GMR
The Original

BEYOND THE CLINICAL FACADE: ONE CLINICAL PRESENTATION, THREE DISTINCT ETIOLOGIES

Dr Pallavi Nair[1], Dr. Mohan S.[2], Dr. Sankar Vinod Vichattu[3], Dr. Hisham M. Ibrahim[4], Dr. Sunil R[5], Dr Devya Dev[6]

[1]PG resident oral medicine radiology.
[2]Professor & HOD, Department of Oral & Maxillofacial Surgery
[3]Professor, Department of Oral & Maxillofacial Surgery
[4]Professor, Department of Oral & Maxillofacial Surgery
[5]Reader, Department of Oral & Maxillofacial Surgery.
[6]PG resident oral medicine and radiology

ABSTRACT
Dental caries is a multifactorial disease from the complex interaction of microbial, dietary, environmental, and host-related factors. However, an apparently routine carious lesion may occasionally indicate an underlying systemic, therapeutic, or behavioral etiology. A comprehensive history consist of medical conditions, medications, oral habits, and previous therapeutic interventions can provide important diagnostic clues and help establish the underlying etiology. Accurate etiological diagnosis influences management and preventive strategies, emphasizing that caries treatment should extend beyond restoration. We report three cases in which meticulous history taking, integrated with clinical and radiographic assessment, is essential for accurate etiological diagnosis and appropriate management.

Keywords: Methamphetamine; Radiation caries; Sjögren syndrome; Xerostomia; History taking

INTRODUCTION
Dental caries may appear clinically familiar, yet its underlying cause may remain hidden. Its development reflects a complex interaction of host, behavioral, systemic, and treatment-related factors, with saliva serving as a vital protective determinant through its buffering, cleansing, antimicrobial, and remineralizing functions. Impaired salivary flow can therefore significantly increase caries susceptibility. [1] When extensive or rapidly progressive caries exhibits a similar clinical pattern, identifying its etiology can be challenging. Although clinical examination establishes the extent and distribution of destruction, a targeted history may reveal hidden systemic conditions, previous treatments, behavioral factors, and salivary dysfunction.[2] When clinical appearance converges, history may hold the key to diagnostic divergence.

CASE REPORTS
Case 1
21-year-old male patient presented with a complaint of decayed teeth and poor aesthetics. Intraoral examination revealed widespread cervical caries involving the maxillary teeth. Oral mucosa appeared dry with reduced salivary pool. Panoramic radiograph revealed radiolucencies involving the cervical aspects of multiple teeth, with periapical lesions in 28, 46, 47, and 48. There was no evidence of any significant periodontal bone loss.
In view of the unusual extent and rampant pattern of carious involvement, a detailed history was made. Patient admitted a 2-year history of methamphetamine abuse through inhalation and intranasal use. He also reported consuming large quantities of carbonated beverages on daily basis to alleviate the dryness of his mouth.
Case 2
63 years old female patient reported with a complaint of decayed teeth. Her medical history revealed that she was diagnosed with rheumatoid arthritis 12 years back and was currently receiving DMARD therapy. Extraoral examination revealed apparent dryness of the eyes. Intraoral examination revealed generalized dryness of the oral mucosa, reduced salivary flow, and depapillation of the tongue. Multiple root stumps were noted.
An unstimulated salivary flow rate was measured and was found to be 0.2mL/min. Laboratory investigations revealed a positive rheumatoid factor. Panoramic radiograph revealed multiple root stumps with no significant osseous changes in the jaws. Minor salivary gland biopsy was performed. Histopathological examination revealed two dense lymphocytic infiltration of more than fifty lymphocyte per four-millimeter square of glandular tissue seen with acinar atrophy and ductal hyperplasia.
Case 3
66-year-old male patient reported with a complaint of decayed teeth. His medical history revealed that he was diagnosed histopathologically as squamous cell carcinoma of tongue and treated with hemiglossectomy, radiotherapy before 3 years. Intraoral examination revealed reduced mouth opening, multiple root stumps, widespread cervical caries, and dryness of oral mucosa with reduced salivary flow. Panoramic radiograph revealed

multiple residual roots, widespread cervical caries with pulp exposure and moderate generalized horizontal bone loss. Multiple surgical ligating clips noted on the right posterior mandible.

