diabetes mellitus type 2 and recurring skin abscesses for which she had received antibiotic and surgical treatments. The patient was admitted already 3 days before deterioration at the Department of Internal Medicine with nausea, vomiting, and elevated inflammatory parameters. After developing headache, diplopia, dysarthria, and a progressive right-sided hemiparesis, the neurologist was consulted and a computed tomography (CT)-scan was performed showing a mass lesion in the brainstem. After this, an acute magnetic resonance imaging (MRI) was organized to differentiate between a tumor and abscess. The radiological diagnosis was an abscess [Figure 1]. The patient deteriorated quickly to a Glasgow Coma Scale (GCS) of the E1M5V1 score with intact brain stem reflexes.

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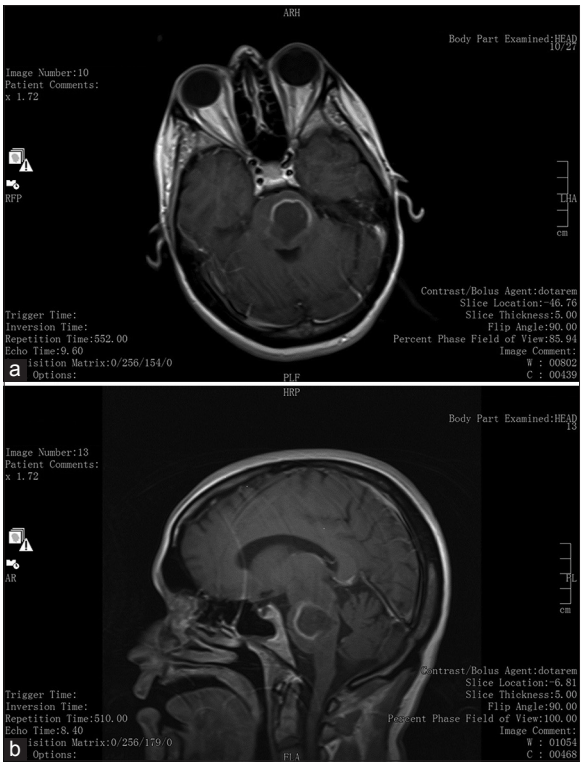

Figure 1: Preoperative magnetic resonance imaging showing contrast (gadolinium) enhancing ring-like lesion in the brain stem (pons) in axial (a) and sagittal (b) orientation

Figure 2: Magnetic resonance imaging scan (gadolinium enhanced) performed 6 months after stereotactic aspiration and antibiotic treatment. A small residual enhancement is observed. Scans are in axial (a) and sagittal (b) orientation

The patient was intubated, a stereotactic frame (Leksell stereotactic frame, Electa, Sweden) was mounted and a stereotactic CT with contrast enhancement was performed rapidly. Subsequently, a fast trajectory and target planning was done with the Framelink software (Medtronic Inc., Minneapolis, United States). Using a parasagittal burr hole on the coronal suture, a 9 cm penetration was performed to reach the lesion, and circa 4 cc of purulent collection was aspirated.

After surgery, the patient was transferred to the Intensive Care Unit, and her neurological condition improved to a GCS of 15. The hemiparesis improved slowly but evidently. Follow-up MRI scan showed progressive shrinkage of the abscess [Figure 2]. Microbiological analysis of the purulent collection showed a *Streptococcus constellatus*. She received intravenous antibiotics (ceftriaxone, metronidazole, and fluoxetine) for 12 weeks. Further investigation revealed no potential focus for the abscess. Apparently, the pregnancy was undesired, and the gynecologist was consulted. However, spontaneous abortion occurred during the hospital stay.

DISCUSSION

Here, we described our experience with a case of a female pregnant patient who deteriorated quickly due to a space-occupying brainstem abscess. An emergency stereotactic aspiration was required and resulted in a favorable outcome.

Acute stereotactic aspiration of a brainstem abscess is very uncommon. We have found 7 case reports describing 10 cases of stereotactic aspiration of a brainstem abscess.[2,7-12] A summary is shown in Table 1. The outcome of those cases is comparable to our outcome.

