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Sepsis-Associated Dural Calcification

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Abstract **Clinical Image**

This case involved the elderly woman with alcoholic cirrhosis and periodontal disease who developed suppurative spondylitis, multiple abscesses, and multi-organ failure. Although she initially improved following intensive care treatment, she developed calcification of both the myocardium and the cranial dura mater on day 70. Post-septic dural calcification has not been previously reported, and this case represents the first such report. As a hypothesis regarding the mechanism of onset, it is presumed that the effects of sepsis extended to the dura mater, and that abnormal calcification of the dura mater progressed due to the effects of various therapeutic interventions. These findings were limited to imaging results and had no clinical implications. This unique case adds a new cause to the list of known etiologies for cranial dural calcification.

Keywords: Sepsis; Dura Matter; Calcification.

INTRODUCTION

A 61-year-old woman suffering from alcoholic cirrhosis and periodontal disease experienced pain in the back of her neck; the pain worsened a few days later, and within two weeks, she found it difficult to move her body. She was transferred to our hospital with a diagnosis of sepsis of unknown origin (Day 1). Antibiotic therapy was initiated with meropenem and vancomycin; however, she progressed to multiple organ failure and required mechanical ventilation and continuous hemodiafiltration. On Day 8, to identify the source of infection and re-evaluate the patient's overall condition, a repeat contrast-enhanced computed tomographic scan (CT) and blood tests revealed pyogenic spondylitis, a posterior pharyngeal wall abscess, a right iliopsoas abscess, and a left paraspinal erector spinae abscess. The patient was treated with pulse steroid therapy. Based on the results of susceptibility testing of the blood culture (Staphylococcus aureus) and the patient's clinical response, the antibiotics were switched to cefazolin and metronidazole on day 18. Dialysis was discontinued on day 21 and the ventilator was weaned on day 38. The head CT scan on day 53 revealed myocardial calcification along with a reduction in the abscess. On day 70, the patient developed slurred speech. The head CT scan showed no abnormalities other than dural calcification (**Figure 1**). Subsequently, the patient developed altered mental status; a head magnetic resonance image led to a diagnosis of metronidazole encephalopathy, and all antibiotics were discontinued. Improvement in the level of consciousness was minimal, and she was transferred to a rehabilitation hospital on day 189.

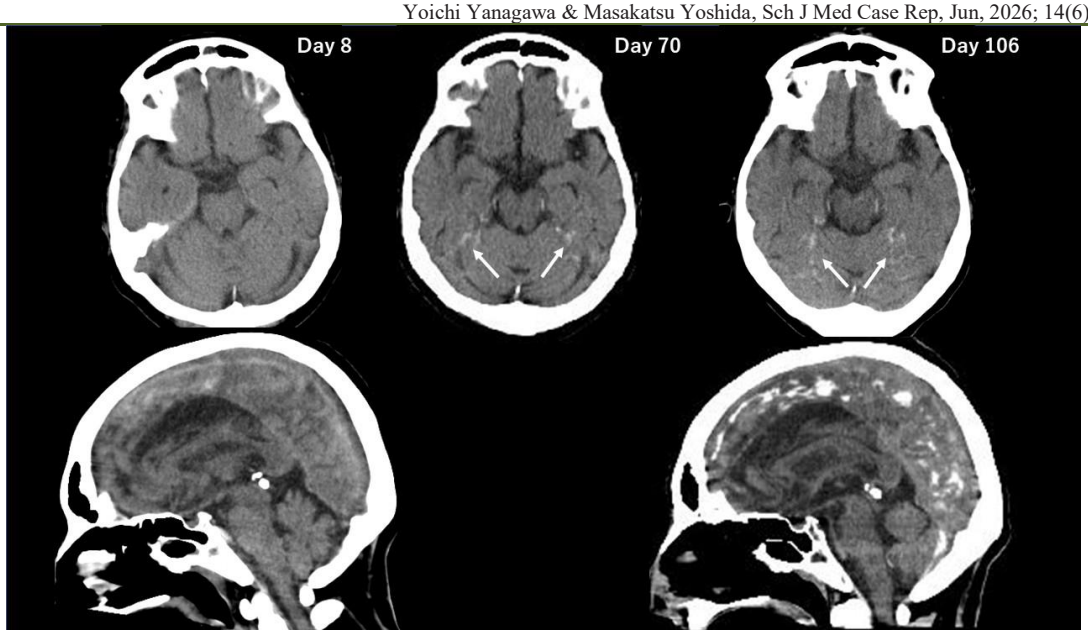

Figure 1: Head computed tomographic scans on days 8, 70, and 106

Calcification, which was not observed on day 8, appeared in the cerebellar tentorium on day 70. On day 106, there was no significant change in the calcification of the cerebellar tentorium. In the sagittal section, calcifications of the falx cerebri were also more evident compared to day 8.

This case involved the elderly woman with alcoholic cirrhosis and periodontal disease who developed suppurative spondylitis, multiple abscesses, and multi-organ failure. Although she initially improved following intensive care treatment, she developed calcification of both the myocardium and the cranial dura mater.

Post-septic myocardial calcification is extremely rare, though there have been reported cases. [1,2] In contrast, post-septic dural calcification has not been previously reported, and this case represents the first such report. While dural calcification is a common phenomenon associated with aging, it is considered abnormal only when it is marked and progressive, even in adults. [3] Previous reports have identified the following underlying conditions: chronic subdural hematoma, dural osteoma, intracranial hypotension, sarcoidosis, tuberculosis, hyperparathyroidism, tumors infiltrating the dura mater, chronic renal failure, nephrotic systemic fibrosis, tumors adjacent to the dura mater, and concurrent cranial bone thickening.[3] In this case, the patient never exhibited abnormal calcium levels during the course of the disease, and after discontinuing dialysis, the creatinine levels normalized, ruling out chronic renal failure. Based on the above, the causes of dural calcification mentioned earlier did not apply to this case. As a hypothesis regarding the mechanism of onset, it is presumed that the effects of sepsis extended to the dura mater, and that abnormal calcification of the dura mater progressed due to the effects of various therapeutic interventions. These findings were limited to imaging results and had no clinical implications. This unique case adds a new cause to the list of known etiologies for cranial dural calcification.

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