

Oral Manifestations of “Meth Mouth”: A Case Report

Ilser Turkyilmaz, DDS, PhD

Abstract

Aim: The aim of the documentation of this clinical case is to make clinicians aware of “meth mouth” and the medical risks associated with this serious condition.

Background: Methamphetamine is a very addictive, powerful stimulant that increases wakefulness and physical activity and can produce other effects such as cardiac dysrhythmias, hypertension, hallucinations, and violent behavior. Dental patients abusing methamphetamine can present with poor oral hygiene, xerostomia, rampant caries (“meth mouth”), and excessive tooth wear. Oral rehabilitation of patients using methamphetamine can be challenging.

Case Description: A 30-year-old Caucasian woman presented with dental pain, bad breath, and self-reported poor esthetics. A comprehensive examination including her medical history, panoramic radiograph, and intraoral examination revealed 19 carious lesions, which is not very common for a healthy adult. She reported her use of methamphetamine for five years and had not experienced any major carious episodes before she started using the drug.

Summary: The patient’s medical and dental histories along with radiographic and clinical findings lead to a diagnosis of “meth mouth.” Although three different dental treatment modalities (either conventional or implant-supported) have been offered to the patient since August 2007, the patient has yet to initiate any treatment.



Clinical Significance: This clinical case showing oral manifestations of meth mouth was presented to help dental practitioners recognize and manage patients who may be abusing methamphetamines. Dental practitioners also may be skeptical about the reliability of appointment keeping by these patients, as they frequently miss their appointments without reasonable justification.

Keywords: Methamphetamine, meth mouth, drug, dentistry, caries

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Introduction

Methamphetamine (“crank,” “ice,” “crystal,” “glass,” “meth,” “chalk,” “fire,” or “speed”) is a synthetic n-methyl homologue of amphetamine and was first synthesized in Japan in 1893.^{1,2} It is a white, odorless, bitter-tasting crystalline powder that readily dissolves in water or alcohol.³ Methamphetamine powder also can be purified into the “ice” form, which is often smoked and extremely addictive. Methamphetamine is a powerful stimulant and even small amounts can increase wakefulness and physical activity while decreasing appetite.^{3,4} An overdose of methamphetamine produces angina, dyspnea, diaphoresis, palpitations, nausea and vomiting, confusion, and hallucinations. It may even result in ventricular fibrillation, acute cardiac failure, cardiovascular collapse, hyperthermia, convulsions, and eventually death if not treated immediately.^{4,5}

The World Health Organization reports more than 35 million people worldwide use methamphetamine.⁵ Methamphetamine abuse is a serious problem in the United States, Mexico, South America, Middle East, Asia, and Australia. In 2005, the National Findings Report by the U.S. National Survey on Drug Use and Health stated that nearly 10.4 million (4.3% of respondents) people aged 12 years old and older used methamphetamine at least once in their lifetime.⁴

Methamphetamine Abuse and Dentistry

If a patient reports his or her abuse of methamphetamine, the dentist should carefully interview and examine the patient for associated dental problems. However, in reality such dental patients are less than eager to declare their abuse of drugs due to fear of being ostracized or legally prosecuted.⁶ Because methamphetamine users generally use other illicit drugs including marijuana, cocaine, or heroin, dental practitioners should be meticulous at looking for signs and symptoms related to drug abuse.

Comprehensive medical and dental histories, a general physical assessment, and a complete oral examination must be performed.⁷ Telltale cutaneous lesions on the arms such as subcutaneous abscesses, cellulitis, and

thrombophlebitis often indicate parenteral abuse of drugs. Patients who frequently miss appointments without good reasons or show mood swings, violent outbursts, and paranoid behaviors may be drug abusers and should be fastidiously considered.⁷ Methamphetamine users are at an increased risk for acquiring and transmitting blood-borne diseases.^{4,8} Transmission of the human immunodeficiency virus (HIV) and hepatitis B or C virus is increased in people administering methamphetamine intravenously and by methamphetamine-using men who have sex with men.⁹

There are several oral manifestations of the abusive use of methamphetamine that dental clinicians must consider during the care of these patients.

