



## CONSERVATIVE MANAGEMENT OF INFLAMMATORY ROOT RESORPTION WITH PERFORATION-A CASE REPORT

<b>Dr. Moksha Nayak</b>	MDS, PhD -Professor, Department of Conservative Dentistry and Endodontics, KVG Dental College and Hospital, Sullia, Dakshina Kannada, Karnataka, India.
<b>Dr Priyanka RI*</b>	Post graduate student, Department of conservative dentistry and endodontics, KVG Dental College and Hospital, Sullia, Dakshina Kannada, Karnataka, India, 574327 *Corresponding Author
<b>Dr. Vidhya Shenoy</b>	Post graduate student, Department of conservative dentistry and endodontics, KVG Dental College and Hospital, Sullia, Dakshina Kannada, Karnataka, India, 574327.

**ABSTRACT** Inflammatory resorption occurs when the predentin or preceementum becomes mineralized or, if the preceementum is mechanically damaged or scraped off. It becomes progressive when, in addition to a denuded area of an internal or external root surface, there is additional long-lasting stimulation of the resorbing cells, such as sharp edges, increased pressure in the tissue, infection, or certain systemic diseases. In many instances advanced diagnostic methods such as CBCT may be required for a definitive diagnosis. The prognosis for treatment of small lesions of internal root resorption is very good. However, if the tooth structure is greatly weakened along with perforation, the prognosis is poor. This case report presents a successful management of a case of internal resorption with root perforation which was repaired using biodentine as a repair material.

**KEYWORDS :** Inflammatory root resorption, Root perforation, Biodentine, CBCT

### INTRODUCTION

Inflammatory resorption occurs when the predentin or preceementum becomes mineralized or, if the preceementum is mechanically damaged or scraped off. When seen on the walls of the root canal, it is termed internal resorption which may be transient or progressive.<sup>1</sup> Inflammatory resorption becomes progressive when, in addition to a denuded area of an internal or external root surface, there is additional long-lasting stimulation of the resorbing cells, such as sharp edges, increased pressure in the tissue, infection, or certain systemic diseases.<sup>1</sup>

The American Association of Endodontists Glossary of Endodontic Terms defines perforations as mechanical or pathological communications between the root canal system and the external tooth surface.<sup>2</sup> Trauma, caries and restorative procedures have been suggested to be contributing factors.

For internal resorption to occur and progress, vital pulp tissue is mandatory. Therefore nonsurgical root canal therapy is the treatment of choice to arrest the destruction process.<sup>3</sup> Prognosis of the tooth depends on various factors such as, the location, the duration for which the perforation was open to contamination, attainment of complete seal of the perforation and accessibility of the main canal.

The present case reported with a perforating progressive inflammatory resorptive lesion in a root canal therapy attempted teeth. Both surgical and nonsurgical techniques for resolving the defect was considered for management of this case.

### CASE REPORT

A 42 year old female patient reported to the department with pain in the right upper front tooth region. Case history, clinical and radiographic examination suggested a large internal resorptive lesion with perforation in the maxillary right lateral incisor.

Treatment of internal resorption is challenging because of the irregular confines of the resorption cavity, presence of granulation tissue, and inaccessibility to direct mechanical instrumentation.<sup>4</sup> Successful treatment relies on the complete removal or inactivation of a resorptive tissue as well as debridement and obliteration of the root canal system.<sup>5</sup> The gold standard treatment consists of debridement and obturation of pulp space, sealing of the external communication and restoration of normal function of tooth through nonsurgical or surgical methods.<sup>6</sup>

As the conventional intraoral radiograph does not reveal the true nature and exact location of the lesion, CBCT scans are recommended for such cases. Hence CBCT scan was scheduled to confirm the provisional diagnosis of inflammatory resorption with perforation and

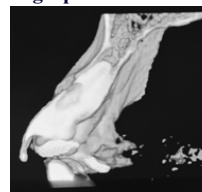
to determine the exact location of the resorptive defect (Fig 2). Following this, a two phase treatment plan was scheduled. First phase comprised of an orthograde endodontic therapy with management of the resorptive defect and a second phase of surgical intervention if necessary after three months follow up.

Non-surgical root canal treatment was initiated after local administration of 2% lidocaine containing 1:80000 epinephrine under rubber dam isolation. Brisk bleeding confirmed active resorptive lesion. Calcium hydroxide intracanal dressing was given in order to dissolve necrotic soft tissue and to control intracanal bleeding. Access cavity temporization was done using light-cured glass ionomer (GI) cement (Fuji II LC, GC Corporation, Tokyo, Japan).

