



# Combination Therapy of Human Chorion Membrane with Platelet Rich Fibrin in Surgical Endodontics: A Novel Approach

Roy D<sup>1\*</sup> and Kalita T<sup>2</sup>

<sup>1</sup>Department of Conservative Dentistry and Endodontics, Regional Dental College, Srimanta Sankaradeva University of Health Sciences, India

<sup>2</sup>Department of Conservative Dentistry and Endodontics, Government Dental College, Srimanta Sankaradeva University of Health Sciences, India

**\*Corresponding author:** Debosmita Roy, Department of Conservative Dentistry and Endodontics, Regional Dental College, Guwahati, P.O, Indrapur, Dist: Kamrup (M), Assam, Pin: 781032, India, Tel: + 919435987358; ORCID: <https://orcid.org/0000-0002-9485-1185>; Email: debosmitaroy26@gmail.com

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## Abstract

Conventional Endodontic therapy has a high success rate. However, failed endodontic therapy with persistent periapical lesion may indicate of an apical cyst that require surgical intervention. This case report focuses on surgical retreatment of mandibular central incisors. A 30year old female patient reported to our department with pain and recurrent swelling with respect to mandibular central incisor region from last some months. Radiological investigation revealed faulty root canal treatment irt #41 and a periapical pathology involving 31, 32, 41, 42 suggestive of radicular cyst. As a conventional treatment modality root canal treatment of #31, #32, #42 along with retreatment of #41 was initiated following the standard protocol. Even after the non- surgical approach was performed, the patient presented with the same symptoms. Hence forth, surgical intervention that includes enucleation, debridement, placement of autologous platelet concentrates (PRF) and Human chorion membrane (HCM) was performed and at 12month assessment, the radiograph showed good bone healing and resolution of the clinical symptoms.

**Keywords:** Human Chorion Membrane; Guided Tissue Regeneration; Platelet Rich Fibrin; Retreatment; Surgical Endodontics

## Abbreviations

HCM: Human Chorion Membrane; PRF: Platelet Rich Fibrin; PRP: Platelet Rich Plasma; ACMS: Amnion Chorion Membranes.

## Introduction

The main goal of endodontic therapy is to eliminate the etiological factor of pulpal and periapical pathology and to

provide a three- dimensional seal of the root canal system so as to restore the teeth in their normal functional and esthetic form. Nonsurgical endodontic treatment is the primary treatment option sought but in cases of persistent periapical infection, surgical endodontic therapy is imperative.

Surgical endodontics including root-end resection, root end filling, cyst enucleation has been practiced since at least the mid- 1800s. The main goal of surgical endodontic therapy is to eradicate periapical pathology followed by regeneration of

periapical tissues.

Various biomaterials are being used in surgical endodontics like platelet rich fibrin (PRF), platelet rich plasma (PRP), bone grafts to augment the tissue regeneration of the periapical tissues. Human Amnion Chorion Membranes (ACMs) have emerged in the field of oral surgery as well as periodontology for the purpose of guided tissue regeneration.

But although human amniotic membrane has been used in the field of endodontic surgery, there have not been any case regarding the use of Human Chorionic membrane along with PRF for endodontic periapical surgery. Cyst enucleation with root end resection as well as root end filling is the most widely used periapical surgical procedure in cases of radicular cyst.

In this case report, we tend to show how effective is the use of combination of Human Chorion membrane (HCM) alongwith PRF where cyst enucleation is done in the lower anteriors .

## Case Report

The present case report is about a 30 year old female patient who reported to the department of conservative dentistry and endodontics with the chief complaint of pain and swelling off and on from the mandibular front teeth. The patient's medical history was not relevant.

Patient gave history of previous endodontic treatment in relation to one lower anterior teeth during 10 years back. On clinical examination, the tooth # 31-32, #41-42 were tender on percussion, whereas # 33and #43 responded normal on percussion.

The pulp vitality test using heat test, cold test and Electric pulp test found to be negative in relation to #31, #32, #41 and #42. Intraoral periapical radiograph showed periapical radiolucent lesion extending from the distal root surface of #32 till the mesial surface of #43 and poorly obturated #41 (Figure 1a).

