Purpose
The management of trauma in the permanent dentition can present a significant challenge to the dental practitioner. Proper medical and dental histories, a thorough clinical examination, as well as a detailed history of the dental trauma, will assist the dental provider in assessing orofacial injuries and are instrumental in formulating a proper diagnosis. A common sequelae to dental trauma is pulp canal obliteration, also referred to as calcific metamorphosis (CM). The purpose of this Clinical Update is to review the information necessary for the proper diagnosis and clinical management of teeth with CM.

Etiology and incidence
CM is defined as a pulpal response to trauma that is characterized by rapid deposition of hard tissue within the root canal space (1). The clinical picture of CM has been described as a tooth that is darker in hue than the adjacent teeth, and exhibits a dark yellow color because of a decrease in translucency from a greater thickness of dentin under the enamel (2). CM is seen most frequently in the anterior teeth. An examination of 881 midshipmen entering the United States Naval Academy revealed that 34 of the patients had a total of 41 anterior teeth exhibiting partial or total obliteration of the pulpal spaces, a patient incidence of 3.86% (3).

Clinical management of calcific metamorphosis
Does the tooth need a root canal? In 1965, Patterson and Mitchell (2) felt that a tooth that had signs of calcific metamorphosis due to trauma should be regarded as a potential focus for infection and that root canal therapy should be initiated. However, further research and clinical observation provided the foundation for current guidelines. The Naval Academy study (3) found that over a four year period only 3/41 (7.3%) of teeth with CM developed pulpal necrosis, and as a result the only definitive criterion for endodontic therapy. Pulpal necrosis as evidenced by periradicular pathology or frequently treated unnecessarily with non-surgical root canal treatment. The conditions listed in the form are potential risk factors that may complicate treatment and adversely affect the outcome (10). Teeth with CM fall into the high difficulty category and achieving a predictable outcome will be challenging for even experienced practitioners. Referral to an endodontist is recommended.

Summary
The literature suggests that teeth with calcific metamorphosis are frequently treated unnecessarily with non-surgical root canal therapy. Pulpal necrosis as evidenced by periapical pathology or symptoms, along with esthetic concerns are the definitive criteria for proceeding with endodontic treatment. This article presented information necessary to aid practitioners in the proper diagnosis and clinical management of teeth with CM, including referral guidelines.

The principles addressed in this Clinical Update are illustrated in the diagnostic flowchart that follows.

References

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