Bacterial abscess of the medulla oblongata

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1. Introduction

A brainstem abscess is a rare and often fatal disease.¹ An isolated abscess of the medulla is rarer, with only six cases reported in the English literature, to the best of our knowledge.²⁻⁷ Most cases are diagnosed at autopsy. Because of their proximity to cranial nerve nuclei and multiple neural tracts as well as the limited space for expansion, these lesions can cause significant morbidity and mortality. Medical therapy alone or together with surgical treatment (stereotactic aspiration or microneurosurgical incision and drainage) has been described.

We describe a 69-year-old woman who presented with fever, decreased level of consciousness, and multiple cranial nerve palsies. MRI studies performed less than 24 hours apart demonstrated a rapidly enlarging, ring-enhancing brainstem mass. A right far-lateral craniotomy was performed with incision and drainage of frank pus. After an extended stay in the intensive care unit and rehabilitation unit, the patient recovered to a high level of function. This case provides insight into the diagnosis, management, and possible outcome of this rare disease.

2. Case report

This 69-year-old woman had a 3 day history of headache, nausea, vomiting, vertigo, and she difficulty with walking. On physical examination, she was sleepy but easily aroused and oriented. Her speech was dysarthric. Cranial nerve (CN) examination revealed a central CN VII palsy on the left, a weakened gag and cough, CN XII palsy on the right, and subjective decreased sensation to light touch on the left arm and leg. Her basic laboratory evaluation was normal (white blood cell count, 7.4 thousand cells/L). A CT scan of the brain was normal. The patient was admitted to the intensive care unit for neurological monitoring. An MRI of the brain showed a ring-enhancing lesion of the medulla oblongata (Fig. 1). The diagnosis was presumed to be tumor. On the morning of hospital day 2, her physical examination revealed worsening dysarthria, loss of the gag reflex, and an inability to safely maintain her airway. An endotracheal tube was inserted. A stereotactic cervical MRI for surgery showed significant enlargement of the medullary lesion compared to her brain MRI obtained less than 24 hours earlier (Fig. 2). A diagnosis of medullary abscess was suspected, and the patient underwent emergent surgery.

2.1. Operative procedure

After informed consent was obtained from appropriate family members, the patient was taken to the operating room. She was placed in the park-bench position with the right side uppermost. Pressure points were padded, and the patient was secured to the table. Brainstem evoked potentials were monitored during the procedure. A right far-lateral craniotomy was performed. Upon exposure of the right side of the brainstem, the medulla appeared swollen and hyperemic. Using stereotactic guidance, a small incision in the right side of the medulla was made between the rootlets of CN XI and CN XII. Several milliliters of frank purulent material were aspirated and sent for culture. The cavity was repeatedly irrigated with bacitracin-containing saline solution to insure that the abscess cavity was drained adequately. The dura was closed primarily, and the patient’s incision was closed in a standard fashion. A lumbar drain was placed, and the patient returned to the intensive care unit where broad antibiotic coverage was initiated.

2.2. Postoperative course

On postoperative day 1 the patient remained intubated and underwent CT scans of the chest, abdomen, and pelvis. No nidus of infection was discovered. Blood cultures drawn on admission revealed Streptococcus acidominimus in 2/2 cultures. Culture of the pus obtained at surgery also grew Streptococcus species. Antibiotic therapy was narrowed to metronidazole and ampicillin. Because the patient remained without a gag reflex, a percutaneous feeding tube and tracheostomy were placed on postoperative day 7. On postoperative day 8 she was transferred to an extended care facility. At transfer her Glasgow Coma Scale score was 11T, and her CN function was intact with the exception of bilateral palsies of CN XI and the right CN XII. She was able to follow commands briskly with all four extremities.

She underwent several weeks of extended skilled nursing care followed by several weeks of intensive inpatient rehabilitation. During this period, repeat MRIs showed evolving cerebritis at the site of the former abscess. Five months postoperatively, she was alert, oriented, and able to communicate easily. Her neurological examination was significant only for the right CN XII palsy. Bilateral palatal elevation was noted. Her strength was 4/5 on the right and 5/5 on the left with some increased tone on the right. She still required a feeding tube for continued difficulty swallowing. She was no longer on antibiotic therapy and had no evidence of further infection. An MRI performed at this time showed only minimal residual enhancement (Fig. 3).
3. Discussion

There are only six reports of isolated bacterial abscess of the medulla oblongata in the English literature. There has been one report each of a medullary abscess treated with medical therapy alone and with combined medical and surgical therapy, respectively. Good outcomes were obtained in both cases. The four patients diagnosed post-mortem. There are only six reports of isolated bacterial abscess of the medulla oblongata in the English literature. There has been one report each of a medullary abscess treated with medical therapy alone and with combined medical and surgical therapy, respectively. Good outcomes were obtained in both cases. The four patients diagnosed post-mortem.

