Journal of the Formosan Medical Association (2014) 113, 187–190

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CASE REPORT

Gingival and localized alveolar bone necrosis related to the use of arsenic trioxide paste—Two case reports

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Received 20 January 2010; received in revised form 4 April 2010; accepted 21 July 2010

KEYWORDS
arsenic trioxide paste;
devitalization;
gingival necrosis;
decortication;
root canal treatment

The leakage of arsenic trioxide paste from tooth fillings has been associated with widespread necrosis of the supporting periodontal tissues. This report describes two cases of arsenic trioxide paste-induced gingival and localized alveolar bone necrosis in the mandible, following the use of arsenic trioxide paste as a pulp-devitalized agent. The first case was a 54-year-old female complaining of a painful white patch on the gingival tissue of the left mandibular second molar (tooth #37) after treatment by a private dentist. She underwent completely debridement of all necrotic soft tissue with physical saline irrigation. The gingival tissue was gradually replaced with vascular tissue and completely healed after 7 weeks. The second case was a 30-year-old female complaining of severe pain and continuous gingival bleeding from the right maxillary first bicuspid (tooth #14) following treatment by a private dentist. She finally accepted debridement of the sequestrum and necrotic alveolar bone with decortication to induce active bleeding. A partial thickness gingival flap was made to cover the wound. Four weeks later, the supporting tissues had completely healed. Arsenic trioxide paste is a cytotoxic agent and may cause harmful adverse effects on adjacent periodontium and supporting hard tissue if leakage occurs, or it is used carelessly. There is no indication for the use of arsenic trioxide paste in modern dental practice.

Introduction

The use of arsenic trioxide in dental treatment was first advocated by Haly Abbas in the year of 1492.[1] It was used to

Conflicts of interest: The authors have no conflicts of interest relevant to this article.

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0929-6646/$ - see front matter
http://dx.doi.org/10.1016/j.jfma.2012.07.023

devitalize inflamed pulps, a procedure claimed to be painless, and was widespread during the years before unreliable anesthetization.[2,3] The utilization of arsenic trioxide (arsenic anhydride) paste during root canal treatment gives immediate pain relief, that led to its imprudent use not only for pulp devitalization, but also for the management of some uncertain discomfort such as dentin hypersensitivity, or pulpotomy of the deciduous tooth.[1] In cases of acute symptomatic pulpitis, particularly in the mandibular molar, where profound anesthesia was previously difficult to achieve because of technical or anatomical problems, some dental clinicians used toxic preparations such as paraformaldehyde, cresol or arsenic paste to devitalize the inflamed painful pulp.[4] Although effective, the potential for leakage of those preparations is unsafe in the palliative treatment of dental pain. The continuous application of "devitalizing pastes" gradually declined because of improvements in local anesthesia techniques.[5–9]

This report describes two cases in whom arsenical pulp devitalization was associated with significant gingival injury, and adjacent alveolar bone necrosis. The leakage of arsenic trioxide paste from an ill-fitting temporary restoration needs to be highlighted and emphasized.

Case reports

Case 1

A 54-year-old female visited the dental department asking for advice and complained about a painful white patch that was gradually getting larger on her lower left back gum. Her personal history confirmed that she accepted dental treatment in a local dental clinic on her lower left second molar because of deep decay. The dental practitioner had applied a "topical medication" and dressed tooth #37 with an unknown paste during root canal treatment, because of unsuccessful local anesthesia. Approximately 3 days later, a white patch developed and continued to increase in size whilst the gum began to feel tender. She called the private dentist, but was told to take some analgesic with anti-inflammatory drugs. However, the patient's complaints did not resolve. The patient came to our dental department asking for further evaluation and management. Clinical examination revealed a white, crater-like lesion about 1.0×1.5 cm^2 in size, located on the interdental gingiva between the mandibular left first and second molars (tooth #36 and #37) (Fig. 1). The underlying alveolar bone was exposed and the gingival tissue was grayish-white in color and surrounded with reddish, blunt, rolled-liked soft tissue. The patient suffered severe pain during chewing and palpation. Furthermore, no probing bleeding from the exposed bone was noted. Marginal gingival recession of tooth #36 and tooth #35 was also found. The mesio-occlusal cavity of tooth #37 was filled with white color temporary filling material, but was not intact. After removal of the temporary filling, a piece of cotton pellet saturated with black arsenic-like paste was packed inside and the mesio-gingival floor of the cavity was exposed. A periapical radiograph revealed incomplete root canal treatment of tooth #37, whilst subgingival root decay beneath the distal

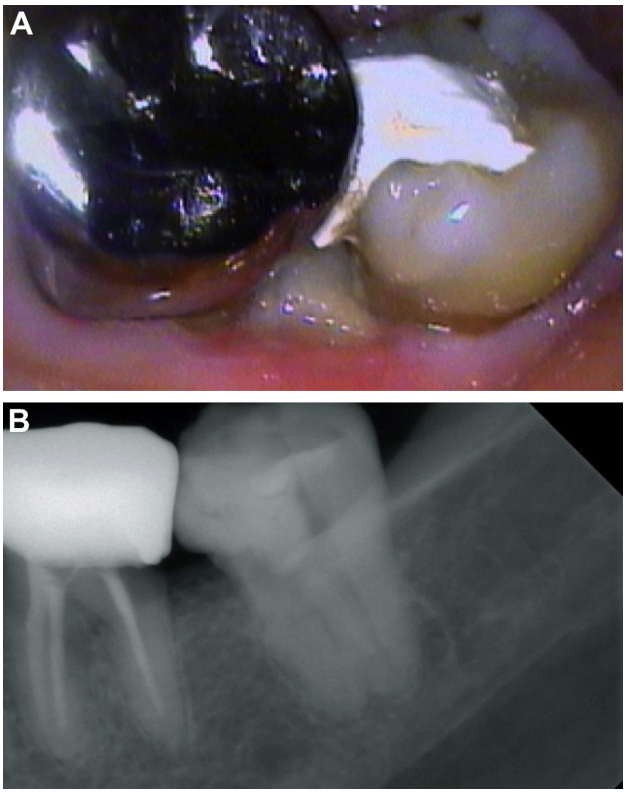

Figure 1 (A) Gingival necrosis with a white, crater-like lesion at the interdental papilla between teeth #36 and #37; and (B) X-ray reveals angular bone loss.

crown margin of tooth #36 was also noted. A periradicular lesion was also suspected. Previous root canal treatment with chronic apical periodontitis of tooth #37 was diagnosed. Medical and family history did not contribute. Further management included the debridement of all necrotic soft tissue and copious irrigation with physical saline after 2.0% xylocaine local anesthesia. Oral amoxicillin (500 mg) and 200 mg metronidazole were given every 8 hours for 7 days. Additionally, the patient was prescribed 50 mg Voren as an analgesic and 0.12% chlorhexidine gluconate as a mouthwash twice a day for 7 days. The patient was recalled after 1 week to evaluate tissue healing. Two weeks later, secondary tissue healing of the interdental region was observed and the superficial necrotic bone was gradually replaced with vascular tissue. The gingiva tissue was completely healed after 7 weeks (Fig. 2). During this period, root canal treatment of the C-shaped tooth #37 was completed under rubber dam protection.

Case 2

A 30-year-old woman first visited our dental department complaining of severe pain and continuous gingival bleeding from her right maxillary first bicuspid (tooth #14) following root canal treatment by a private dentist 2 weeks earlier. Clinical examination revealed a subgingival cavity and a marked area of necrosis of the interdental papilla at the mesial surface of tooth #14. The palatal mucosa was also