ISSN Print: 2394-7489
ISSN Online: 2394-7497
IJADS 2025; 11(3): 280-283

www.oraljournal.com
Received: 06-06-2025
Accepted: 10-07-2025

Dr. Geethu V Mohan
Junior Resident, Department of Conservative Dentistry and Endodontics, Govt. Dental College, Thiruvananthapuram, Kerala, India

Dr. Shiji Dinakaran
Professor & HOD, Department of Conservative Dentistry & Endodontics, GDC, Thiruvananthapuram, Kerala, India

Dr. Amala KV
Junior Resident, Department of Conservative Dentistry and Endodontics, Govt. Dental College, Thiruvananthapuram, Kerala, India

Dr. Ardra CK
Junior Resident, Department of Periodontics and Implantology, Govt. Dental College, Thiruvananthapuram, Kerala, India

Corresponding Author:
Dr. Geethu V Mohan
Junior Resident, Department of Conservative Dentistry and Endodontics, Govt. Dental College, Thiruvananthapuram, Kerala, India

Management of Heithersay's class II external cervical root resorption: A case report

Geethu V Mohan, Shiji Dinakaran, Amala KV and Ardra CK

DOI: https://www.doi.org/10.22271/oral.2025.v11.i3d.2219

Abstract
External cervical resorption (ECR), also known as invasive cervical resorption (ICR), is a rare and progressive form of tooth resorption that begins just below the cementoenamel junction and can lead to significant structural destruction if left untreated. This case report describes the diagnosis and management of ICR in a 32-year-old female presenting with intermittent pain in the maxillary left lateral incisor. Clinical and radiographic examinations, supported by cone-beam computed tomography (CBCT), confirmed a Heithersay Class 2 and Patel's 3D classification 2Bp lesion. Treatment included nonsurgical root canal therapy combined with surgical removal of resorptive tissue, followed by restoration with mineral trioxide aggregate (MTA) and resin-modified glass ionomer cement (RMGIC). Calcium hydroxide was later used as an intracanal medicament, and obturation was completed with gutta-percha and a bioceramic sealer. At 12-month follow-up, the patient remained asymptomatic, with radiographic evidence of successful healing and no recurrence of resorption. This case highlights the importance of CBCT for accurate diagnosis and treatment planning, as well as the value of bioactive restorative materials in managing invasive cervical resorption.

Keywords: External Cervical Resorption (ECR), Invasive Cervical Resorption (ICR), Cone-beam Computed Tomography (CBCT), Mineral Trioxide Aggregate (MTA), Resin-Modified Glass Ionomer Cement (RMGIC), Root canal therapy, case report

1. Introduction
So, there's this condition called External Cervical Resorption (ECR), or sometimes Invasive Cervical Resorption (ICR). It's a fairly rare, sneaky, and often aggressive problem where a tooth gets eaten away from the outside, and it can happen to any of the permanent teeth. We can define it as a spot of resorption that starts on the root surface just below the cementoenamel junction, right in the area where connective tissue attaches [1]. What makes it tricky is its specific location and how it invades the tooth, leading to a progressive and destructive loss of tooth structure [2, 3]. Things that might put you at risk for ICR include trauma, braces, internal tooth bleaching, or even some type of surgical procedures [4].
ICR usually doesn't cause any pain, so it's often found when someone notices a pinkish spot on the tooth near the gingiva. That pink color shows up because the tissue doing the resorbing has a lot of blood vessels, and you can see it through the thinned-out dentin and enamel. On periapical radiograph, it shows up as an uneven dark spot with ragged edges, often described as looking 'moth-eaten [5, 6]. To really figure out what's going on and plan the best treatment, the use of 3D imaging like a cone-beam CT scan (CBCT), which gives a super clear picture of how far it has spread and its relationship to the pulp [7].
Successfully treating ICR means stopping the resorptive process and rebuilding the part of the tooth that's been lost. Dentists have used several materials to restore these defects, including mineral trioxide aggregate (MTA), glass ionomer cement, and calcium enriched mixtures [8]. Bioactive materials like Biodentine, a really promising choice because their strength and hardness are very similar to natural dentin, making them a great substitute. Since these lesions can be so invasive, often affecting both the crown and root parts of the tooth, we usually need to use a combination of restorative materials [9, 10].
This case report is about a patient whose ICR in an upper left lateral incisor was successfully treated. The tooth was managed with surgery and then restored using both Mineral Trioxide

Aggregate (MTA) and Resin-Modified Glass Ionomer Filling Material (RMGIC) [11].