TREATMENT AND FOLLOW-UP

All patients were advised full-mouth rehabilitation following stabilization of active caries. Preventive measures included oral-hygiene instruction, dietary counseling, and management of xerostomia. Case 1 patient was counselled regarding ill effects of methamphetamine use on oral health and referred for addiction management. Case 2 and 3 patients were advised frequent intake of water and the use of sugar-free chewing gum to stimulate salivary secretion. Case 3 patient was advised mouth-opening exercises and wet mouth mouthwash. Patients were advised for 1 month follow-up to assess treatment response.

DISCUSSION

This case series highlights that a similar clinical presentation of extensive dental caries may reflect diverse underlying etiologies. While clinical examination defines the extent and pattern of destruction, a focused history remains pivotal in uncovering the cause and directing further diagnostic evaluation. [3,4]

Methamphetamine use can significantly compromise salivary protection, with reduced salivary flow diminishing the oral cavity's buffering, cleansing, and remineralizing capacity, thereby promoting a highly cariogenic environment and the characteristic "meth mouth" presentation. Skrypnyk et al. reported xerostomia and rampant caries among the prominent oral manifestations of methamphetamine abuse.[5]

In Sjögren syndrome, autoimmune destruction of the salivary glands results in marked hyposalivation, depriving the teeth of saliva's essential buffering, cleansing, antimicrobial, and remineralizing functions. This altered oral environment markedly increases caries susceptibility, often producing rapidly progressive and multifocal cervical or root caries. Nagi et al. further highlighted the association of Sjögren syndrome with oral microbial dysbiosis and increased levels of caries-associated microorganisms.[6]

Radiation-associated caries is a rapidly progressive complication of head-and-neck radiotherapy, primarily linked to hyposalivation and radiation-induced changes in tooth structure. Loss of salivary buffering, cleansing, and remineralizing functions, together with increased enamel and dentin susceptibility, creates a highly cariogenic environment, often manifesting as characteristic cervical caries. Palmier et al. highlighted its multifactorial and aggressive nature.[7]

Identification of the underlying etiology is crucial not only for diagnosis but also for appropriate treatment and prevention of further dental destruction. A comprehensive etiology-specific treatment approach should be adopted. In methamphetamine or other ATS use, dental care should be accompanied with identification of drug abuse and cessation counselling, In Sjögren syndrome, xerostomia management, topical fluoride, preventive care, and medical management of the underlying autoimmune condition are essential. In radiation-induced caries, daily fluoride application, xerostomia management, meticulous oral hygiene, dietary counselling, and regular follow-up are recommended alongside definitive dental treatment.

REFERENCES

1)Alamoudi A, Alamoudi R, Gazzaz Y, Alqahtani AM. Role of salivary biomarkers in diagnosis and detection of dental caries: a systematic review. Diagnostics (Basel). 2022;12(12):3080.

2)Almohaya MA, et al. Oral health effects of ecstasy (MDMA) and methamphetamine: a narrative review. *Front Oral Health.* 2025;6:1645445.

3)Moore C, McLister C, Cardwell C, O'Neill C, Donnelly M, McKenna G. Dental caries following radiotherapy for head and neck cancer: A systematic review. *Oral Oncol.* 2020;100:104484.

4)Tang Y, Nie H, Zhang Y, et al. Effects of Sjogren's syndrome and high sugar diet on oral microbiome in patients with rampant caries: a clinical study**.** *BMC Oral Health.* 2024;24:361.

5)Skrypnyk M, Skrypnyk R, Petrushanko T, Skikevych M, Petrushanko V, Skrypnyk I. Case Report: Unusual oral cavity changes associated with methamphetamine abuse. *Front Public Health.* 2025;13:1473584.

6) Nagi R, Santhosh Kumar S, Sheth M, Deshpande A, Khan J. Association between oral microbiome dysbiosis and Sjogren Syndrome. A systematic review of clinical studies. Arch Oral Biol. 2025;172:106167.

7) Palmier NR, Migliorati CA, Prado-Ribeiro AC, de Oliveira MCQ, Vechiato Filho AJ, de Goes MF, et al. Radiation-related caries: current diagnostic, prognostic, and management paradigms. Oral Surg Oral Med Oral Pathol Oral Radiol. 2020;130(1):52-62.