



Case Report

The invisible threat deep caries progression without pain – (A case report in a young adult)

Safiya Bhat^{1*} 

¹Dept. of Oral and Maxillofacial Pathology Microbiology and Forensic Odontology, Yamuna Institute of Dental Sciences and Research, Mansurpur, Haryana, India.

Abstract

Dental caries continues to be one of the most widespread chronic conditions globally, often advancing silently without noticeable symptoms until significant structural damage occurs. This case report describes a 21-year-old female student with a deep carious lesion in the mandibular first molar discovered incidentally during a routine examination. Despite the absence of spontaneous pain, radiographic and pulp testing indicated irreversible pulpitis requiring endodontic management. This report emphasizes the insidious nature of caries progression, lifestyle-related etiological contributors among young adults, and the importance of early diagnosis through routine dental assessments. Preventive efforts, patient education, and timely treatment remain central to halting disease progression and avoiding complex interventions.

Keywords: Dental caries, Acid-producing bacteria, Pulpal pathology

Received: 03-05-2025; **Accepted:** 13-12-2025; **Available Online:** 05-01-2026

This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/), which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprint@ipinnovative.com

1. Introduction

Dental caries is a complex, multifactorial, progressive disease resulting from interactions among cariogenic bacteria, fermentable carbohydrates, salivary components, and host susceptibility over time.¹ The World Health Organization reports that nearly all adults—close to 100%—experience dental caries at some point in their lives.² While often associated with pediatric populations, caries remains a significant concern in adolescents and young adults as well, especially those navigating academic stress, irregular routines, and dietary changes.³

Caries development follows a well-understood dynamic process beginning with enamel demineralization, progressing into dentin, and ultimately threatening pulpal vitality.⁴ Dietary sugars fuel bacterial metabolism, leading to acid production and pH reduction, which accelerates demineralization.⁵ When oral hygiene is inconsistent—a common issue among college students—disease progression becomes more pronounced, often remaining unnoticed until symptoms emerge.

However, the presence or absence of symptoms does not always correlate with pathological severity. Deep lesions may remain asymptomatic until pulpal inflammation becomes extensive, making caries detection heavily dependent on routine evaluations.⁶

This case highlights a clinically relevant issue the silent progression of deep caries in young adults with minimal or no subjective symptoms. It reinforces the need for preventive strategies tailored specifically to individuals with high academic or lifestyle-related risk factors.

2. Case Presentation

2.1. Patient information

A 21-year-old female student reported to the dental clinic for a routine oral examination. She denied any persistent pain but mentioned occasional sensitivity to cold beverages, which she attributed to dietary habits rather than pathology.

*Corresponding author: Safiya Bhat
Email: 2216drsafiyaabhat@gmail.com

3. Medical & Social History

1. Medical history No systemic illnesses; no medications.
2. Dental history Last dental visit over 3 years prior.
3. Oral hygiene practices Brushed twice daily using fluoridated toothpaste; rarely flossed.
4. Lifestyle habits Frequent consumption of sugary snacks and carbonated drinks during late-night study sessions.
5. Stress level High due to academic workload—an important contributing factor to irregular diet and oral hygiene lapses.

4. Clinical Examination

1. Intraoral examination revealed
2. Extensive cavitated lesion on occlusal and mesial surfaces of tooth #46.
3. Brown discoloration with softened dentin upon probing.
4. No swelling, sinus tract, or abnormal mobility.
5. Gingival tissues appeared healthy with no periodontal involvement.

The lesion appeared chronic, with dentin destruction suggesting significant bacterial activity and long-standing demineralization.

5. Pulp Vitality Tests

Thermal test (cold spray) Prolonged response, indicating irreversible pulpitis.

Electric pulp testing Heightened sensitivity confirming pulpal irritation.

6. Radiographic Assessment

A periapical radiograph revealed;

1. A well-defined radiolucency extending through dentin and approaching the pulp chamber. **Figure 1**
2. Intact lamina dura and absence of periapical radiolucency. **Figure 2**
3. No widening of periodontal ligament space.

These findings indicated deep caries approximating the pulp without periapical involvement **Figure 1& Figure 2**



Figure 1: Radiographic assessment 1

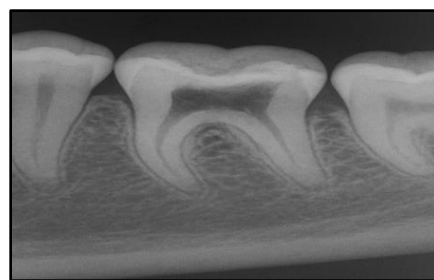


Figure 2: Radiographic assessment 2

6.1. Diagnosis

Tooth #46 Deep dental caries with irreversible pulpitis.

7. Management

The treatment plan was discussed in detail, including consequences of delaying intervention. The patient consented to root canal therapy and full coronal restoration.