2. Case report

A 32-year-old woman reported to The Department of Conservative Dentistry and Endodontics, with an intermittent pain in her upper left front tooth, that had been bothering her for a month. Patient had a history of a hit to the tooth about five years back. Her medical and family history were non-contributory. Cold and electric pulp testing were performed and confirmed that the tooth was nonvital. Her gingiva looked normal, with normal probing depths, and the tooth wasn't loose in the slightest.

During the clinical examination, tenderness on percussion was found on tooth #22(Figure 1a). On periapical radiograph, the image showed an unusual dark radiolucency on the distal side of the root, up near the crown, which suggested external resorption. The lesion with very clear borders with the root canal outline right through it, and it was on the root surface. A periapical radiolucency was also associated with tooth #22 (Figure 2b).

Fig 1a: Preoperative intraoral photograph; b: preoperative periapical radiograph

On cone-beam CT (CBCT) scan the size, spread, and depth of the lesion were identified. Based on those CBCT images and the 3D models a diagnosis of invasive cervical external resorption, specifically a Class 2 (by Heithersay's classification) and 2Bp (using Patel's 3D classification), determined as in Figure 2.

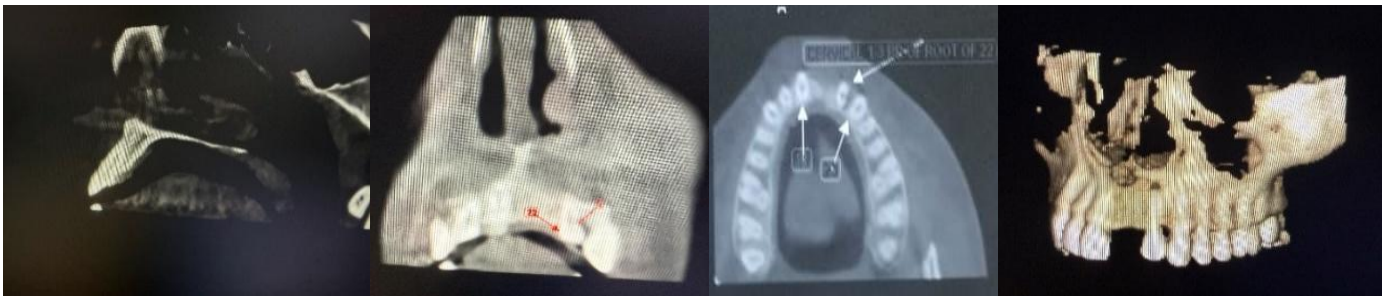

Fig 2: Cone-beam computed tomography images in sagittal, coronal, axial sections and three-dimensional reconstruction

So, following the standard treatment plan for this kind of defect, the treatment involved restoring the tooth from both externally and internally. The plan was to perform a root canal, surgically clear out all the inflamed tissue from the defective area in the root, and then restore the defect using two materials: Mineral Trioxide Aggregate (MTA) and Resin-Modified Glass Ionomer Cement (RMGIC).

Initially, informed consent was obtained from the patient. After local anesthesia, access opening done on the palatal side of the tooth. Once we figured out the working length, cleaning and shaping done using a series of manual and rotary files (Protaper Gold S2 and F2). Canal irrigated thoroughly with a 5.25% sodium hypochlorite solution and then placed a corticosteroid-antibiotic paste inside the canal. Followed by temporary restoration given.

At the second appointment, infiltration given to the patient and a small mucoperiosteal flap was reflected to see the defect (Figure 3a) and removal of any remaining inflamed tissue with an excavator was done. A small cotton ball with 90% trichloroacetic acid was blotted dry and pressed gently onto the defect for about a minute. Then, smoothed the edges of the defect with a small round bur. The temporary restoration was removed, the canal was irrigated, and a gutta-percha cone was placed inside to hold the space. Then MTA packed into the defect and gave it 15 minutes to start setting (Figure 3b). A layer of RMGIC was placed over the MTA up to the cementoenamel junction (Figure 3c). Suturing of the flap was done with 3‘0’ silk sutures, placed a periodontal dressing (Figure 4a), and scheduled the patient for suture removal in a week. A final periapical radiograph was taken to confirm the MTA and RMGIC repair looked good (Figure 4b).