Xerostomia

Long-term methamphetamine abuse leads to xerostomia, rampant caries, bad taste, bruxism, and muscle trismus.^{10,11} Although the cause of methamphetamine-induced xerostomia is uncertain, it may be due to activation of alpha-adrenergic receptors in the vasculature of salivary glands causing vasoconstriction and a reduction in salivary flow.¹⁰ An alternative mechanism suggested by some investigators is the stimulation by methamphetamine of inhibitory alpha 2 adrenoreceptors in the salivary nuclei may decrease the salivary flow rate.¹¹

The risk for dental caries, erosion of enamel, and periodontal disease is considerably increased by xerostomia.¹² The term “meth mouth” has been used to describe the rampant caries often found in methamphetamine users.¹ The pattern of caries involving the buccal smooth surfaces of the teeth and the interproximal surfaces of the anterior teeth is typical in chronic methamphetamine users.¹⁰



Methamphetamine users describe their teeth as “blackened, stained, rotting, crumbling, or falling apart.”¹³ An increased number and severity of carious lesions in methamphetamine users also is caused by poor oral hygiene, a high intake of refined carbohydrates, and an increased acidity in the oral cavity from oral intake of methamphetamine, high-calorie carbonated beverages, and/or vomiting.^{10,14} Restoration of teeth with advanced carious lesions due to methamphetamine use is generally hopeless, and the damaged teeth are usually extracted.¹⁵

Patients with methamphetamine-induced xerostomia should drink 8–10 glasses of water per day and avoid caffeine, tobacco, and alcoholic beverages due to their diuretic effect.¹⁶ Some relief from methamphetamine-induced xerostomia may be obtained by using salivary substitutes, oral moisturizers, and artificial salivas. However, these products often have a short-term effect since they are retained in the oral cavity for such a short time. Pharmacological stimulation of the salivary glands is another method to treat xerostomia. The use of pilocarpine HCl (Salagen) and cevimeline HCL (Evovac) for the treatment of hyposalivation in patients with Sjögren’s syndrome has been recently introduced. Pilocarpine, which is an alkaloid, parasympathomimetic drug, stimulates smooth muscle and exocrine secretions (increased salivary flow).¹⁷ Increased production of saliva from minor salivary glands also may be important for protection against oral disease, since minor salivary glands produce most of the secretory IgA, which is an important component of the oral cavity’s immunological defense system.¹⁸ Dental practitioners should consult with the patient’s physician to determine if there are any contraindications before prescribing pilocarpine.

Bruxism

Bruxism and excessive tooth wear are more likely in chronic methamphetamine users, as they have extremely high energy and neuromuscular activity, which can cause parafunctional jaw activity and bruxism.^{13,14} Amphetamine-like stimulant drugs can generate choreiform motor activity in facial and masticatory muscles and result in unusual patterns of tooth wear.¹⁵ Bruxism and muscle trismus can aggravate the effects and progress of periodontal disease and produce

symptoms of temporomandibular disorders, such as tenderness in the temporomandibular joints and masseter muscles.¹⁴

Pain Management

Because oral health is usually poor in methamphetamine users, they may present in the dental office due to dental pain. A common situation is the person seeks dental care when trying to regain control of his or her health.¹⁹ It is essential the patient gain a clear understanding his/her medical status by the dental practitioner in order to achieve the most effective and safest treatment possible. Methamphetamine’s duration of action is generally 8–12 hours, but can be up to 24 hours in cases of intoxication.⁵ If the patient has used methamphetamine within the last 24 hours, the vasoconstrictor in the local anesthetic could result in further sympathetic drive to the cardiovascular system, putting the patient at increased risk for cardiac dysrhythmias, hypertension, myocardial infarction, and cerebrovascular accidents.²⁰ If local anesthesia is needed for dental treatment, a local anesthetic without vasoconstrictor should be used (e.g., 3% carbocaine).²¹ Care should be taken when a methamphetamine user requires analgesic medications as the patient may be abusing other drugs including prescription medications like opioids.

