

## Review

### Diagnostic Dilemma of Multiple Idiopathic Apical Root Resorptions: A Case Report and Review.

DR. Pinhaj A Sherashiya, MDS; [1] DR. Sudhakar Reddy, MDS; [2] DR. Yogesh T L, MDS; [3] Dr. Vijay Apparaju, MDS. [4]



1, Board In-charge, Adarsh Oncopath Lab, Palanpur, Gujarat- 385001, INDIA

2, Senior Implantologist, Apollo Hospital, Bannerghatta road, Bengaluru -32, Karnataka, INDIA

3, Assistant Professor, Department of Oral& Maxillofacial Pathology, Sri Rajiv Gandhi College of Dental Sciences and Hospital, Bengaluru -56, Karnataka, INDIA

4, Periodontist, Private consultant, Bengaluru -54, Karnataka, INDIA

Correspondence: Dr Pinhaj A Sherashiya, MDS; Adarsh Oncopath Lab, Near Gathamam Gate, Palanpur, Gujarat- 385001, INDIA. [hi-pinhaz@gmail.com](mailto:hi-pinhaz@gmail.com)

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## ABSTRACT

**Background and Setting:** The 25 year old male patient, who had reported to the Department of Oral and Maxillofacial Pathology, with a rare case of multiple idiopathic root resorptions, has been presented here. He presented with a chief complaint of mobility of teeth in upper back region of the mouth for which he could not ascribe any particular reason. On clinical examination, the patient's chief complaint was confirmed. Grade II mobility was observed in 17, 26 regions. Combining the data received such as the chief complaint, clinical findings and previous history, a provisional diagnosis of idiopathic root resorption was made. The patient was advised to undergo an Orthopantomogram and Pelvic radiograph and biochemical analysis to reiterate the provisional diagnosis.

Idiopathic root resorption of the permanent dentition is unusual and is encountered during a routine dental examination. The precise etiology of the condition is unknown, but the proposed, well recognized causes of apical root resorption in permanent teeth include trauma, periapical or periodontal inflammation, tumors, cysts, occlusal stress, impacted teeth, systemic conditions, endocrine imbalances and dietary habits. A diagnosis of 'Idiopathic root resorption' is given, if it fails to fulfil the salient features of the above mentioned lesions. Very few cases of this rare entity have been reported in the literature.

## INTRODUCTION

Idiopathic external root resorption is a rare condition observed in either a single or in multiple teeth. Pathological root resorption is related to several local and systemic factors. [1]

Local factors are:

- trauma,
- periapical inflammation,
- re- implantation of avulsed teeth,
- tumors, cysts and tooth impactions [2]
- Systemic factors contributing multiple external root resorptions include: endocrine disturbances such as hypophosphatasia, hyperparathyroidism and hypothyroidism. [3]
- genetic predisposition is a probable factor for root resorption but no distinct mode of inheritance has been identified. [1, 4]

Those cases of multiple root resorption for which a causative factor cannot be determined are termed 'Idiopathic'. It should be differentiated from the pathologic type of root resorption.

Two types of idiopathic root resorption have been observed,

- apical: starts apically and progresses coronally causing a gradual shortening and rounding of the remaining root [4,5]
- cervical: starts in the cervical area of the teeth and progresses toward the pulp.[4,5]

#### CASE REPORT

A 25 year old male patient reported to Department of Oral and Maxillofacial Surgery with a chief complaint of mobility of teeth in upper back region of the mouth. Six months prior, he had a similar complaint of teeth mobility for which he underwent extraction at a private dental clinic. Clinical examination revealed the mobility in teeth. Grade II mobility was observed in relation to 17, 26 regions. Surprisingly, the patient's overall oral hygiene and the periodontal status was good.



**FIGURE 1:** Extra oral view shows a symmetrical face

General physical examination of the patient indicated that he was medically fit and well oriented with time and place. Based on chief complaint, clinical findings and the previous history, and negative findings of the general physical examination, a provisional diagnosis of 'Idiopathic root resorption' was given. Patient was advised to take an Orthopantomogram, a pelvic radiograph and biochemical analysis to rule out systemic diseases.



