

Infective Endocarditis, Result of Chronic Periodontal Disease: A Real and Present Danger

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Abstract

Introduction: Endocarditis is an inflammation of the endocardium, the inner lining of the heart and heart valves. It is usually caused by bacteria and is associated with high mortality and morbidity. It can result from transient bacteremia from the oral cavity. *Streptococci* are the primary colonizers of tooth surface and are instrumental in development of the complex oral biofilm, dental plaque. *Streptococcus sanguinis* is one of the abundant oral commensals but can become pathogenic when given an opportunity. **Case Presentation:** During examination of a young female patient in the Department of Periodontology we came across a rare condition of Infective Endocarditis with ischemic infarct of brain also with poor periodontal health. **Conclusion:** The symptoms like headache and intermittent fever without underlying dental and periodontal cause should not be overlooked as it might result in Infective Endocarditis. An early diagnosis is must to treat such life-threatening conditions to prevent further complications.

Keywords: Infective endocarditis, *Streptococcus sanguinis*, ischemic infarct, periodontal therapy.

BACKGROUND

Infective endocarditis is an infectious, potentially life-threatening disease of heart valve or endocardium caused by bacteremia that affects different organs, tissue including oral cavity [1]. Though it is most often found in high-risk groups with congenital or acquired cardiac defects, the patients with no underlying heart conditions cannot be overlooked. In low-risk patients, one of the main etiological factors for the development of this disease is poor periodontal health [2].

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Oral cavity is a hub of a large number of microbes which directly or indirectly affects the systemic health [3]. *Streptococcus sanguinis* is one such microbe, which usually act as a normal commensal of the oral cavity, but when given an opportunity might act as a pathogen. This pathogen might gain entry into the blood stream resulting in transient bacteremia and subsequently affects the endocardium and leads to development of Infective Endocarditis [4]. The present case report describes the case of a young female patient who was diagnosed with infective endocarditis associated with ischemic infarct of brain, as a consequence of poor periodontal health.

CLINICAL PRESENTATION

A 38-year-old female, reported to the Department of Periodontology for pain originating in oral cavity, along with headache associated with intermittent fever. Oral examination revealed

moderate gingival inflammation with swelling, bleeding gums and clinical attachment loss (Figure 1). OPG was advised which revealed Generalized Chronic Periodontitis, but no frank cause of fever related to dental and periodontal origin was found (Figure 2). She was then referred to the Department of Medicine, where she was diagnosed with migraine and medications were prescribed. Symptoms subsided initially after taking medication but reappeared after few days, this time accompanied with partial loss of vision in the morning for about 2 hrs, which improved on its own. Patient was then referred to neurologist and MRI brain was advised; the results were suggestive of acute ischemic infarct. 2-D echo was also done, which revealed severe mitral regurgitation with acquired etiology being either mitral valve prolapses or vegetations of anterior mitral line. Blood culture was also done which revealed the presence of *Streptococcus sanguinis* and diagnosis of Infective Endocarditis was thus made, and the treatment was started. Patient was then referred back to the Department of Periodontology for continuation of dental treatment.



Figure 1. Showing moderate gingival inflammation with swelling.



Figure 2. OPG showing Generalized Chronic Periodontitis.

CASE MANAGEMENT

Periodontal treatment was started under antibiotic prophylaxis i.e. 2 g Cap. Amoxicillin stat 1 hr prior to procedure and after pre-procedural chlorhexidine 0.2% rinsing. Ultrasonic scaling was done, followed by scaling and root planning with hand instruments, following full mouth disinfection protocol. Recall visits were scheduled every three months and reduction in patient's signs and symptoms was found (Figure 3).

CLINICAL OUTCOMES

Two weeks after the periodontal treatment was rendered, there was definite reduction in gingival inflammation and the condition continued to Improve thereafter.

DISCUSSION

Oral hygiene maintenance has an impact both directly and indirectly on the systemic health. Inadequacy to maintain healthy oral conditions often results in accumulation of dental plaque, which harbors a large number of microorganisms. Literature suggests that number of causative microorganisms responsible for Infective Endocarditis are increased in patient with poor oral hygiene and Chronic Periodontitis. Even routine activities like chewing food and tooth brushing might result in transient bacteremia [5] and triggers thrombus formation [6]. *Streptococcus sanguinis* is one of the most frequent pathogens associated with Infective Endocarditis, comprising of about 18–30% of cases [7].

Since the patient had no associated risk factors as IV drug abuse, history of congenital heart disease for development of infective endocarditis except for the poor periodontal health, her poor periodontal health might have led to the dissemination of bacteria resulting in *S. sanguinis* vegetations at endocardium.

One of the possible pathological mechanisms in the present case could be that pathogen might have gained access into the blood stream transiently from the oral cavity resulting in bacterial colonization at valvular surface. This might have resulted in a proinflammatory response at altered cardiac valve surface, including incremental expression of IL-6, 8, monocyte chemotactic peptide [8]. Besides, an increase in platelet aggregation and activation might have possibly resulted in growth of vegetation on endocardium [9] that would have detached and disseminated to form emboli, leading to ischemic infarct as evidenced on MRI which reveals few ischemic changes in midbrain and pons (Figure 4).