Following this, the patient was explained regarding the treatment plan and proper consent has been taken before the start of the procedure.

Re-treatment was initiated in relation to # 41 and conventional root canal treatment initiated i.r.t. #42, #31, #32. Gutta percha was removed from #41 using Gutta percha solvent and H- file and working length taking for all the respective with no 15 K file ( Dentsply M access) (Figure 1 b, c & d).

Root canals were cleaned and shaped using hand k files (Dentsply M access) system upto the size of 45 with a taper

of 0.02 with step back technique till three sizes larger than the master apical file. 3% Sodium hypochlorite (Multilabs) and 17% EDTA were used intermittently for irrigating the canals. The final rinse was done using normal saline.

The canals were dried using absorbant paper points (Dentsply Maillefer). Following this the canal was coated with calcium hydroxide intracanal paste and kept for seven days. After seven days the canals were revisited and intracanal medicament was removed with 17% EDTA and the master apical file (45, 2% taper).

The canals were checked for any exudate and then dried using absorbent points. The root canals of #41, #42, # 32 were then obturated with AH Plus sealer (Maillefer Dentsply, Konstanz, Germany) and thermoplasticised gutta percha (Figure 1e). The access cavity was filled with resin based composite. The tooth #31 was not obturated since there was exudate present and hence the surgery was planned immediately.

For surgery, the patient was advised premedication of antibiotics and NSAIDs. The surgical site was cleaned using 10 % Povidone Iodine solution (betadine).

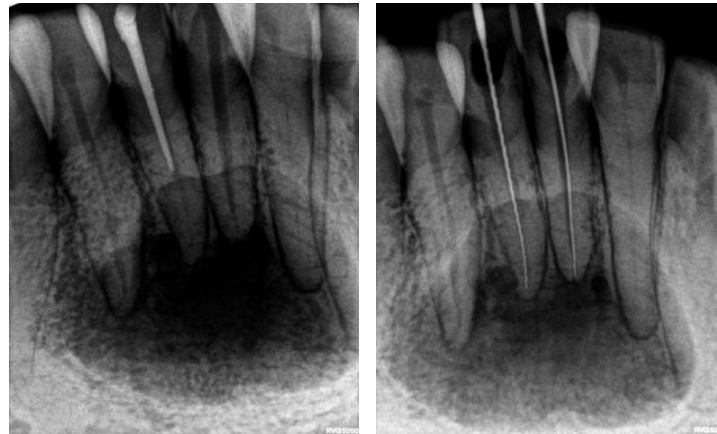
Following that inferior alveolar nerve block was given using 2% Lignocaine hydrochloride with 1: 80000 Adrenaline. Crevicular incision was placed extending from distal surface of the #33 to #43 with no #15 C BP blade. And suprapariosteal vertical incision was given with intention to preserve the papilla (Figure 4 b).

Mucoperiosteal flap was raised and the bony cavity was explored. Upon exploration it showed that there is destruction of the buccal cortical plate.

The cyst was enucleated in toto and sent for biopsy. The cavity was cleaned and inspected to see if there are any remnants left behind. Further, patient's blood has been taken and centrifuged in PRF making machine and PRF made. PRF placement done followed by chorion membrane placement (Figures 5b and 5C).

