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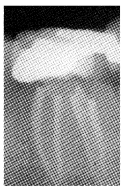

CASE REPORT

Multiple idiopathic apical root resorption: a case report

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Abstract

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Aim To report a rare case of multiple idiopathic apical root resorption in an adult male.

Summary A 27-year-old male with no history of medical or dental disorders was referred by his family dentist for evaluation of extreme root resorption involving the apical region of most of his teeth. A complete haematological investigation was conducted and all the results were within the normal range. Mobility of the teeth was physiologic and no abnormal periodontal pockets were observed. A diagnosis of multiple idiopathic apical root resorption was made.

Key learning points

- Apical root resorption of multiple teeth can be related to no specific aetiology and is known as idiopathic apical root resorption.
- It is mostly seen in young adult males; maxillary teeth are more frequently involved.
- No preventive or therapeutic regimen is known and monitoring accompanied by periodontal maintenance is recommended.

Keywords: idiopathic, multiple resorption, root resorption.

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Introduction

The resorption of permanent teeth was first described by Bates (1856), who considered the cause to be trauma to the periodontal membrane. Root resorption is classified as external and internal, the former being reported more often (Cohen & Burns 2002). Root resorption of permanent teeth has been attributed to a wide variety of causes such as trauma, inflammation, tooth reimplantation, tumours, cysts, occlusal stress, impacted teeth (Shafer *et al.* 1983), orthodontic movement (Copeland & Green 1986), periodontitis (Rodriguez-Pato 2004) and dietary habits (Moody & Muir 1991). Resorption of the roots

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can also be related to endocrine disturbances and systemic conditions such as hyperparathyroidism (Goultschin *et al.* 1982), hypoparathyroidism (Sunde & Hals 1961), hypophosphatemia (Tangney 1979), hyperphosphatemia (Eyring & Eisenberg 1968), Gaucher's disease (Bender & Bender 1996), Paget's disease of bone (Smith 1978), Goltz syndrome (Baxter *et al.* 2000), Papillon–Lefèvre syndrome (Rudiger & Berglundh 1999), anachoresis (Penido *et al.* 1980) and Turner syndrome (Yusof & Ghazali 1989). However, minimal apical resorption may be present in all permanent teeth (Henry & Weinmann 1951). Rarely, resorption of unknown aetiology is encountered (Gibilisco 1985).

Idiopathic external root resorption is the term used when the condition exists without a known aetiology (Belanger & Coke 1985). The condition was first reported in 1930 by Mueller & Rony (1930). It is a rare condition that has been reported in single and multiple teeth. Two types have been observed: apical and cervical (Lydiatt *et al.* 1989, Yusof & Ghazali 1989). The majority of reports involve the apical part of several teeth in young individuals. In apical idiopathic root resorption, the resorption starts apically and progresses coronally causing a gradual shortening and rounding of the roots, whereas the cervical type starts in the cervical region and approaches the pulp (Postlethwaite & Hamilton 1989, Rivera & Walton 1994).

Only nine clearly identified cases of multiple idiopathic apical root resorption have been reported in the literature, all of which were in relatively young individuals aged from 14 to 34 years and all except two were in males.

This paper describes an adult male with multiple idiopathic apical root resorption. No local or systemic cause could be identified. Almost all teeth except the mandibular anterior teeth were involved.

Report

A 27-year-old male was referred to the Endodontic Department of Shiraz University of Medical Sciences, School of Dental Medicine by his family dentist for evaluation of extensive root resorption affecting most teeth. The patient was a truck driver with no history of medical disorders. A family history revealed no early tooth loss in parents or grandparents. His two brothers and three sisters were also examined, and panoramic radiographs revealed no similar condition.

The patient underwent a complete haematological investigation including serum alkaline phosphatase, calcium, phosphorus, sodium, potassium and serum proteins and lipids. All were within normal limits.

Clinical examination revealed normal soft tissues and normal dentition particularly the morphology and size of the crowns. The periodontal condition was normal with no abnormal pocketing. Tooth mobility was within the physiological range. Teeth were tested both with heat and an electric pulp tester. All except teeth 16 and 26 responded. Tooth 26 had a root filling and tooth 16 had a carious lesion with extensive root resorption. Extraction of tooth 16 was recommended but because it was painless and firm, the patient refused. Teeth 36 and 37 were painful and pulpectomy of the teeth was performed as a primary treatment.