In an overview of 203 patients who underwent a stereotactic biopsy of a brainstem lesion, only 4% showed an infection or abscess.[14] This procedure has a high diagnostic yield and low mortality (3%) and morbidity (4%) rates.[13] *S. constellatus* is one of the *Streptococcus milleri* group and is normally found in the flora of the oral cavity and the gastrointestinal tract.[1] It is frequently isolated from intra-abdominally and soft-tissue abscesses[6] and has been established as a cause of brain abscesses.[5]

In this case report and literature review, we show that acute stereotactic aspiration and subsequent adequate antibiotic treatment leads to a favorable outcome in this potentially lethal condition.

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Conflicts of interest

There are no conflicts of interest.

Table 1: An overview of the current literature regarding stereotactic aspiration of brainstem abscess

References	Year	Sex/age (year)	Presenting symptoms	Duration of symptoms	Setting	Location	Depth	Size	Aspirated volume	Organism	Treatment	Outcome
Nauta *et al*.												
Case 1	1987	Female/7	Left 3rd, right 7th and 12th cranial nerve palsy, right hemiparesis	6 days	Subacute	Pons and mesodiencephalic junction	n.m.*	n.m.	2 cc each abscess (4 cc total)	*Haemophilus paraphrophilus*	Cefalothin (directly injectied), penicillin and chloramphenicol i.v. for 42 days	Mild right 7th cranial nerve palsy
Case 2		Male/32	Left 5th and 7th cranial nerve palsy, left hemiparesis and decreased sensation	3 weeks	Subacute and acute	Pons	n.m.	n.m.	2 cc and 1.5 cc (3.5 cc total)	CNS	Cefalothin (twice directly injectied), nafcillin and chloramphenicol i.v. for 2 months	Left hemiparesis and ptosis
Case 3		Female/23	Somnolence, right 7th cranial nerve palsy, right hemiparesis	5 days	Subacute	Pons	n.m.	n.m.	2 cc and 1.5 cc (3.5 cc total)	*Bacteroides fragilis*	Cefazolin (twice directly injected) and penicillin, chloramphenicol, metronidazole i.v. for 6 weeks	Mild right arm paresis
Rossitch *et.al*.	1988	Female/54	Headache, diplopia, left hemiparesis	5 days	Acute	Pons/ mesencephalon	n.m.	2 cm	12 cc	CNS multiple anaerobic bacteria	Additional aspiration of 5 cc pus after neurological detoriation cefatoxime i.v. 6 weeks	Ambulatory and independent
Fujino *et al*.	1990	Male/25	Right 3rd, bilateral 6th and left 7th cranial nerve palsy, left hemihypaesthesia	1-day	Acute	Right tegmentum	n.m.	n.m.	4 cc	Unknown (*S. intermedius* form lung puncture)	Latamoxef, ampicillin and cefotiam for 2 months	Slight upward gaze palsy and diplopia
Rajshekhar and Chandy	1994	Male/5	Bilateral 6th, 7th, 9th and 10th cranial nerve palsy, left hemiparesis	2 weeks	Acute	Mid-brain to medulla	n.m.	3.2 cm	15 cc	Nonhemolytic streptococci	Crystalline penicillin, gentamycin, and metronidazole i.v. 2 weeks. ampicillin for 6 weeks p.o.	Left hemiparesis
Nakajima *et al*.	1999	Female/51	Diplopia, right hemiparesis	2 days	Subacute	Pons	n.m.	n.m.	4 cc	*S. intermedius*	n.m.	Mild sensory deficit right
Fuentes *et al*.	2000	Female/2	Left 7th cranial nerve palsy and left hemiparesis	n.m.	Subacute	Right ponto-mesencephalic area	n.m.	15 mm	5 cc	Unknown	Cefotaxime, amoxicillin and metronidazole for 14 days, rinsing with rifamycine, switched to imipenem and amikacin for 31 days, amoxicillin for an extra month	Slight left hemiparesis
Beynon et al.	2012	Male/42	Gait disturbance, right hemiparesis	n.m.	Subacute	Mesencephalon	n.m.	n.m.	n.m.	*Listeria monocytogenes*	Ampicillin and ceftriaxone for 8 days switched to ampicillin, gentamicin	Tracheostomy and right hemiparesis

*n.m: Not mentioned. CNS: Coagulase negative *staphylococcus*, i.v.: Intravenous, *S. intermedius: Streptococcus intermedius*

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