DOI: 10.21088/ijem.2395.311X.11425.10

Indian Journal of Emergency Medicine
Volume 11 Number 4, October–December 2025

CASE REPORT

Dental Infection Leading to Brain Abscess

Sangeeta Sao[1], Sreelakshmi K.T.[2], Anita Rawat[3], Kishalay Datta[4]

HOW TO CITE THIS ARTICLE:

Sangeeta Sao, Sreelakshmi K.T., Anita Rawat, *et al.* Dental Infection Leading to Brain Abscess. Ind J Emerg Med. 2025; 11(4): 267-269.

ABSTRACT

A brain abscess is a serious neurological condition involving the accumulation of pus within the brain tissue, often resulting from infections spreading from other parts of the body. Though commonly linked to infections of the ear, sinuses, or lungs, dental infections are a less frequent but noteworthy source. Poor oral hygiene, untreated dental caries, or periodontal disease can lead to local infections that may either have hematogenous spread or through contiguous structures to the brain, especially in immunocompromised individuals or those with predisposing factors. In this case report, we discuss brain abscess arising secondary to a neglected dental infection. The patient presented with non-specific symptoms such as headache, fever, and confusion, eventually developing focal neurological deficits. Neuroimaging confirmed the presence of a cerebral abscess, and further evaluation revealed an underlying dental source. Cultures often show mixed organisms, commonly including anaerobic bacteria typically found in the oral cavity. Management involved surgical drainage of the abscess and broad-spectrum intravenous antibiotics, later tailored according to culture sensitivity. The case underscores the critical importance of timely dental intervention and the potential for severe complications if oral infections are left untreated. Early diagnosis and a multidisciplinary approach are essential for favourable outcomes in such cases.

KEYWORDS

• Dental infection • Brain abscess • Streptococcus intermedius

AUTHOR'S AFFILIATION:

[1] Resident, Department of Emergency Medicine, Max Super Speciality Hospital, Shalimar Bagh, New Delhi, India.

[2] Resident, Department of Emergency Medicine, Max Super Speciality Hospital, Shalimar Bagh, New Delhi, India.

[3] Principal Consultant, Department of Emergency Medicine, Max Super Speciality Hospital, Shalimar Bagh, New Delhi, India.

[4] HOD, Department of Emergency Medicine, Max Super Speciality Hospital, Shalimar Bagh, New Delhi, India.

CORRESPONDING AUTHOR:

Sangeeta Sao, Resident, Department of Emergency Medicine, Max Super Speciality Hospital, Shalimar Bagh,New Delhi, India. **E-mail:** drsangeetasao.02@gmail.com

Received: 04-08-2025 **Accepted:** 05-09-2025

Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution NonCommercial 4.0 License (http://www.creativecommons.org/licenses/by-nc/4.0/) which permits non-Commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the Red Flower Publication and Open Access pages (https://www.rfppl.co.in)

INTRODUCTION

Brain abscess is a critical and potentially life-threatening intracranial infection characterized by a localized collection of pus within the brain parenchyma. Although rare in occurrence, it remains a significant neurological emergency requiring urgent diagnosis and management. The condition typically arises from the spread of infection from nearby structures such as the middle ear, sinuses, or lungs.[1] However, in some instances, brain abscesses may originate from a less commonly suspected source dental infections.

Dental infections, particularly those involving the roots of teeth and periodontal tissues, can enter the bloodstream and disseminate to distant organs, including the brain. Such hematogenous spread, although infrequent, has been documented in immunocompromised individuals and patients with poor oral hygiene.[2] The pathophysiology involves oral pathogens breaching local barriers, entering systemic circulation, and seeding in cerebral tissue, especially in the setting of impaired host defences or a disrupted blood-brain barrier.

The clinical presentation of brain abscess is often vague in the initial stages, including symptoms such as fever, headache, or confusion. This nonspecific nature may delay diagnosis, increasing the risk of complications such as raised intracranial pressure or neurological deficits.[3] This highlights the need for early recognition and multidisciplinary collaboration between dental, medical, and neurosurgical teams. This report aims to explore the clinical relevance of odontogenic infections as a cause of brain abscess and underscores the importance of dental health in preventing such severe complications.

CASE

An 16-year-old male child patient, weighing around 45kg (informant father, mother, aunt) was brought to the emergency department (ED) of our hospital with complaints of headache with high grade fever for last 2-3 weeks. On examination in the ED, patient also complained of generalised progressive weakness. His initial vitals in the ED: pulse rate – 114/min, blood pressure – 100/60 mmHg, Oxygen saturation – 98% on room air, Random Blood Sugar – 105 mg/dL, GCS – E4V5M6 (15/15), pain score (out of 10, 10 being the highest) 6. He looked tired. Further examination was negative for meningeal sings (Kernig's, Brudunzski). His old records showed he was constantly visiting the hospital for complaints of headache for last 1 month, was managed conservatively with analgesics.

During the initial assessment in the ED, the patient suddenly had an episode of generalised tonic-clonic seizure. An immediate measure (*Inj Lorazepam 2mg IV*) with positioning and oxygenation was done.