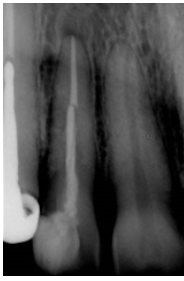
Patient was recalled after one week. Under rubber dam isolation, chemical debridement of the root canal and resorption lacuna was performed using warm sodium hypochlorite solution. Working length and the distance of the perforation site from the incisal reference point were estimated from CBCT images. Canal instrumentation was conducted to master apical file set to #30. Paper points were used to dry the canals after cleaning and shaping. Obturation of the canal apical to the perforation was performed with gutta-percha and AH plus sealer. The defect in the radicular dentine at the site of resorptive perforation was repaired using biodentine. The remaining root canal length was obturated with warm vertical compaction of gutta-percha. Sealing of the access cavity was performed by glass ionomer cement and composite to ensure flawless coronal seal.



**Fig 1: Pre operative radiograph**



**Fig 2: Pre operative CBCT**



**Fig 3: 3 month follow up radiograph**

Patient was recalled after 3 months. The tooth was asymptomatic, functional and the periapical radiograph showed reduction in the radiolucency, both at the periapex and around the area of perforation repair.

## DISCUSSION

Mineralized or denuded areas of the root surface attracts hard tissue-resorbing multinucleated cells. They colonize the damaged areas of the root and initiates resorption.<sup>7</sup> This type of resorption may be referred to as inflammatory root resorption.<sup>8</sup> Resorption once initiated gets prolonged by persistent infection in the root canal. This prolonged stimulation of the resorbing cells results in progressive inflammatory resorption and it results in exaggerated destruction of the root dentin.

Root perforations can occur pathologically as a result of resorption and caries or iatrogenically during root canal treatment.<sup>9</sup> In the present case, history of previous incomplete root canal treatment was obtained which assisted in the diagnosis.

CBCT provides the clinician a vast amount of relevant anatomical information with respect to resorptive lesions of dental hard tissues. They are geometrically accurate, and the problems of anatomical noise seen with periapical radiographs can be eliminated.<sup>10</sup> CBCT images aided in the correct diagnosis and management of this internal root resorption case with perforation in the maxillary lateral incisor. Perforation was identified 13mm apical to the incisal edge, located distally and buccally at the junction of middle third and apical third of the root canal. Information obtained regarding exact location and size of the perforation site helped to reduce the risk of inadvertent extrusion of 3% NaOCl solution through the perforation. The data obtained by CBCT imaging guided in orienting the side-venting irrigating needle tip to allow controlled and effective irrigation. Gentle manual dynamic agitation of the irrigating solution was performed using a pre-measured gutta-percha point kept short of the level of perforation.

Considering the location of the resorption and length of roots, the root canal space apical to the perforation site of the canal was obturated with gutta-percha and AH-Plus sealer. Due to its excellent properties, such as low solubility, small expansion, adhesion to dentin and its very good sealing ability AH Plus is looked as a "Gold Standard".<sup>11</sup> Resorption site including the perforation site was first packed laterally with biodentine and then obturated using warm vertical condensation condensation of gutta-percha (Meta Biomed Co. Ltd, Cheongju City, Chungbuk, Korea). Obturation was performed under radiographic monitoring.

Treatment of such a case is intended to seal all the pathways of communication between the root canal system and its surrounding tissues. Filling material should be biocompatible, nontoxic, noncarcinogenic, easily obtainable, convenient to use, inexpensive and promote the growth of cementum or allow for its replacement by new, healthy bone by acting as a barrier against which the root canal obturating material is placed.<sup>12</sup>

In the present case biodentine was used for management of the defect caused by perforation and resorption and it showed favourable results. Biodentine is called as "bioactive dentin substitute".<sup>13</sup> It has a setting time of 9 to 12 min, high compressive strength, high alkaline pH, excellent biocompatibility, increased resistance to erosion, microleakage and better sealing than MTA, Dycal and GIC. All such properties makes it a favourable material for perforation repair. It provides the required biocompatible interface with the periradicular tissues.<sup>14,15</sup> This was similar to a case report by Guneser et al, where Biodentine showed considerable performance as a perforation repair

material even after being exposed to various endodontic irrigants as compared to MTA.<sup>16</sup>

Three months recall shows that the patient is asymptomatic. The resorptive lesions has stopped progression. Even though periapical lesion is persistent, periradicular tissue adjacent to the perforation site shows signs of healing.

## CONCLUSION

Accurate diagnosis, removal of the cause and proper management of inflammatory root resorption aids in improving the prognosis and to maintain the tooth in function for a longer period of time. Superior diagnostic accuracy of CBCT combined with the better perforation repair material such as biodentine resulted in an improved management of the resorptive and perforation defect in the root canal walls.

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