8. Endodontic Treatment

Operative Procedures

8.1. Anesthesia and Isolation

1. Local anesthesia administered (2% lidocaine with epinephrine 1:100,000).
2. Rubber dam isolation ensured sterile operative field.

8.2. Access opening & Canal identification

1. Access created on the occlusal surface.
2. Three canals identified mesiobuccal, mesiolingual, and distal.

8.3. Biomechanical preparation

1. Cleaning and shaping performed using rotary NiTi instruments.
2. Irrigation protocol

3% sodium hypochlorite during instrumentation.
Final rinse with 17% EDTA to remove smear layer.

8.3. Obturation

Canals dried and obturated using gutta-percha with resin-based sealer via lateral condensation technique. Temporary restoration applied to protect the tooth until the final restorative phase.

8.4. Definitive restoration

Two weeks later, the patient reported complete relief of symptoms.

1. Composite resin core build-up was performed to reinforce the remaining tooth structure.
2. Crown preparation completed under standard protocols.
3. A full-coverage ceramic crown was fabricated and cemented, restoring function and aesthetics.

8.5. Post-treatment care

1. Reinforced oral hygiene instructions, especially interdental cleaning.
2. Dietary counseling focusing on sugar intake reduction and timing of consumption.
3. Scheduled recall visits for monitoring.

9. Discussion

This case presents several important clinical themes relevant to caries management in young adults.

9.1. Asymptomatic deep caries

Caries progression often remains silent until extensive pulpal involvement occurs. Studies indicate that deep dentinal caries may remain painless, especially in young individuals with robust pulpal reparative abilities.⁶ Early pulpal inflammation is frequently subclinical.⁷

9.2. High-risk lifestyle factors

College and university students experience elevated risk of caries due to

1. Irregular meals and late-night snacking.
2. Increased sugar consumption.
3. Poor sleep cycles affecting immune regulation.
4. Stress-related neglect of hygiene.⁸

Even individuals with adequate brushing habits may develop caries due to inadequate interdental cleaning and pH imbalance in biofilms

10. Importance of Radiographic Evaluation

Detecting deep lesions requires combining clinical findings with radiographic analysis. Visual inspection alone often underestimates lesion depth. In this case, radiography revealed the full extent of carious penetration, preventing progression to necrosis and periapical pathology.

11. Endodontic Treatment as the Gold Standard

For teeth diagnosed with irreversible pulpitis, root canal therapy remains the treatment of choice. When performed under aseptic conditions, success rates are high and long-term prognosis is favourable. The presence of a sealed definitive coronal restoration significantly enhances treatment longevity.

12. Role of Patient Education

Education is essential in modifying risk factors. By understanding the link between lifestyle habits and dental health, patients become active participants in prevention. This case highlights that patient-centered approaches are invaluable in long-term disease control.

13. Conclusion

This case demonstrates the stealthy progression of deep dental caries in a young adult who exhibited minimal symptoms. It emphasizes the need for regular dental check-ups, early radiographic assessment, and timely intervention to avoid invasive treatments. Young adults, particularly those under academic stress, are highly susceptible to caries progression due to lifestyle patterns. Dental professionals must provide personalized preventive counseling and consistent reinforcement to reduce disease incidence and severity.

14. Source of Funding

None.

15. Conflict of Interest

None.

References

1. Fejerskov O, Kidd EAM. Dental Caries The Disease and Its Clinical Management. 2nd ed. Oxford Blackwell Munksgaard; 2008. P. 350.
2. Pitts NB, Zero DT, Marsh PD, et al. Dental caries. *Nat Rev Dis Primers*. 2017;317030. <https://doi:10.1038/nrdp.2017.30>
3. Selwitz RH, Ismail AI, Pitts NB. Dental caries. *Lancet*. 2007;369: 51–59. [https://doi:10.1016/S0140-6736\(07\)60031-2](https://doi:10.1016/S0140-6736(07)60031-2)
4. Al-Ansari AA. Prevalence of dental caries among young adults. *Saudi Med J*. 2014;35:531 <https://doi:10.1155/2022/7132681>
5. Kidd E, Fejerskov O. Histopathology of carious enamel and dentin. *J Dent Res*. 2004;83C35–8.
6. Marsh PD. Dental plaque as a biofilm. *Compend Contin Educ Dent*. 2009;3076–78. 30(2):76-8,
7. Bader JD. Identifying carious lesions. *J Public Health Dent*. 2002;62(4):201–13. <https://doi:https://doi:10.1111/j.1752-7325.2002.tb03446.x>
8. Ng V, Rahbaran S, Lewsey J, Gulabivala K. Outcome of primary root canal treatment: systematic review of the literature – Part 1. Effects of study characteristics on probability of success. *Int Endod J*. 2007;40(12):921-39. <https://doi:10.1111/j.1365-2591.2007.01322.x>.

Cite this article: Bhat S. The invisible threat deep caries progression without pain – (A case report in a young adult). *J Advanc Oral Health*. 2025;2(2):71-73.