# **Brainstem abscess**

- Case Report: Pediatric pontine abscess and ecthyma gangrenosum due to Pseudomonas aeruginosa septicemia
- Clival canal defect: a rare cause of recurrent meningitis and fungal brain abscess in an immunecompetent child
- Early diagnosis of disseminated nocardiosis in a case of pyomyositis and brain abscesses exemplifies the importance of smear examination
- Infectious brain abscesses and granulomas: analysis of 110 episodes in adults
- Brainstem Cryptococcoma
- Perspective: Risks/adverse events for epidural spinal injections
- Uncommon Streptococcus Constellatus Meningitis Leading to Pulmonary Abscess and Brainstem Infarct in an Immunocompetent Patient
- Effectiveness of isavuconazole in invasive cerebral aspergillosis during hematopoietic stem cell transplantation in a pediatric patient with myelodysplastic syndrome: A case report

The brainstem is an uncommon site of a intracranial abscess.

Solitary brainstem abscesses of undetermined origin are quite rare and account for less than 1% of all intracranial abscesses  $1^{(1)}$  2).

# **Risk Factors**

They are often associated with immune disorders such as HIV infection and diabetes  $^{3)}$ .

# Microorganisms

Depending on the aggressiveness of the microorganism involved and on the patient's immunological condition, an infection may be extremely destructive and cause rapid clinical deterioration. The most common causative microorganisms identified are Streptococcus spp. and Staphylococcus spp<sup>4)</sup>.

# Diagnosis

Computed tomography scans show an irregular low-density lesion and, after contrast injection, observation of an enhanced-ring sign suggests the presence of a focal and/or cystic lesion, which is difficult to differentiate from other lesions. Magnetic resonance imaging is more sensitive and specific for the diagnosis. In the early phases of brain abscess development, an irregular, enhanced low signal suggests cerebritis. In the late stages, the vascularized capsule shows a ring-contrasted lesion. Using diffusion-weighted imaging, a restricted pattern can be observed. Spectroscopy can be useful for identifying a causative microorganism<sup>5)</sup>.

#### Treatment

The best method of treatment is not yet defined. It can be managed by medical treatment alone,

stereotactic aspiration of the pus and medical treatment, or microsurgical drainage surgical excision/drainage of the abscess.

Systemic antibiotic therapy is used for more than six weeks.

A microsurgical approach may be considered to be an important option for large abscesses that are multiloculated, close to the surface or contain thick fluid. Complete emptying of the purulent accumulation may diminish the required duration of antibiotic therapy <sup>6</sup>.

#### Prognosis

Such lesions were invariably fatal before 1974, when the arrival of computed tomography and magnetic resonance imaging improved the prognosis.

Mortality was very high, and surgery would be prohibitive. The development of computed tomography and magnetic resonance imaging, improvements in surgical techniques and broad-spectrum antibiotics have improved the prognosis <sup>7</sup>

### Case reports

#### 2015

A 7-month-old baby girl presented with lethargy and poor oral feeding. She had the mild fever for 1 month. Brain computed tomography revealed the hypodense lesion in the pons. Brain magnetic resonance images (MRI) showed around 1.4-cm-sized rim-enhanced mass with perilesional edema and internal hemorrhage in the pons. The cerebral blood volume was increased in the rim-enhanced area. The provisional diagnosis was DIPG, but the mass did not show the expansile mass with encasement of the basilar artery on the ventral pons.

The biopsy was done via the floor of the fourth ventricle, and the pathologic findings showed the many inflammatory cells and CD68-immunopositive macrophage which were compatible with abscess. The antibiotics with ceftriaxone and metronidazole were administrated for 11 weeks, and the follow-up MRI showed the slightly small enhanced lesion without central necrotic area. Three years later, follow-up MRI revealed the encephalomalacic change and atrophy of the pons. She had the stable neurologic deficit of left facial palsy and right hemiparesis.

The biopsy could be necessary for pontine lesions without typical radiologic findings of DIPG<sup>8)</sup>.

#### 2013

A 59-year-old man with dental caries who presented with a 4-day history of progressive dizziness, double vision, gait ataxia, emesis, and left facial and body numbness. Fever, suboccipital headache, and difficulties in urinating and defecating were noted on admission. Acute brainstem infarction and suspected aspiration pneumonia were then diagnosed. Magnetic resonance spectroscopy and diffusion-weighted imaging demonstrated a solitary pontine abscess. The neurologic deficits continued improvement after he completed 8 weeks of intravenous antibiotics. The successful nonsurgical treatment of the brainstem abscess in this case was based on high clinical suspicion,

2011

A case of a 20-month-old child with a solitary medulla oblongata abscess. The abscess appeared to be in close proximity to the anterior medulla oblongata, but preoperative planning based on diffusion tensor imaging (DTI) tractography motivated us to try to remove this lesion through a midline suboccipital approach. The ventral medulla oblongata abscess was surgically removed via a telovelar approach. At the anterior wall of the 4th ventricle, a fenestration was made with pus release and evacuation of the cavity. The child was discharged 1 week later with an uneventful and full recovery.

Modern imaging modalities of the nervous system can be very helpful in preoperative planning. Functional visualization of the nervous system provided by modern imaging techniques, such as the DTI tractography, can alter the classic topographic concept of surgical approach. In the case presented, approaching an anterior medulla oblongata abscess based on DTI tractography data, through a suboccipital midline transventricular approach, proved to be an effective and safe technique <sup>10</sup>.