The patient's occlusion was also examined but no wear facets or premature contacts were detected and the patient gave no history of bruxism or clenching. He had no history of orthodontic treatment, trauma or any unusual dental, medical or dietary factors.

A panoramic radiograph and tracing (Fig. 1) together with the periapical radiographs (Fig. 2) revealed extensive apical root resorption in all teeth except teeth 18, 23, 31–34, 37 and 41–44. Eighteen teeth had apical root resorption, mostly in the maxilla.

On the basis of the history, clinical examination and radiographic evaluation, a diagnosis of multiple idiopathic apical root resorption was made.

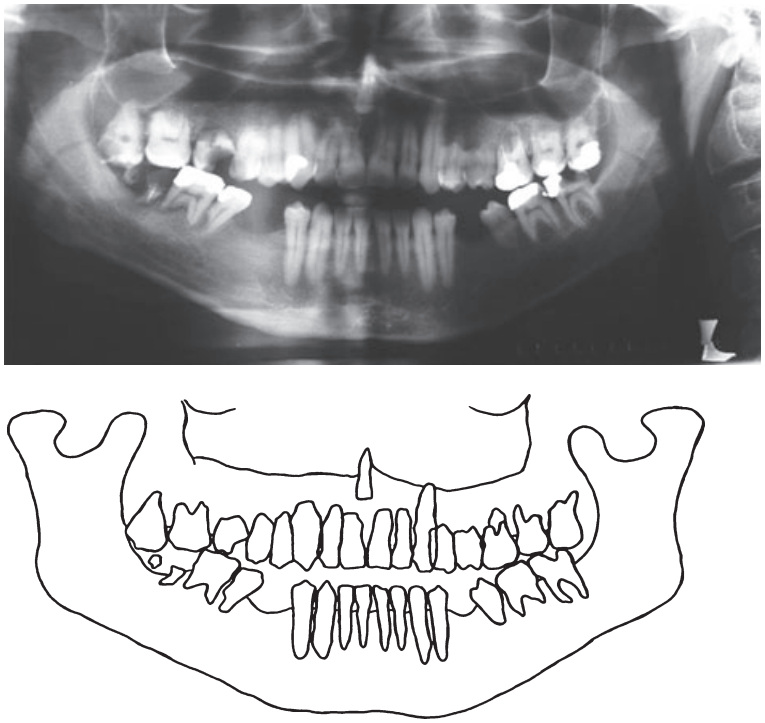

Figure 1 Panoramic radiograph and its related tracing, showing extensive apical root resorption of eighteen teeth.

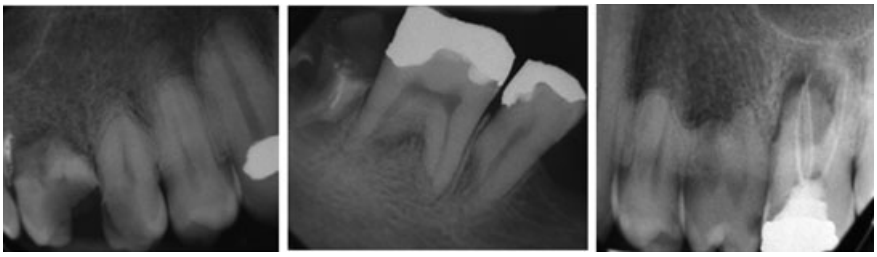

Figure 2 Periapical radiographs showing apical root resorption in vital and non-vital teeth in different regions of the mandible and maxilla.

The patient was given instructions to maintain proper oral hygiene and was scheduled for frequent recall visits in order to prevent periodontal bone loss and further compromise of crown : root ratio.

Discussion

This case is a rare example of multiple idiopathic apical root resorption. Only nine clearly identified cases have been reported since 1970 (Table 1). The average age of the patients has been 23.2 years (ranging from 14 to 34 years) and all except two were male. The average number of teeth involved was 18, the same number as involved in the current case.

