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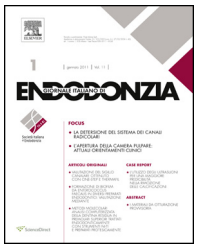

CASE REPORT/CASO CLINICO

Clinical management of horizontal root fractures aided by the use of cone-beam computed tomography

Trattamento clinico-chirurgico di fratture radicolari orizzontali con l'ausilio di tomografia computerizzata a fascio conico

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KEYWORDS
Dental trauma;
Root fracture;
Cone-beam computed tomography;
Diagnosis;
Treatment.

Abstract
Aim: To present a a therapeutic approach in a case series of teeth that suffered some root fracture at different thirds with a follow-up period of 24 months.
Summary: Dental trauma occurs with great frequency to the maxillary incisors, and, sometimes, horizontal root fractures are caused. The classification and severity of horizontal root fractures are based on the location of the fracture line and on the degree of dislocation of the coronal fragment. Diagnosis of horizontal root fractures is based on clinical findings, sensibility tests, and principally in radiographic and cone-beam computed tomography (CBCT) examination. The following cases report describes the diagnosis and treatment of four maxillary central incisors with horizontal root fractures. In three of the cases described, the healing occurred through the interposition of connective tissue where radiographically was possible to observe a radiolucent at the level of the fracture line and the rounding of the fragment angles. In one case, the healing occurred by calcified tissue, which can be seen radiographically in the fracture line, but the

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fragments are in close contact. In addition to a proper treatment plan, the International Association of Dental Traumatology (IADT) stresses the importance of patient compliance with follow-up, and daily care visits for better healing after dental trauma. Knowledge of existing protocols for this type of injury and periodic monitoring of cases has shown the success of the treatment so far.

Key-learning points:

(1) The diagnosis of root fractures requires a detailed examination, both clinical and radiographic.
(2) The IADT developed a guideline in order to propose an effective treatment plan.
(3) The CBCT facilitates the visualization of lines fracture.
(4) An immediate approach after horizontal root fractures comprises reduction, splints and occlusal adjustment.

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PAROLE CHIAVE
Trauma dentale;
Frattura radicolare;
Tomografia computerizzata a fascio Conico;
Diagnosi;
Trattamento.

Riassunto

Obiettivi: Presentare un approccio terapeutico con una serie di casi di denti che hanno subito una frattura radicale a diversi livelli con un periodo di follow-up di 24 mesi.

Riassunto: Il trauma dentale si presenta con una grande frequenza negli incisivi mascellari e, a volte, si possono verificano fratture di radice orizzontale. La classificazione e la gravità delle fratture di radice orizzontale si basano sulla posizione della linea di frattura e sul grado di dislocazione del frammento coronale. La diagnosi delle fratture di radice orizzontale è basata sui riscontri clinici, test di sensibilità e principalmente un esame radiografico intraorale e CBCT. I casi affrontati descrivono la diagnosi e il trattamento di quattro incisivi centrali mascellari con fratture di radice orizzontale. In tre dei casi descritti, la guarigione si è verificata attraverso l'interposizione di tessuto connettivo in cui radiograficamente è stato possibile osservare un radiotrasparenza a livello della linea di frattura e l'arrotondamento degli angoli dei frammenti. In un caso, la guarigione è stata caratterizzata da tessuto calcificato, che può essere visto radiograficamente nella linea di frattura, ma i frammenti sono in stretto contatto. Oltre ad un adeguato piano di trattamento, l'Associazione Internazionale della Traumatologia Dentale (IADT) sottolinea l'importanza delle visite di follow-up e del mantenimento quotidiano per una migliore guarigione dopo traumi dentali. La conoscenza dei protocolli esistenti per questo tipo di lesioni e il monitoraggio periodico dei casi ha mostrato finora un buon successo del trattamento.

Punti chiave di apprendimento:

1.La diagnosi di fratture radice richiede un esame dettagliato, clinico e radiografico.
2.L'Associazione Internazionale della Traumatologia Dentale (IADT) ha sviluppato una linea guida per proporre un efficace piano di trattamento.
3.La CBCT facilita la visualizzazione delle linee di frattura.
4.Un approccio immediato dopo le fratture di radice orizzontale comprende riduzione, splintaggio e regolazione occlusale.

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Introduction

Dental root fractures occur mainly in the anterior area of the maxilla, frequently due to a frontal impact, predominantly as a result of automobile accidents, violence and sporting activities.[1] The incidence of fractures in permanent teeth occurs at a rate of 0.5—7% of all traumatic injuries of teeth.[2] This traumatic event is most observable in the maxillary central and lateral teeth, and rarely in mandibular incisors.[3] The classification and severity of horizontal root fractures are based on the location of the fracture line, i.e., cervical, medium, or apical; and on the degree of dislocation of the coronal fragment.[2]

The clinical management of a root fracture depends on its pulp vitality, dislocation of the fragments, and the location/extent of the fracture line. Root fracture healing that can occur through hard tissue deposition or by the interposition of connective and hard tissue between the fragments is dependent on two conditions: pulp integrity and invasion or no bacteria in the fracture line.[4,5]

The degree of mobility is related to the level of the fracture, but the diagnosis depends on the radiographic examination for differentiation trauma of dislocation. It is convenient to hold two or multiple radiographs with variation in the vertical angle of incidence of the beam[6] or complementation with another dimensional view by using cone-beam computed tomography (CBCT), especially the oro-facial dimension.[7—10]

A series of clinical reports have shown important information regarding long-term survival of teeth with horizontal

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