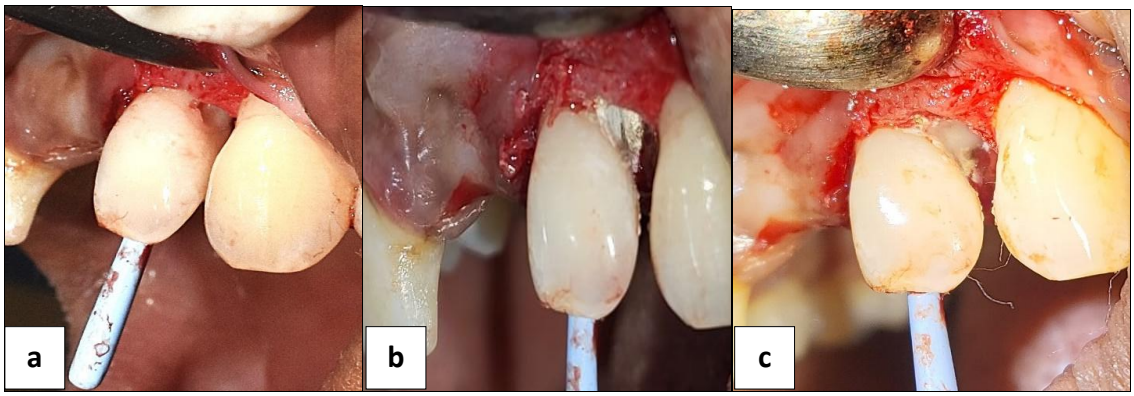

Fig 3: a) Surgical exposure of resorption defect; b) Placement of MTA over the resorption defect; c) Placement of RMGIC at cemento-enamel junction

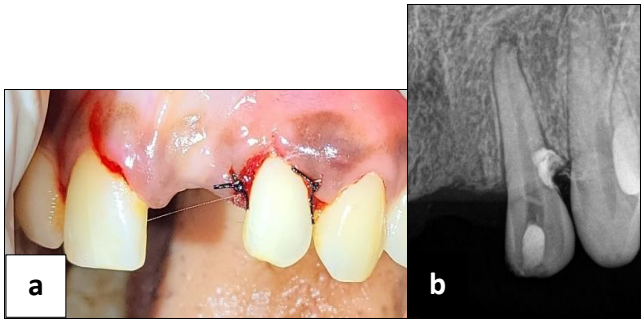

Fig 4: a) Immediate postoperative photograph; b) Immediate postoperative radiograph

Two weeks later, patient recalled, reopened the tooth's access cavity, and put a calcium hydroxide medication (Safe Endo Calcicure) inside the canal for three weeks. Obturation of the root canal was done with an F2 gutta-percha cone (Protaper Gold) and a BioActive RCS (Safe Endo) bioceramic sealer, which is in Figure 5b. The tooth got its permanent restoration using a resin-modified glass ionomer cement (RMGIC) and composite. Patient reviewed at 3, 6 and 12 month follow up. At the 1-year follow-up, the patient was still completely asymptomatic (Figure 6a,b). Both on clinical and radiographic examination confirmed that the resorption hadn't come back, the gingiva had completely healed, probing depths were normal, and there was no loss of clinical attachment.