Figure 3. Showing gingival condition after treatment

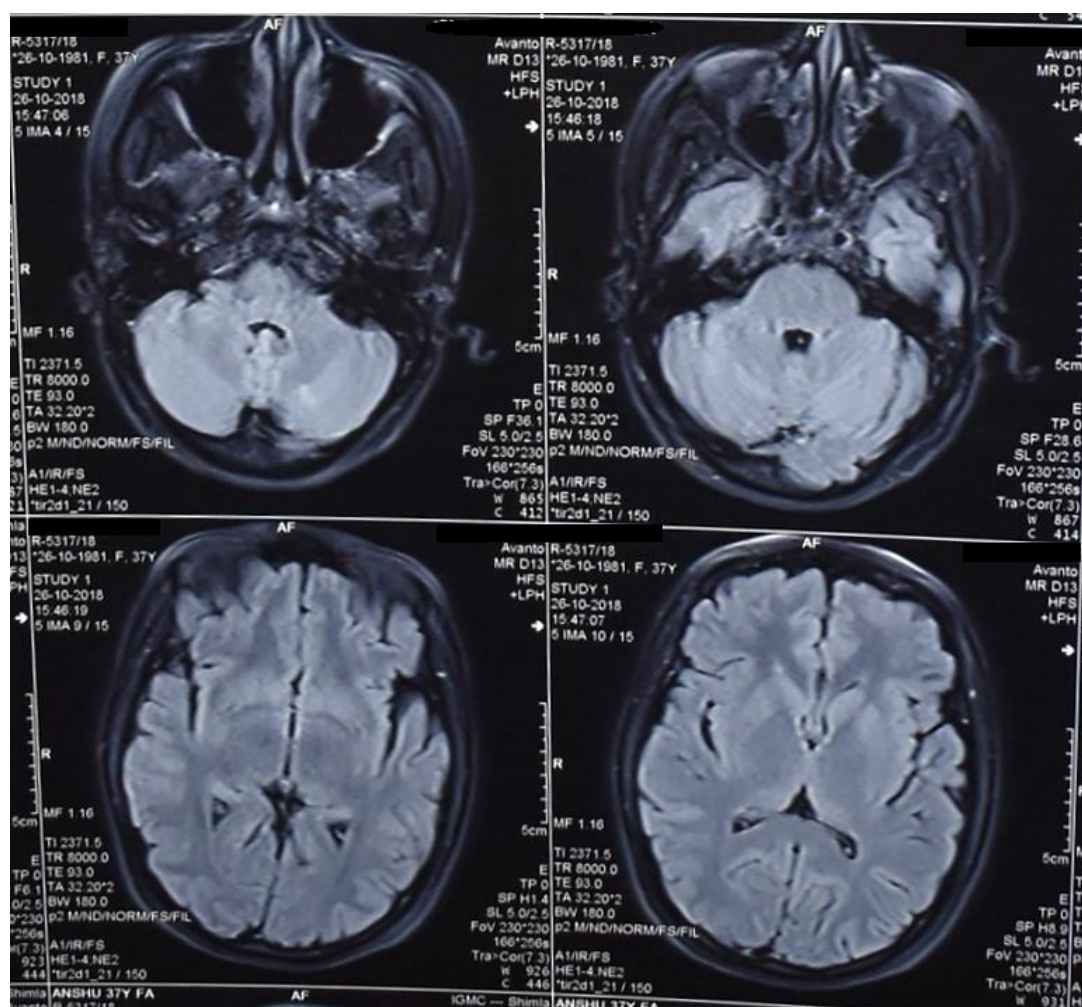


Figure 4. MRI scan showing ischemic changes in midbrain and pons.

As it is unanimously recognized that poor oral hygiene is a crucial risk factor related to periodontal and endocardium health, it becomes imperative to decrease the bacterial load in oral cavity, which would subsequently prevent the cascade of events resulting in Infective Endocarditis. Both systemic and local antimicrobial prophylaxis can be considered for the treatment. The rationale behind the use of systemic antibiotics is to reduce or eliminate the risk of transient bacteraemia [10]. The local antimicrobials as an adjunct to systemic antibiotics are known to reduce the oral bacterial burden. The American Heart Association guidelines propose the use of a chlorhexidine rinse prior to invasive procedures [11–13]. Besides the use of antimicrobials, full mouth disinfection using scaling and root planing is also indicated. An important fact to be considered is that the ultrasonic scaler may remove part of bacteria by the flushing action of the water irrigation and thus should be preferred in such cases. So, in the light of current evidence, the present case was managed with single sitting full mouth disinfection using pre-procedural rinses with chlorhexidine, scaling and root planing under antibiotic coverage [14].

Early diagnosis of infective endocarditis associated with poor oral hygiene is important. The possibility of Infective Endocarditis and its complications must be taken into consideration in periodontal patients with symptoms like headache and intermittent fever.

CONCLUSION

Longstanding periodontal disease can result in development of Infective Endocarditis. An early diagnosis of this life-threatening disease associated with poor oral hygiene is important. Symptoms

like headache, intermittent fever with no underlying dental and periodontal cause, should not be ignored by dental practitioner. Thoroughly planned periodontal treatment with timely referral to physician can help in early diagnosis of disease and prevention of further complications.

Why is this case new information?	Poor periodontal health had resulted in the formation of ischemic infarct of brain.
What are the keys to successful management of this case?	Early diagnosis of poor periodontal talking health induced Infective Endocarditis and ischemic infarct can prevent further life-threatening complications
What are the primary limitations to success in this case?	Since this is the first ever reported case of Infective Endocarditis and Ischemic infarct caused by poor periodontal health, the evidence needs to be supported by further studies

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