#### 2001

A case of large brainstem abscess, treated successfully by surgical drainage after the failure of medical treatment. The patient had a large brainstem abscess extending from the midbrain down to the lower pons. She was in a poor neurological condition preoperatively, and was worsening despite intravenous antibiotics. The abscess was coming close to the surface in the lateral aspect of the midbrain. The presumed source of infection was multiple dental abscesses. The brainstem abscess was approached by a subtemporal transzygomatic approach and drained completely after making an incision on the lateral surface of the midbrain. After the operation, the patient showed steady improvement. At six months after the surgery, the patient was fully conscious, talking fluently, and walking with the help of a walker. Her hemiparesis and co-ordination were improving. Surgical drainage of a brainstem abscess is indicated when medical therapy fails. Proper anatomical knowledge of the brain-stem and the selection of appropriate surgical approach is important for safe drainage of the abscess<sup>11)</sup>.

A case with a good result shows the usefulness of early diagnosis, careful clinical and radiological monitoring and combined medical and surgical management. A child 2 1/2 years of age was admitted to the department of neurosurgery for diagnosis and treatment of a brain stem lesion. The clinical context and discovery of an intrabronchial foreign body, as well as neuroradiological investigations, suggested a diagnosis of brain stem abscess. Initial treatment with broad spectrum antibiotics with good cerebral penetration was associated with an increase in the size of the abscess and clinical worsening. Stereotactic aspiration of lesion was performed by a transpeduncular approach under CT guidance and general anaesthesia. Secondary thoracotomy enabled removal of an intrabronchial needle. After evacuation, in spite of failure to identify the organism, neurological deficit resolved rapidly and the lesion no longer appeared on CT. Management of a brain abscess and have good cerebral penetration. Medical treatment seems to suffice for small abscesses. A brain stem abscess with rapid clinical signs, together with current neuroradiogical diagnostic techniques, enables early

discovery of such abscesses when they are still small. Treatment of brain stem abscesses includes primary antibiotic therapy, then stereotaxic drainage when there is any diagnostic doubt, poor clinical tolerability or antibiotic resistance <sup>12</sup>.

1)

Arzoglou V, D'Angelo L, Koutzoglou M, Di Rocco C. Abscess of the medulla oblongata in a toddler: case report and technical considerations based on magnetic resonance imaging tractography. Neurosurgery. 2011;69(2):E483-6; discussion E486-7.

Nathoo N, Nadvi SS, Narotam PK, van Dellen JR. Brain abscess: management and outcome analysis of a computed tomography era experience with 973 patients. World Neurosurg. 2011;75(5-6):716-26; discussion 612-7.

3)

Kirchhoff DC, Kirchhoff DFB, Muoio V. Abscessos do tronco cerebral: apresentação de seis casos [Brain stem abscess: a study of six cases]. Arq Bras Neurocir. 2008;27(1):30-4.

Fulgham JR, Wijdicks EF, Wright AJ. Cure of a solitary brainstem abscess with antibiotic therapy: case report. Neurology. 1996;46(5):1451-4.

Lai PH, Li KT, Hsu SS, et al. Pyogenic brain abscess: findings from in vivo 1.5-T and 11.7-T in vitro proton MR spectroscopy. AJNR Am J Neuroradiol. 2005;26(2):279-88.

Hamamoto Filho PT, Zanini MA. Brainstem abscess of undetermined origin: microsurgical drainage and brief antibiotic therapy. Sao Paulo Med J. 2014;132(2):121-4. PubMed PMID: 24714994.

Rosenblum ML, Hoff JT, Norman D, Weinstein PR, Pitts L. Decreased mortality from brain abscesses since the advent of computerized tomography. J Neurosurg. 1978;49(5):658-68.

Kim JH, Jung TY, Jung SH, Lee KH, Kim SK. Pediatric brainstem abscess with hemorrhage mimicking diffuse intrinsic pontine glioma: a case report. Childs Nerv Syst. 2015 Dec;31(12):2359-62. doi: 10.1007/s00381-015-2801-8. Epub 2015 Jul 3. PubMed PMID: 26139548.

Chen MH, Kao HW, Cheng CA. Complete resolution of a solitary pontine abscess in a patient with dental caries. Am J Emerg Med. 2013 May;31(5):892.e3-4. doi: 10.1016/j.ajem.2013.01.005. Epub 2013 Feb 8. PubMed PMID: 23399347.

Arzoglou V, D'Angelo L, Koutzoglou M, Di Rocco C. Abscess of the medulla oblongata in a toddler: case report and technical considerations based on magnetic resonance imaging tractography. Neurosurgery. 2011 Aug;69(2):E483-6; discussion E486-7. doi: DOI: 10.1227/NEU.0b013e318218cf37. PubMed PMID: 21792143.

11)

Sarma S, Sekhar LN. Brain-stem abscess successfully treated by microsurgical drainage: a case report. Neurol Res. 2001 Dec;23(8):855-61. Review. PubMed PMID: 11760878.

Fuentes S, Bouillot P, Regis J, Lena G, Choux M. Management of brain stem abscess. Br J Neurosurg. 2001 Feb;15(1):57-62. Review. PubMed PMID: 11303665.

From: https://neurosurgerywiki.com/wiki/ - **Neurosurgery Wiki** 

Permanent link: https://neurosurgerywiki.com/wiki/doku.php?id=brainstem\_abscess

Last update: 2024/06/07 02:59



Neurosurgery Wiki - https://neurosurgerywiki.com/wiki/