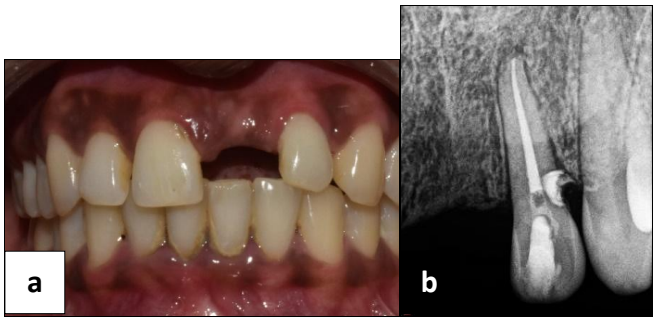

Fig 5: a) Postoperative photograph after 2 weeks; b) Post obturation radiograph

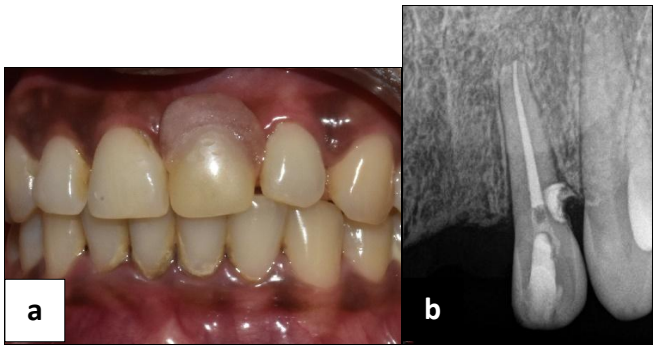

Fig 6: a) Follow-up photograph after 1 year; b) Follow-up radiograph after 1 year

3. Discussion

So, invasive cervical resorption is this sneaky but progressive condition where the outside of a tooth root gets eaten away, often after a tooth gets knocked around a bit. It starts with cells from the periodontal ligament holding the tooth in place, and this fibrous, vessel-filled tissue invading the cervical area of the tooth. This tissues then just starts resorbing through the dentin, enamel, and cementum [13]. It's pretty invasive and aggressive, which has sparked a lot of debate about what this lesion really is.

The tricky part about ICR is that it can start and get worse without causing any pain, so it's often just found by accident during a routine dental examination or on an x-ray. Figuring out if it's this or a similar problem called internal root resorption can be tough, which is why a 3D scan (a CBCT) is so valuable for getting the diagnosis right. Catching it early is a huge factor in whether we can successfully treat it [14].

Different people have suggested various ways to manage ICR, but the main goal is always to completely clear out the tissue causing the problem and then repair the defect [10, 18]. In this specific case, the lesion had done a lot of structural damage below the cementoenamel junction (the CEJ), so we had to do surgery to even get to it. Since the tooth was no longer vital, a root canal was also part of the plan.

After a thorough cleaning of the defect, white MTA was used to repair the root surface because it's bioactive and gets along well with the tissues around the root. MTA also releases calcium ions, which creates an alkaline environment that bone-forming cells need. This release of calcium and hydroxide ions also stimulates a bunch of other key proteins, which helps to promote regeneration and remineralization of the area [13, 15].

The thing about MTA is you can't polish it, so its rough surface can be a plaque magnet if it's exposed under the gingiva. To deal with that, we put a layer of Resin-Modified Glass Ionomer Cement (RMGIC) over the MTA right up to the Cementoenamel Junction (CEJ). This material bonds to the tooth, looks better, releases fluoride, and gives a good surface to etch and bond a regular resin filling onto later [16, 17, 18].

During the root canal, we used a couple of different medications inside the canal. First, a paste with a corticosteroid and antibiotic, and later, calcium hydroxide. Using that steroid-antibiotic paste right away has been shown to lead to a lot less resorption and better healing than if you use calcium hydroxide in the beginning [19]. In fact, using calcium hydroxide too early can cause the tooth to fuse to the bone. When you put calcium hydroxide in the canal, it lets out hydroxyl ions that travel through the tooth to the Periodontal Ligament (PDL), and this happens even faster when the outer cementum layer is gone. This can make the outside of the root too alkaline (pH 8.0-9.5), which is above the level where the ligament cells stop attaching and growing. Later on, once the inflammation has calmed down, a calcium hydroxide dressing helps stabilize the resorption by keeping the area alkaline [20].

At the 12-month follow-up, the treatment for the invasive cervical resorption defect that we fixed with MTA was considered a success based on the clinical and radiographic examinations. However, we'll still need to do regular annual check-ups to make sure everything stays stable and to see what the long-term prognosis looks like.

4. Conclusion

Catching it on time, completely removing the problem tissue, and handling the restoration properly are key to a successful outcome and saving the tooth long-term. Many studies show external cervical resorption (ECR) often has a strange, complex invasion pattern, making it tough to assess. Using a CBCT scan in this case allowed for a precise evaluation of the lesion and helped in selecting the best treatment approach for effective management. While this case report shows a successful clinical result, we still need further studies for more comprehensive evidence on the best way to restore these Invasive Cervical Resorption (ICR) defects.