Table 1 Case reports of idiopathic apical root resorption

Case report	Gender	Age (years)	No. of teeth affected	Teeth affected	
Soni & La Velle (1970)	M	34	9	-,-,-,-,14,-,-,-	-,-,-,-,-,-,-,-
				48,47,46,45,-,-,-,-	-,-,-,-,35,36,37,38
Cowie & Wright (1981)	M	27	9	-,17,16,15,14,-,-,-	-,-,-,24,25,26,27,-
				-,-,-,-,-,-,-,-	-,-,-,-,-,-,37,-
Belanger & Coke (1985)	M	14	26	-,17,16,15,14,13,-,11	-,22,23,24,25,26,-,28
				-,47,46,45,44,43,42,41	31,32,33,34,35,36,37,-
Pankhurst *et al.* (1988)	M	30	13	-,17,16,15,-,-,12,-	-,22,-,-,25,26,-,28
				48,47,46,-,-,-,-,-	-,-,-,-,-,-,37,38
Postlethwaite & Hamilton (1989)	M	14	20	-,-,-,15,14,13,12,11	21,22,23,24,25,-,-,-
				-,-,-,45,44,43,42,41	31,32,33,34,35,-,-,-
Counts & Widlak (1993)	M	23	18	-,17,16,15,14,13,12,11	21,22,23,-,25,26,-,-
				-,-,-,45,44,-,-,-	-,-,-,34,35,36,37,-
Rivera & Walton (1994)	M	24	21	-,17,16,15,14,13,12,11	21,22,23,24,25,26,-,-
				-,47,46,45,44,-,-,-	-,-,-,34,35,36,37,-
Di Domizio *et al.* (2000)	F	26	15	-,-,-,-,-,13,12,11	21,22,23,-,25,-,-,-
				-,47,-,-,44,-,-,41	31,32,-,34,35,-,37,-
Schätzle *et al.* (2005)	F	17	28	-,17,16,15,14,13,12,11	21,22,23,24,25,26,27,-
				-,47,46,45,44,43,42,41	31,32,33,34,35,36,37,-
Moazami and Karami (present case)	M	27	18	-,17,16,15,14,13,12,11	21,22,-,24,25,26,27,28
				-,-,46,45,-,-,-,-	-,-,-,-,35,36,-,-

-, No tooth or resorption.

The mandibular anterior teeth were not involved, and this is similar to five cases listed in Table 1. This might be due to a lower blood supply to the anterior segment of the mandible when compared with the maxilla. In all cases, except the one reported by Soni & La Velle (1970), the maxillary teeth were more involved than the mandibular teeth. Massler & Perreault (1954) reported that the teeth most commonly involved were the maxillary premolars with the mandibular incisors and molars exhibiting the least resorption. In the present case the maxillary premolars had the most extensive resorption.

Idiopathic apical root resorption does not seem to be mediated from the pulp space. It is suspected that triggering factors exist for osteoblastic and odontoblastic activity producing root resorption (Rivera & Walton 1994). Special mechanisms in the periodontal ligament exist to prevent mineralization of the periodontal ligament and these periodontal ligament cells produce paracrine factors that inhibit mineralized tissue resorption and are capable of regulating bone and cementum formation (Beertsen *et al.* 1997, McCulloch *et al.* 2000). Schätzle *et al.* (2005) performed an immediate histological analysis on extracted teeth in one case, and observed cementicles and an unusually high number of mineralization foci associated with acellular extrinsic fibre cementum that had covered the cervical region of the root, suggesting that there had been a disturbance in the regulation of mineralization within the periodontal ligament.

Because this phenomenon is not mediated from within the pulp space, treatment methods to arrest this type of apical resorption by interceptive endodontic procedures including pulp removal and placement of calcium hydroxide or any other intracanal medicament and obturation are not indicated.

There is no preventive or therapeutic regimen for this type of root resorption and treatment usually consists of observation and finally extraction of teeth.

Further studies are needed to identify the specific cellular mechanism responsible for the condition and to determine therapeutic measures.

Conclusion

The present case has no known aetiology and is considered to be multiple idiopathic apical root resorption. The condition is seen mostly in young adult males and maxillary teeth are more frequently involved. There is no known preventive or therapeutic regimen for this condition, and monitoring accompanied by periodontal maintenance is recommended.

Disclaimer

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