An urgent radiological test was done for the patient (images), which showed abscess in the left fronto-temporal region of the brain. Urgent diagnosis of brain abscess was established and all related questions were answered (seizure, fever). As the patient was wheeled into the ED, the patient again had an episode of seizure, was managed conservatively. On further examining for tongue bite (following seizure), the patient was found to have a swelling near the upper left upper molar (image), which on further detailed examination, found to be an abscess.

The patient was immediately shifted to the operation theatre under the care of neurosurgeon for urgent drainage of abscess and preventing further neurological damage. The patient was started on broad spectrum antibiotics with cefotaxime and metronidazole. Corticosteroid treatment using methylprednisolone was introduced the next day following surgery and maintained for a duration of six days. Once the results of the microbiological analysis became available, antibiotic therapy was adjusted accordingly. Microscopic examination of the sample revealed Gram-positive cocci arranged in chains. Both aerobic and anaerobic cultures confirmed the presence of Streptococcus intermedius.

Following 14 days of intensive therapy with antibiotics and steroid therapy and dental abscess treatment, patient was shifted to ward and after total 28 days of hospitalisation, the patient was completely recovered with no episodes of fever or headache or limb weakness.

Post discharge, a 6 month follow up was done and the patient remained symptom free and recovered completely from the disease.

DISCUSSION

Brain abscesses can originate from various infectious sources, making diagnosis complex. When no other apparent cause is found, and microbiological testing reveals bacteria commonly present in the oral cavity, a dental origin should be strongly considered. Radiographic evidence and clinical signs of dental infection can further support this diagnosis. Among the many microorganisms residing in the oral environment, ***Streptococcus intermedius*** is notably significant. This bacterium, part of the normal flora of both the oral cavity and gastrointestinal tract, has been repeatedly linked to brain abscesses in both paediatric and adult populations.[4]

The identification of ***S.intermedius*** in brain abscess cultures should prompt healthcare providers to investigate the possibility of an underlying dental infection.[4] Unfortunately, such connections are sometimes overlooked, delaying appropriate dental interventions. In the case being discussed, the time lapse between the neurosurgical drainage of the abscess and the eventual dental treatment was primarily due to an initial lack of awareness regarding the potential dental source of the infection.[5]

Although the patient ultimately recovered completely without any lasting neurological damage, this outcome may not be typical. Brain abscesses carry significant risk, with reported morbidity as high as 53% and mortality rates reaching up to 16%.[6] These figures highlight the critical importance of identifying all potential sources of infection promptly. Early detection of a dental aetiology, in particular, can lead to more targeted therapy, reducing the risk of complications.[7] Therefore, clinicians should maintain a high index of suspicion for dental origins, especially when common oral bacteria like *S. intermedius* are isolated and other primary infection sites have been excluded.

CONCLUSION

Brain abscess secondary to dental infection, though uncommon, is a serious condition that requires timely diagnosis and intervention. The presence of oral bacteria such as *Streptococcus intermedius* in culture should alert clinicians to consider an odontogenic source, particularly when no other primary infection site is evident. Delayed recognition of a dental origin can postpone appropriate treatment, potentially increasing the risk of complications. This case highlights the importance of thorough oral and dental evaluations in patients presenting with intracranial infections of unknown origin. Early identification of a dental source, combined with prompt neurosurgical and dental management, can significantly improve outcomes. Given the high morbidity and mortality associated with brain abscesses, a multidisciplinary approach involving neurologists, infectious disease specialists, dentists, and radiologists is essential. Greater awareness among healthcare providers about the potential link between dental infections and brain abscesses can help ensure timely and effective treatment, reducing the burden of this life-threatening condition.

Abbreviations:

ED - Emergency Department

REFERENCES

1. Sahbudak Bal Z., Eraslan C., Bolat E., *et al*. Brain abscess in children: A rare but serious infection. *Clin Pediatr (Phila)*. 2017; 57(5): 574–9. https://doi.org/10.1177/0009922817733301
2. Goodkin H.P., Harper M.B., Pomeroy S.L. Intracerebral abscess in children: historical trends at Children's Hospital Boston. *Pediatrics*. 2004; 113(6): 1765–70. https://doi.org/10.1542/peds.113.6.1765
3. Hibberd C.E., Nguyen T.D. Brain abscess secondary to a dental infection in an 11-year-old child: Case report. *J Can Dent Assoc*. 2012; 78.
4. Mishra A.K., Fournier P.E. The role of *Streptococcus intermedius* in brain abscess. *Eur J Clin Microbiol Infect Dis*. 2013; 32(4): 477–83. https://doi.org/10.1007/s10096-012-1782-8
5. Atiq M., Ahmed U.S., Allana S.S., Chishti K.N. Brain abscess in children. *Indian J Pediatr*. 2006; 73(5): 401–4. https://doi.org/10.1007/bf02758560
6. Ong C.T., Tsai C.F., Wong Y.S., Chen SC.C. Epidemiology of brain abscess in Taiwan: a 14-year population-based cohort study. *PLoS One*. 2017; 12(5): e0176705. https://doi.org/10.1371/journal.pone.0176705
7. Raffaldi I., Garazzino S., Castelli Gattinara G., *et al*. Brain abscesses in children: an Italian multicentre study. *Epidemiol Infect*. 2017; 145(13): 2848–55. https://doi.org/10.1017/S0950268817001583