

External Apical Root Resorption – An Unusual Case Report

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Abstract: External root resorption is very infrequent in permanent dentition. It is multifactorial, may occur due to local as well as systemic factors. Contributing local factors are trauma, orthodontic force, periodontitis and systemic factors like hyperparathyroidism, hyperphosphatemia, Paget's disease etc. Here presenting a case of external root resorption with different patterns occurring in molars in patient having hypothyroidism and faulty prosthesis.

Key words: root resorption, hypothyroidism, periapical inflammation

I. Introduction

Root resorption is gradual reduction in some part of the root. It may be a physiologic or pathologic. Root resorption in case of deciduous teeth is considered as physiologic¹ and in case of permanent teeth it is pathologic. Pathologic root resorption can be either internal or external in nature.² Internal root resorption (IRR) is usually due to inflammation of the pulp and external root resorption (ERR) is due to periapical inflammation, orthodontic treatment, pressure from the impacted or supernumerary teeth, cyst and tumor.³

ERR is seen in cervical region or in the apical region. Reasons for these locations of resorption are different from each other.

Root resorption is different from the bone resorption. Bone resorption takes place quite commonly and remodeling occurs due to presence of osteoblasts and osteoclasts. This process is seen throughout the life. But it is not same with the root resorption. Root resorption is also not commonly seen. Reason for that may be the presence of protective pre-cementum around the root. In pathologies where this pre-cementum gets affected, there root resorption is seen.

External resorption leads to loss of cementum, dentin and bone. It may take place in vital as well as in non-vital teeth and it is identified during routine radiographic or clinical examination as the majority of cases are asymptomatic.

The consequences of root resorption range from slight tooth mobility due to small amounts of root loss to complete tooth loss from excessive amounts of resorption. Radiographically the resorption may appear as either an apical root blunting, lateral root resorption or in rare cases excessive root loss. So, here reporting an unusual case in which root resorption is seen in two teeth but the pattern of resorption is different and the cause for the resorption is also unusual.

II. Case Report

63 year old female patient came with complaint of difficulty in chewing due to mobile bridge in upper right back and lower left back teeth region since 2 months. Patient gave history of extraction and fixed prosthesis in maxillary right back region and endodontic treatment followed by crown for mandibular left first molar and restoration followed by crown for mandibular left second molar 8 years back. Medical history revealed patient has hypothyroidism and hypertension and on medication for the same since 5 years. No history of trauma or swelling noted.

On intraoral examination there was fixed partial denture for 15, 16, 17 with acrylic facing and nickel chromium crown with 37 which were mobile and there was generalized periodontal pockets. All the crowns were over contoured and partly resting on gingiva. There were no occlusal interferences in centric and eccentric movements. Horizontal crown fracture was seen with 36 which was endodontically treated. 35 was missing.

As part of routine examination, panoramic radiograph and intraoral periapical radiographs were taken. Panoramic radiograph revealed external root resorption of distal root with 37 and external root resorption of all three roots with remodeling of bone in 17 (Fig 1), root piece of 38, 36 and missing 16 and 35. The pattern of root resorption in 17 and 37 was different. In 17 the resorption was seen till cervical 3rd region with bone remodeling and end of the roots appear blunted (Fig 2) and in 37, distal root was completely resorbed till the cervical region. So it is suspected that root resorption may be due to over-contoured or faulty prosthesis that has

led to formation of periodontal pocket leading to external root resorption. Based on these findings the diagnosis of inflammatory external root resorption was given.

Treatment plan

There was grade III mobility in 37 and 15, 16, 17 bridge which has poor prognosis, so extraction of 17 and 37 was planned. Extraction of 37 and root piece of 38 was done. Extracted tooth (Fig 3) showed resorption of the distal root and the end of that root was blunted.

III. Discussion

External root resorption occurs on the outer surface of the root, and there are several causes for the same. External inflammatory root resorption is most common among several types of external root resorption. It may arise as a sequel of traumatic injury, orthodontic tooth movement, or chronic infection of the pulp or periodontal structures.⁴ External inflammatory root resorption is considered a major resorptive condition without symptoms.

Severe traumatic injury involving diffuse damage to the root surface leads to an abnormal attachment after healing. Initially there is inflammatory response resulting in area of root surface devoid of cementum. In this area the precursor of bone cells repopulate and by that the bone comes directly in contact with root. This phenomenon is termed dentoalveolar ankylosis.⁵ Then the root is resorbed by the osteoclasts and bone formation takes place in that region since bone resorption and formation takes place throughout the life. This formation of bone in the region of root resorption is termed as osseous replacement.

In case of pulpal inflammation or when pulp is necrotic, the bacterial toxins can pass through the dentinal tubules and stimulate an inflammatory response in the corresponding periodontal ligament.⁶ Because of this the protective quality cemental covering will be lost. The result is resorption of the root and bone.

In the present case the resorption of the root was due to the over-counterbalanced crowns placed on the teeth. Marginal integrity of these crowns was poor. Causes for root resorption may be periodontal inflammation due to over-counterbalanced crown which might have led to the inflammation around the root leading to the loss of the protective cemental covering and resorption of root and bone with osseous replacement. In the same patient other molar also had crown after endodontic treatment. The crown of which was dislodged with fracture of tooth and only root stumps were remaining. Root of that tooth does not show any signs resorption. This suggests that there might be periapical infection along with periodontal inflammation in relation to teeth with root resorption. The teeth treated with the endodontic therapy have less chances of root resorption. If there was only periodontal inflammation, resorption will be first seen in the cervical region. But in present case root resorption was seen till cervical third of the tooth. In left mandibular region, the pattern of the resorption is very unusual because, only one root ie distal root was resorbed till cervical third and mesial root shows minimal amount of root resorption. In right mandibular first molar too has minimal resorption in apical region. Root resorption was seen only with molars it shows that along with over counterbalanced crowns occlusal force might be contributing factor.

Thyroid hormone acts directly on bone remodeling by stimulating osteoblast-osteoclast coupling. It has also been recorded that thyroid hormone acts in bone resorption occurring in the periodontal region and in the apical roots.⁷ Reports have shown that administration of low thyroxine doses decrease the extent of force-induced root resorption in both humans and rats.⁷ In the present case the patient had history of hypothyroidism and on medication for the same, still root resorption was seen. Unusual fact is that pattern of root resorption was different in different areas. This needs further investigations to know the exact cause for different pattern of root resorption.

IV. Conclusion

Root resorption is common pathology and cannot be identified in early stages because of its asymptomatic nature. But if diagnosed in early stage, the prognosis will be good. For early detection, periodic radiographic examination should be done. To prevent the root resorption by local factors, faulty prosthesis should be replaced as early as possible and asking patient to maintain fastidious oral hygiene. Thorough medical history plays important role because hormones act on the bone remodeling as well as root resorption. In the present case in spite of supplementation thyroid hormone there was severe root resorption. This needs further investigations to know the exact cause for such root resorptions.

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Figure legends

Figure 1: panoramic radiograph showing root resorption with 17, 37, 46.

Figure 2: intra oral periapical radiograph showing root resorption in 17, with osseous replacement.

Figure 3: showing extracted tooth fragments of 36, 37, 38.



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Figure 2: intra oral periapical radiograph showing root resorption in 17, with osseous replacement.



Figure 3: showing extracted tooth fragments of 36, 37, 38.