References

1. Hammarstrom L, Lindskog S. General morphological aspects of resorption of teeth and alveolar bone. Int Endod J. 1985;18(2):93-108.
2. Tronstad L. Root resorption-etiology, terminology and clinical manifestations. Endod Dent Traumatol. 1988;4(6):241-252.
3. Heithersay GS. Invasive cervical resorption. Endod Top. 2004;7(1):73-92.
4. Heithersay GS. Invasive cervical resorption: an analysis of potential predisposing factors. Quintessence Int. 1999;30(2):83-95.
5. Heithersay GS. Clinical, radiologic, and histopathologic features of invasive cervical resorption. Quintessence Int. 1999;30(1):27-37.
6. Jeng PY, Lin LD, Chang SH, Lee YL, Wang CY, Jeng JH, *et al*. Invasive Cervical Resorption-Distribution, Potential Predisposing Factors, and Clinical Characteristics. J Endod. 2020;46(4):475-482.
7. Patel S, Dawood A. The use of cone beam computed tomography in the management of external cervical resorption lesions. Int Endod J. 2007;40(9):730-737.
8. Abbott P. Prevention and management of external inflammatory resorption following trauma to teeth. Aust Dent J. 2016;61(S1):82- 94.
9. Malkondu Ö, Kazandag MK, Kazazo˘ glu E. A Review on Biodentine,˘ a Contemporary Dentine Replacement and Repair Material. Biomed Res Int. c2014, p. 160951. DOI:10.1155/2014/160951.
10. Baranwal AK. Management of external invasive cervical resorption of tooth with Biodentine: A case report. J Conserv Dent. 2016;19(3):296-299.
11. Agrawal V, Vasavda K, Kapoor S. Novel tri-layered restorative technique for management of external inflammatory invasive cervical resorption. J Interdisciplinary Dent. 2021;11(3):144. DOI:10.4103/jid.jid_64_20.
12. Patel S, Foschi F, Mannocci F, Patel K. External cervical resorption: a three-dimensional classification. Int Endod J. 2018;51(2):206-214.
13. Heithersay GS. Invasive cervical resorption following trauma. Aust Endod J. 1999;25(2):79-85.
14. Vk F, N Y, Hn F, Fn B. Diagnosis of invasive cervical resorption by using cone beam computed tomography: report of two cases. Braz Dent J. 2012;23(5):602-607.
15. Ikhar A, Thakur N, Patel A, Bhede R, Patil P, Gupta S, *et al*. Management of External Invasive Cervical Resorption Tooth with Mineral Trioxide Aggregate: A Case Report. Case Rep Med. c2013, 139801. DOI:10.1155/2013/139801.
16. Tavares WLF, Lopes RCP, Oliveira RR, Souza RG, Henriques LCF, Ribeiro-Sobrinho AP, *et al*. Surgical management of invasive cervical resorption using resin-modified glass ionomer cement. Gen Dent. 2013;61(7):16-18.
17. Sharma R, Swami A, Smitha B. Surgical root repair of extensive invasive cervical resorption defects involving the cementoenamel junction: Two case reports. Endodontology. 2018;30(2):171. DOI:10.4103/endo.endo_98_17.
18. Hommez GMG, Browaeys HAA, Moor R. Surgical Root Restoration After External Inflammatory Root Resorption: A Case Report. J Endod. 2006;32(8):798-801.
19. Bryson EC, Levin L, Banchs F, Abbott PV, Trope M. Effect of immediate intracanal placement of Ledermix Paste(R) on healing of replanted dog teeth after extended dry times. Dent Traumatol. 2002;18(6):316-321.
20. Andrade C, Morais N, Demenech L, Tomazinho F, Filho B, Leonardi F, *et al*. Endodontic treatment of internal root resorption: a case report. RSBO. 2017;13(2):131. DOI:10.21726/rsbo.v13i2.283.

How to Cite This Article
Mohan GV, Dinakaran S, Amala KV, Ardra CK. Management of Heithersay's class II external cervical root resorption: A case report. International Journal of Applied Dental Sciences. 2025;11(3):280-283.