A complete dental examination is needed to diagnose the source of the pain. Some methamphetamine users may try to obtain drugs from dentists by demanding pain medication for a dental problem. Methamphetamine users may claim to be allergic to codeine in an attempt to obtain a stronger drug such as morphine or hydrocodone. Nonsteroidal anti-inflammatory drugs can be safely used in these cases.²¹

Case Description

Diagnosis

A 30-year-old woman with a history of methamphetamine use was self-referred for an examination in August 2007. Her chief complaints were dental pain, bad breath, and poor esthetics. A comprehensive examination including her medical history, a panoramic radiograph, and an intraoral examination revealed 19 carious lesions, which is not very common for a healthy adult (Figures 1–5).



Figure 1. Frontal intraoral view of the patient showing rampant caries extending into the pulp chamber in the maxillary anterior teeth.



Figure 2. From the right side, an intraoral view of the patient showing rampant cervical caries.



Figure 3. From the left side, intraoral view of the patient showing cervical calculus, inflamed soft tissue, rampant caries, and a deep bite.

Several teeth (teeth #2, 6–11, 18, 19, and 31) had carious lesions extending into the pulp chamber. The periodontal evaluation revealed a generalized soft-tissue inflammation with widespread bleeding upon probing, supragingival calculus deposits, and heavy stain, indicating advanced gingivitis but no bone loss. The medical and dental histories indicated the patient had been using methamphetamine for five years and she stated she had not experienced any major exposure to dental caries before she started using methamphetamine. After completing the oral examination, photographs were taken, and maxillary and mandibular alginate impressions



Figure 4. A. Occlusal view of the maxillary arch. B. Frontal view of the dentition.

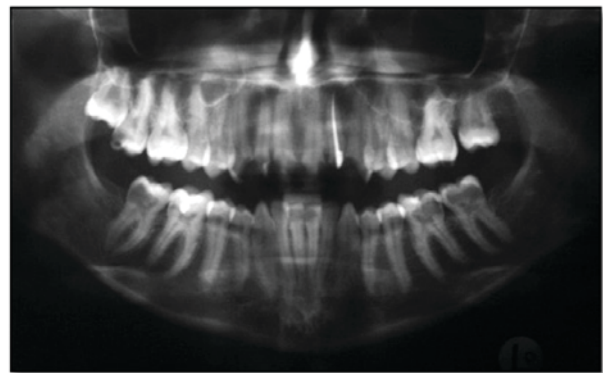


Figure 5. Panoramic radiograph of the patient.

were made for the fabrication of study models. The patient was strongly encouraged to seek professional assistance to halt her methamphetamine abuse.

Treatment

Following periodontal therapy, the following three different dental treatment plan options were offered to the patient for consideration:

1. Porcelain fused to metal crowns for teeth #2, 6–11, 18, 19, and 31 after the completion of endodontic treatment and post-cores. Also, composite restorations for teeth #5, 12, 14,

- 20, 21, 27–30.
2. Extraction of teeth #2, 6–11, 18, 19, 31; implants and implant-supported fixed partial dentures to replace the same teeth. Composite restorations were proposed for teeth #5, 12, 14, 20, 21, 27–30.
 3. Composite restorations for teeth #5, 12, 14, 20, 21, 27–30 after the extraction of teeth #2, 6–11, 18, 19, 31. Placement of maxillary and mandibular conventional removable partial dentures following soft tissue healing.

