

Invasive Listeriosis-Atypical Presentation with Delayed Diagnosis

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Abstract

Invasive listeriosis with brain infection remains a diagnostic challenge with an early treatment need to reduce morbidity and mortality. Not only is a foodborne pathogen with a rising incidence but also responsible for variable clinical manifestations with an initial extensive differential diagnosis to be considered. Imaging studies such as CT scan and MRI are helpful, but the former is frequently normal and the findings of the latter are only useful when it correlates with a suggestive medical history, physical exam and positive blood or cerebrospinal fluid cultures. We report a case of invasive listeriosis with concomitant lung and brain infection, whose uncommon presentation delayed prompt diagnosis of the latter. Our aim is to raise awareness for these atypical presentations since it is so difficult to identify *Listeria* infection and patient's outcome depends on early antibiotic treatment start.

Keywords: Listeriosis; Brain infection; Atypical presentation

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Introduction

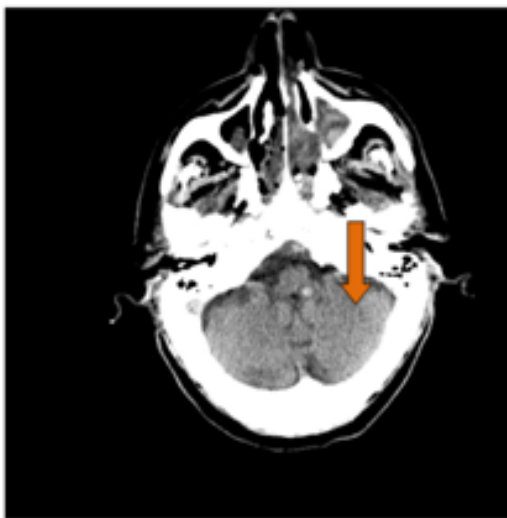
Invasive listeriosis with central nervous system or lung infection are considered rare but severe presentations affecting high-risk patients such as the elderly. Rhombencephalitis is described in the literature as having a characteristic biphasic course [1] but atypical presentations have been reported [2-4] so early diagnosis is still a challenge. We present a rare case of listeriosis with simultaneous rhombencephalitis and pneumonia presentation, the first initially misdiagnosed as a neoplastic brain lesion. Patient's evolution and microbiological results allowed correct diagnosis and despite late start of antibiotics the patient survived.

Clinical Report

A 82 year old man with a past medical history of Hypertension, Ischemic stroke with mild left-sided hemiparesis sequela, Diabetes and Smoking habits was admitted in the emergency department with complaints of headache and vomiting for 2 weeks, followed by dyspnea and pleuritic thoracic pain for 1 week. Epidemiological history was irrelevant. Physical examination revealed the following neurological deficit: left-sided horizontal nystagmus. Neck stiffness was not present. He was afebrile and vital signs were unremarkable. Auscultation revealed crackles on the right lung base consistent with a lung condensation in the chest x-ray. Pneumonia diagnosis was made. Laboratory values were in the normal range. Non-enhanced cranial CT scan revealed a small

spontaneous hyperdense image in the fourth ventricle left lateral recess suggestive of a possible cavernoma (Figure 1). The patient was started on empirical antibiotics for community-acquired pneumonia and was later transferred to a medical ward with the presumptive diagnosis of brainstem cavernoma.

Figure 1: Cranial CT scan showing small hyperdense image (orange arrow) in the fourth ventricle left lateral recess suggestive of cavernoma.



On the second day of hospitalization, he developed a temperature spike followed by a sudden episode of unresponsiveness with left side gaze, but he recovered spontaneously after a few seconds. He was hypotensive and hypoxemic, requiring ICU admission where he began successful resuscitation, but did not need intubation. His condition improved temporarily, but two days later his clinical status worsened, with severe hypoxemia and chest CT scan revealed bilateral diffuse consolidation consistent with ARDS (Figure 2). Meanwhile, *Listeria monocytogenes* was yielded from blood cultures, so *Listeria pneumonia* was considered and the patient began Ampicillin plus Gentamycin. Later, he developed respiratory improvement and was able to perform bronchoscopy-*Listeria monocytogenes* was isolated from bronchoalveolar lavage cultures. Since the patient had a brain stem lesion, for better characterization, he performed cranial MRI whose images revealed a hyperintense left paramedial

medullar lesion (in T2-weighted sequences) consistent with rhombencephalitis (Figure 3, 4). Lumbar puncture was made, but cerebrospinal fluid was negative for bacteria. He completed an 8 week antibiotic therapy with a long period of rehabilitation. He was discharged with no residual deficit or chronic respiratory failure. Neuroimaging follow-up after 4 weeks showed brain lesion improvement (Figure 5).