**FIGURE 2:** OPG revealed apical root resorption in relation to multiple teeth such as 12, 17, 22, 26, 37, and 47

OPG revealed apical root resorption in relation to multiple teeth such as 12, 17, 22, 26, 37, 47 with missing 16, 36. However 17 and 26 showed more than 2/3rd root resorption. Pelvic radiograph showed normal anatomy without any bony lesion or deformity, as per the reports of the general radiologist. Biochemical analysis showed serum alkaline phosphate level within normal limits- 153 IU/L with packed cell volume of 44% and erythrocyte sedimentation rate of 20mm/hr. Based on the clinical examination and the above investigations, a confirmatory diagnosis of multiple idiopathic root resorption was made. The decision to extract 27 for histopathological investigation was made.

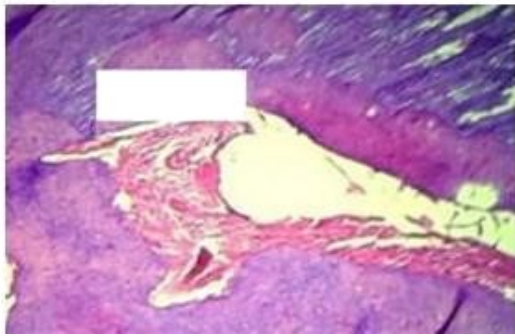
Histopathological examination of decalcified tooth section revealed osteodentin formation with areas of dentine degeneration and fibrosis of pulp. Osteodentin showed mixed eosinophilic, basophilic appearance with odontoblast entrapped in it. The pulpal tissue showed fibrosis with scanty amount of inflammatory cells infiltration; mainly lymphocytes and macrophages



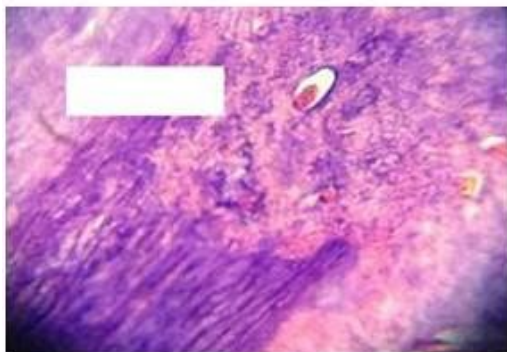
**FIGURE 3:** Radiograph of pelvis revealed a normal bony anatomy without any osseous deformity.



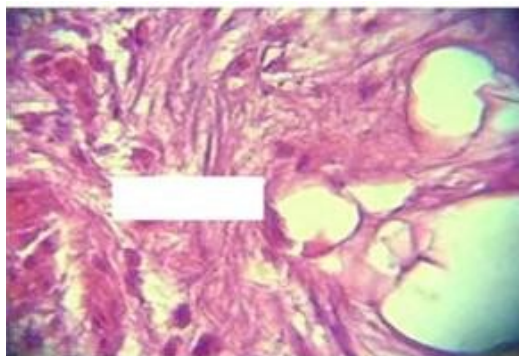
**FIGURE 4:** Grossing specimen of extracted teeth of 17.



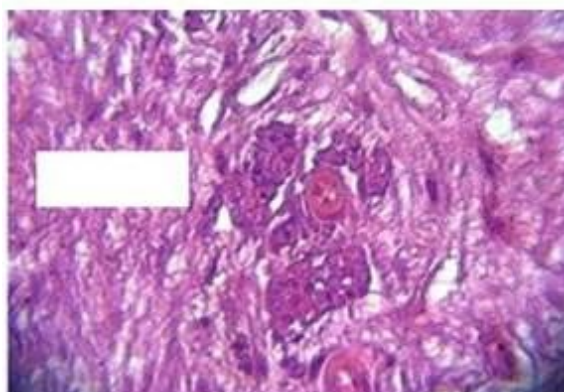
**FIGURE 5:** 10 x Hematoxylin and eosin stained section of the decalcified tooth section shows osteodentin formation with fibrosed pulp.



