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Periodontitis Leading to Septic Lateral Sinus Thrombosis and Pulmonary Embolism: A Case Summary

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1. Introduction

Cerebral venous sinus thrombosis (CVST) caused by infection, known as septic CVST, is now relatively uncommon in the antibiotic era. It can involve different venous sinuses of the brain, mainly the cavernous sinus, lateral sinus, and superior sagittal sinus. Each type of sinus thrombosis is usually linked to specific sources of infection due to differences in venous drainage pathways and anatomical relationships.

Septic lateral sinus thrombosis is most often associated with infections of the middle ear or mastoid air cells. In contrast, cavernous sinus thrombosis is more commonly related to infections of the face, teeth, and paranasal sinuses because of direct venous connections.

Periodontitis is a chronic bacterial infection of the gums that affects a significant portion of the population. Although it is usually considered a localized oral disease, it has been increasingly linked to systemic conditions such as infective endocarditis and atherosclerosis. However, its association with thrombosis in cerebral venous sinuses has rarely been reported. In this report, we describe a rare case where untreated periodontitis was likely the primary source of infection leading to septic lateral sinus thrombosis and pulmonary embolism.

2. Case Presentation

A 42-year-old woman with no significant past medical history presented with a one-month history of persistent headache and intermittent fever. The headache was mainly located in the left temporal region and gradually worsened, eventually becoming severe enough to interfere with walking and sitting.

On admission, the patient had a high fever (38.8°C) and showed signs of neck stiffness. Neurological examination revealed weakness in the right upper limb.

Brain magnetic resonance imaging demonstrated thrombosis in the left transverse and sigmoid sinuses, confirming cerebral venous sinus thrombosis. Laboratory tests showed elevated white blood cell count, suggesting infection. Cerebrospinal fluid (CSF) analysis revealed increased pressure, elevated protein levels, low glucose, and a high number of white blood cells dominated by neutrophils, all consistent with an infectious process affecting the central nervous system.

Further investigations revealed additional complications. Chest imaging showed multiple lung nodules, some with cavitation, consistent with septic pulmonary emboli. This indicated that infection-related blood clots had spread from the central nervous system to the lungs.

The patient was treated with broad-spectrum intravenous antibiotics, including ceftriaxone, vancomycin, and metronidazole. After treatment, her fever and headache gradually improved. Follow-up CSF studies showed reduced inflammation, and lung lesions also began to resolve.

Blood cultures identified Peptostreptococcus micros, an anaerobic bacterium commonly found in the oral cavity. Because no ear or sinus infection was detected by specialists, attention turned to the oral cavity as the likely infection source. A dental examination revealed severe generalized periodontitis.

Additional investigations, including echocardiography and coagulation studies, ruled out heart infection and underlying clotting disorders. Based on these findings, periodontitis was considered the primary source of bacteremia, which likely led to cerebral venous sinus thrombosis and septic emboli to the lungs.

After discharge, the patient received comprehensive dental treatment and was advised on strict oral hygiene. During more than two years of follow-up, no recurrence of symptoms was observed.

3. Discussion

This case highlights an uncommon but important complication of untreated periodontitis. Chronic oral infections can serve as a continuous source of bacteria entering the bloodstream, leading to systemic infection and thrombus formation in distant organs.

In this patient, the presence of Peptostreptococcus micros in blood cultures strongly suggested an oral origin. Periodontitis likely caused repeated episodes of bacteremia, which triggered both infection and clot formation within the cerebral venous system. The resulting septic thrombus extended to the transverse and sigmoid sinuses.

Pulmonary embolism occurred simultaneously, which may be explained by either dissemination of infected emboli from

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the cerebral venous system or a generalized prothrombotic inflammatory state induced by infection.

Although septic CVST is most commonly associated with ear or sinus infections, this case demonstrates that dental infections can also serve as a hidden but significant source. Bacteria from the oral cavity can enter the bloodstream through daily activities such as chewing or tooth brushing, especially in individuals with poor oral hygiene. Once in circulation, these organisms may infect distant sites or trigger clot formation.

The successful outcome in this case emphasizes the importance of early identification of the infection source. Treatment with antibiotics resolved the acute infection, while definitive dental care prevented recurrence.

Conclusion

Although rare, periodontitis should be considered a potential underlying cause in patients presenting with septic cerebral venous sinus thrombosis. This case underscores the importance of evaluating oral health in patients with unexplained cerebral venous thrombosis or systemic septic emboli. Early dental intervention, along with appropriate antimicrobial therapy, plays a crucial role in preventing recurrence and improving outcomes.

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