Fig. 1. Post-gadolinium T1-weighted (A) axial and (B) sagittal MRIs obtained on hospital day 1 at the level of the medulla showing a ring-enhancing lesion in the medullary parenchyma eccentric to the right. (C) T2-weighted MRI showing marked intramedullary edema surrounding the lesion. Used with permission from Barrow Neurological Institute.

Fig. 2. Post-gadolinium T1-weighted MRI repeated less than 24 hours after the first MRI shows significant enlargement of the lesion in (A) axial and (B) sagittal planes. Used with permission from Barrow Neurological Institute.

Fig. 3. (A) Coronal, (B) axial, and (C) sagittal post-gadolinium T1-weighted MRIs obtained 5 months after surgery showing an area of enhancement in the medulla that is markedly reduced when compared to previous examinations. This region is thought to represent scar tissue. Used with permission from Barrow Neurological Institute.
postmortem had all been treated medically for presumed infection. Therefore, one of five patients survived who were treated medically. The presenting symptoms of medullary abscesses are protean because they depend on which tracts and nuclei are affected. In general, dysarthria, CN neuropathy, and ataxia are the initial symptoms. Fever and leukocytosis are unreliable signs.

The radiographic characteristics of medullary abscess are the same as those found elsewhere in the brain. CT scan is seldom helpful because the quality of imaging in the posterior fossa is low. MRI is preferred. The appearance of an abscess on imaging depends on whether the abscess is in the cerebritis or capsular stage. Mature lesions tend to be ring-enhancing and accompanied by restricted diffusion and significant edema.

In our patient, an expedient diagnosis and quick surgical intervention led to a good outcome in what has been largely a fatal disease. The increase in the size of the medullary abscess over the 24 hours between the first brain MRI and the stereotactic cervicomedullary junction MRI was significant and has not been reported previously. This documentation of rapid growth led us to consider medullary abscess as the most likely diagnosis and to expedite her surgical treatment. Although the diagnosis was uncertain, it is difficult to contemplate what might have been gained by delaying surgery.

With the diagnosis of abscess confirmed, we chose to drain the abscess and fenestrate it without removing the capsule; doing so would have surely left the patient devastated neurologically. Subsequent imaging confirmed that adequate medical therapy resulted in shrinking of the ring-enhancing portion of the lesion. The initial thickened rim of enhancement seen during the resolving phase represented cerebritis. Re-exploration at this stage would have been a mistake because this area of the brain has a propensity to recover, as it did over the ensuing months. We wish to emphasize that overaggressive debridement most likely would have been detrimental and that postoperative enhancement is to be expected when the capsule is left behind. As with other abscesses, after drainage, adequate medical therapy is the key to achieving a cure.

4. Conclusion

Historically, the rare neurological entity of medullary abscess has most often been fatal. Despite its rarity, a medullary abscess should be suspected in appropriate patients and a prompt diagnosis obtained with MRI. Aggressive surgical management together with medical therapy can halt clinical deterioration and ultimately result in an excellent functional outcome.

References


Dural metastasis from prostatic adenocarcinoma mimicking chronic subdural hematoma

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ABSTRACT

Dural metastasis is rare. In most reported cases, brain CT scan findings are mistaken for subdural hematoma or meningioma. We present here a 72-year-old male with a history of headache and progressive mental status changes. Brain CT scans suggested chronic subdural hematoma. However, the only surgical findings were diffuse thickening of the dura and sclerosis of the temporal bone. Histopathology revealed metastatic prostatic carcinoma. As the surgical approach and prognosis of chronic subdural hematoma and metastatic tumors are completely different, the differential diagnosis of these diseases is very important. A contrast-enhanced brain CT scan is recommended for patients who could possibly have dural metastases.

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1. Introduction

Dural metastases are rare. In most reported cases, brain CT findings are mistaken for subdural hematoma or meningioma. We describe the clinical presentation, imaging findings, and surgical intervention of a patient with dural metastasis from prostatic...