**FIGURE 6:** 40 x Hematoxylin and eosin stained section of the decalcified tooth section shows osteodentin with entrapped odontoblast.



**FIGURE 7:** 40 x Hematoxylin and eosin stained decalcified tooth section shows fibrosed pulp tissue with scanty inflammatory cells infiltrate.



**FIGURE 8:** 40x Hematoxylin and eosin stained decalcified tooth section shows areas of multinucleated giant cell infiltration

and few areas of pulpal tissue also showed the presence of multinucleated giant cells. Based upon clinical, radiographic and histopathological findings the final diagnosis of Idiopathic multiple root resorption was made.

### DISCUSSION

The diagnosis of the present case was arrived at by exclusion of all local or systemic factors and the confirmatory histopathological findings. The most striking histological finding was osteodentin formation and fibrosed pulp with areas of multinucleated giant cells which are rarely encountered in the idiopathic root resorption cases. Root resorption is caused by activity of multinucleated osteoclastic cells in the periodontal ligament. Normally there is a dynamic balance between the osteoblastic and osteoclastic activity that maintains the physiological state of the tooth root and bone. An imbalance may result in external root resorption whereby the cementum and dentin is removed. External root resorption can occur anywhere along the root surface, in contrast to internal root resorption which starts from an area adjacent to the pulpal tissue. Various etiological factors for root resorption have been identified in literature. Physiological resorption occurs in primary teeth preceding eruption of the permanent successor. This is easily recognized from a radiograph where the affected roots are closely associated with crowns of the permanent teeth.

Local factors are like excessive orthodontic force may result in root resorption which may result in apical blunting. Extreme cases may result in complete loss of the root structure. Usually the tooth remains vital unless the resorption is very severe.

Root resorption also arises from excessive occlusal force where there is a severe occlusal trauma. This occurs after the periodontium has lost its capacity to withstand the forces, resulting in alveolar bone loss and in some cases root resorption.

A high probability of root resorption occurs after reimplantation of avulsed teeth.

Various systemic conditions have been implicated for root resorption, including hypoparathyroidism, calcinosis, and hyperparathyroidism, Gaucher's disease, and Turner syndrome, Paget's disease, and radiation therapy.



In young patients undergoing radiation therapy, it is most likely that the shortened root results from arrested root development and premature closure of the apex. [10]

Idiopathic resorption can occur without local or systemic etiological factors. It may affect one or several teeth. There are two types of idiopathic root resorption; apical and cervical.

- In the apical type, there is a gradual shortening of the root whereby the apex becomes rounded. The resorptive process may arrest spontaneously.

- In contrast, cervical resorption starts in the cervical area of the teeth and progresses toward the pulp. Cases of multiple idiopathic root resorption involving all or most of the permanent teeth have been reported in the literature. [10, 14]

The idiopathic apical root resorption does not seem to be mediated by, or have its source internally, from the pulp space. Tooth and bone resorption occurs through aberrant osteoclastic or odontoclastic activity in the periodontal ligament. Therefore, interceptive endodontic procedures including pulp removal and placement of calcium hydroxide or obturation with gutta-percha fail to address the target problem. [2,15] Although, some potential factors (dietary habits and changes in the oral flora) have been suggested for idiopathic root resorptions, many have yet to be discovered. Thus, the future for the management or preventive therapies for idiopathic root resorption will depend on the identification of the specific cellular mechanisms that cause this disease. [2, 10]

## CONCLUSION

At present, there is no preventive or therapeutic regimen for the type of root resorption observed in this case report. Treatment usually consists of the extraction of teeth with advanced lesions. Careful treatment planning and current understanding of idiopathic tooth resorption is important, because there is a need to deal with not only the immediate, but also the long-term adverse implications. Hence, multidisciplinary treatment planning that takes place on account of established and emerging techniques needs to be practiced. Patient with idiopathic tooth resorption may not

only have functional problems but also psychological distress that requires early diagnosis and proper evaluation to improve oral health.

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