The patient chose not to have endodontic treatment and selected the second treatment option. Although she was scheduled for the initial periodontal treatment the following week, she failed to appear for her appointment. After six months without contact, the patient returned to the clinic and stated she could not afford the second option offered previously and wanted to pursue the third treatment option, based on a lower cost. Treatment was scheduled in two weeks, but, not surprisingly, she again failed to show up for her appointment. Four months later (10 months after her initial visit), the patient returned and stated she could not afford the third option either. One of her friends (a methamphetamine user) had just received maxillary and mandibular complete dentures, so she wanted to pursue this alternative after the extraction of all existing teeth, which was the cheapest treatment option. The disadvantages of complete removable dentures were then explained to the patient.

An appointment was scheduled for the extractions, but the patient failed to show up again. Sixteen months have passed since the patient's initial visit and she still has chosen not to receive any dental treatment in the present clinic setting.

Discussion

The abuse of methamphetamine is currently a serious problem in the United States due to its widespread appeal, ease of manufacture, and low cost compared to other stimulant drugs. The dental literature has already included a few reports on methamphetamine abuse.^{22–27} These reports suggest the signs of methamphetamine users are as follows:

- Malnourishment
- History of weight loss
- A faint appearance

- Sores on the body and face
- Hyperactivity
- Irritability
- Rapid development of buccal and cervical caries
- Bruxism

The following are suggested modifications for the dental management of methamphetamine users:²³

- Delay all elective dental therapy during active drug use.
- Avoid the prescription of opioid analgesics.
- Avoid the use of local anesthetic with epinephrine.
- Avoid carbohydrate-rich carbonated beverages.
- Use fluoride supplementation.
- Recommend the use of sugarless gum (to increase saliva flow).

Morio et al.²⁴ conducted a comparative study that included 18 adult methamphetamine users and 18 age- and sex-matched control subjects (nonusers) who completed retrospective questionnaires concerning meal patterns, food group intakes, beverage habits, oral hygiene behaviors, smoking behaviors, and drug use. The investigators then performed oral examinations to identify the number of remaining teeth, the number of teeth with obvious decay, and the presence of visible plaque. They found methamphetamine users were more likely to snack without eating defined meals, consume regular soda pop (carbonated beverage with sugar), never brush their teeth, and smoke than the nonusers. Methamphetamine users had more visible plaque; fewer molars; and more decay on anterior teeth, premolars, and molars than did nonusers. They concluded methamphetamine users have more gross caries than do nonusers.

Although only a few reports are available in the dental literature,^{22–24} it would appear that Morales²⁵ reported the only case of “meth mouth” after dental treatment was completed for a 22-year-old man with a history of methamphetamine use.

Summary

Current thinking on the importance of methamphetamine abuse was summarized in this article. Clinical guidelines have been proposed and intraoral pictures and the panoramic radiograph of a methamphetamine user presented

to help clinicians recognize and manage dental patients with a history of methamphetamine abuse. The patient's medical and dental histories along with radiographic and clinical findings lead to a diagnosis of "meth mouth." Although three different dental treatment modalities (either conventional or implant-supported) had been offered to the patient since August 2007, the patient has yet to initiate any treatment.

Clinical Significance

This clinical case showing oral manifestations of meth mouth was presented to help dental practitioners recognize and manage patients who may be abusing methamphetamines. Dental practitioners also may be skeptical about the reliability of appointment keeping by these patients, as they frequently miss their appointments without reasonable justification.

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About the Author

Ilser Turkyilmaz, DDS, PhD



Dr. Turkyilmaz is an Assistant Professor in the Division of Implant Prosthodontics of the Department of Prosthodontics at the University of Texas Health Science Center San Antonio School of Dentistry in San Antonio, TX, USA. He received his dental degree in 1998 and his doctorate in 2004 from the Faculty of Dentistry at Hacettepe University in Ankara, Turkey. He also completed a prosthodontic implant fellowship at the Ohio State University in Columbus, OH, USA in 2007 and 2008. He has been doing both clinical and *in vitro* research with dental implants for the past ten years.

e-mail: turkyilmaz@uthscsa.edu