Figure 2: Chest CT scan with bilateral diffuse consolidation consistent with ARDS

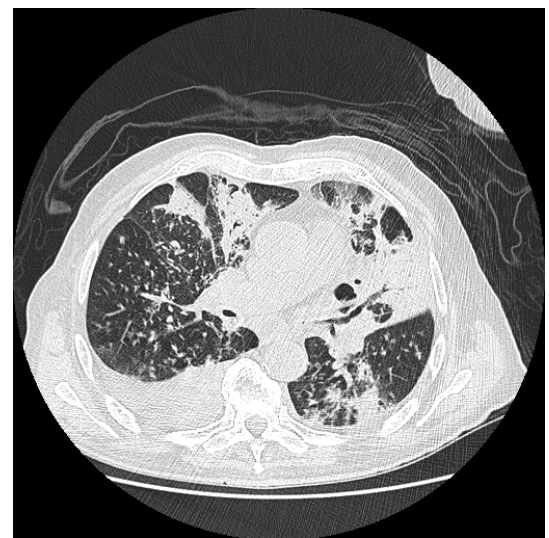


Figure 3: Cranial MRI (axial view) showing hyperintense left paramedial medullar lesion (in T2-weighted sequences) consistent with rhombencephalitis (orange arrow)

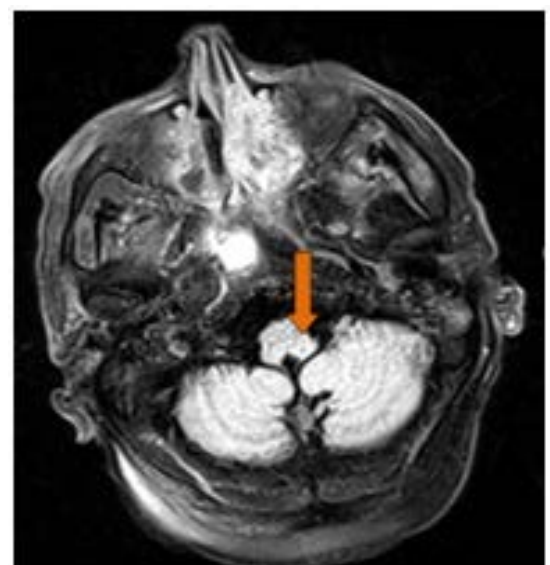
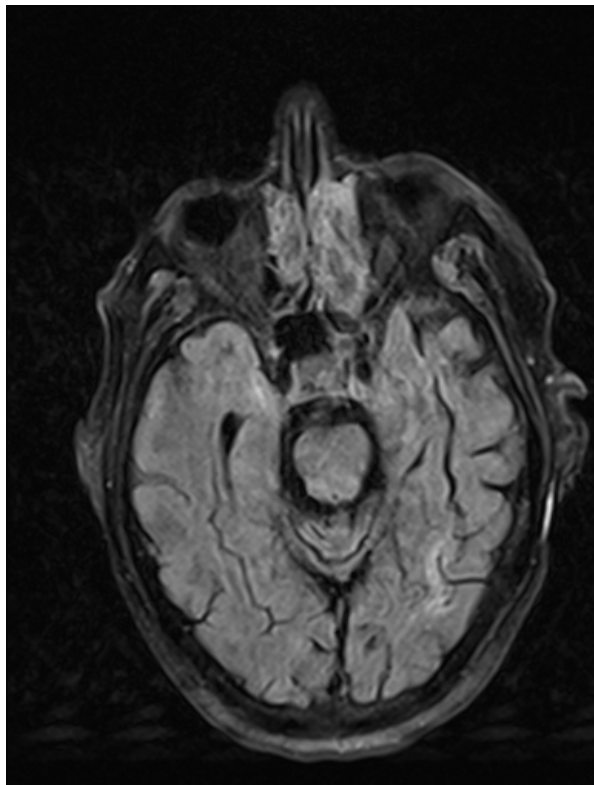


Figure 4: Cranial MRI (coronal view) showing hyperintense left paramedial medullar lesion (in T2-weighted sequences) consistent with rhombencephalitis (orange arrow)



Figure 5: Cranial MRI (axial view) showing improvement in rhombencephalitis (after 4 weeks of treatment)



Discussion

Elderly people are particularly susceptible to *Listeria* infection [4]. Although it usually behaves as a self-limited gastrointestinal illness, an invasive form with central nervous system involvement is not uncommon in these high-risk group of patients [5-11]. Rhombencephalitis is one form of presentation. It is described as having a characteristic biphasic evolution[1], with non specific flu-like symptoms initially, followed by neurological brain stem signs, especially assymetrical cranial-nerve deficits. Atypical cases such as afebrile presentations [2,4,6] or even symmetrical cranial nerve palsies [3] have been reported, delaying diagnosis and increasing mortality. Moreover, an extensive differential diagnosis must frequently be considered: stroke, neoplastic lesions, vasculitic disorders, neurosarcoidosis, tuberculosis or multiple sclerosis are all mimickers. In our case a neoplastic lesion was first hypothesized due to a subacute afebrile presentation and also because CT scan imaging showed small areas of hemorrhage, which is very suggestive for cavernoma. Pneumonia is even less described, with only two cases reported in old male patients without any other comorbidities. Other patients had neoplastic conditions under chemotherapy [12]. Presentation is similar to pneumonia due to other bacterial pathogens, so it requires a low index of suspicion.

We believe our case is unique for two reasons:

- Unusual presentation with nystagmus as a subtle and the only initial deficit followed by a neurological fluctuating course with sudden consciousness deterioration and a subsequent fast and spontaneous recovery.
- Simultaneous presentation with lung and brain infection never reported in the literature review. Pneumonia was a confounding factor for initial adequate brain infection diagnosis because thoracic symptoms were the main complaints.

Diabetes and old age are known factors for invasive disease form because immunity mechanisms are less effective. Host cell-mediated immunity plays the main role in *Listeria* infection, so

in general a better regulation of diabetes is believed to improve cellular functions [13]. In our case the patient had an adequate metabolic control so other mechanisms must play a part.

Conclusion: Invasive listeriosis is still difficult to diagnosis due to increasing atypical presentations and lack of evident epidemiological history.

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