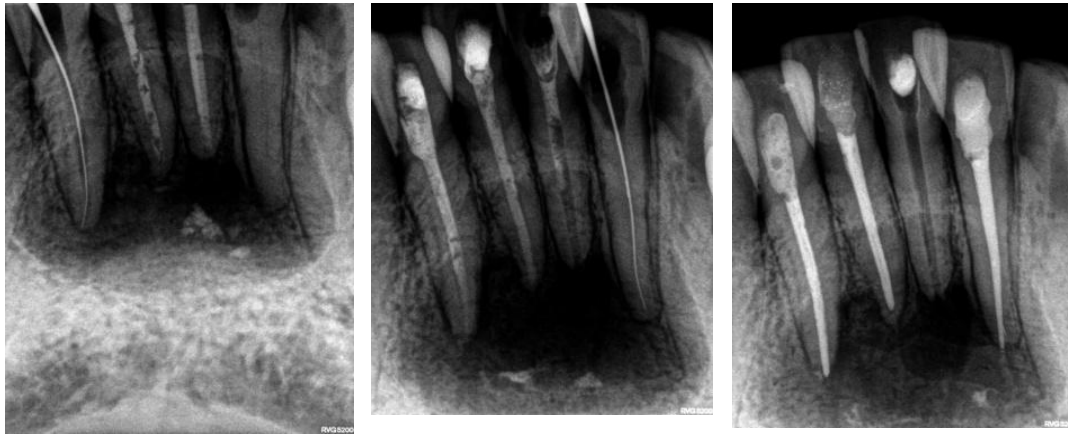
The Chorion membrane was procured from Tata memorial Hospital Tissue Bank, Mumbai, India. Interdental sling suture placed. Post operative instructions given and patient was recalled next day for placement of MTA irt #31 in orthograde manner and after one day the canal was sealed using backfill ( E & Q master) ( Figures 2b & 2c).

Patient was recalled after one week for suture removal and re evaluation (Figure 5e). re evaluation again done after 1 month, 3 months and one year. The healing after the use of PRF and HCM has been satisfactory (Figures 1-5).



a.

b.



c

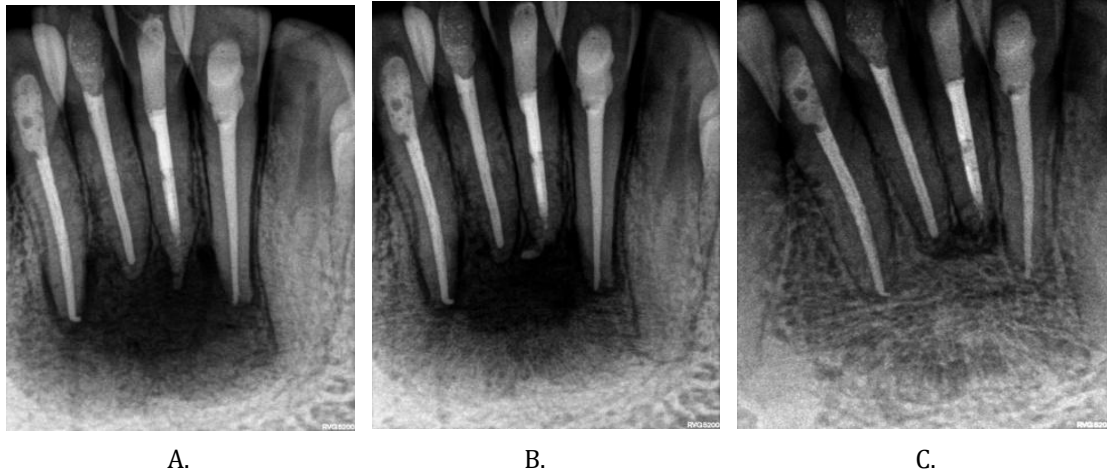
d

e

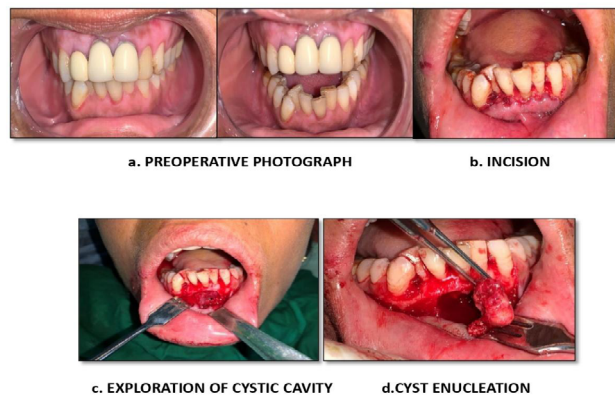
**Figure 1:** a. Pre operative radiograph. B. Removal of gutta percha and working length determination #41 and #31 , c and d. Working length determination #42 and #32. E. Post obturation in relation to #32, #41 #42.



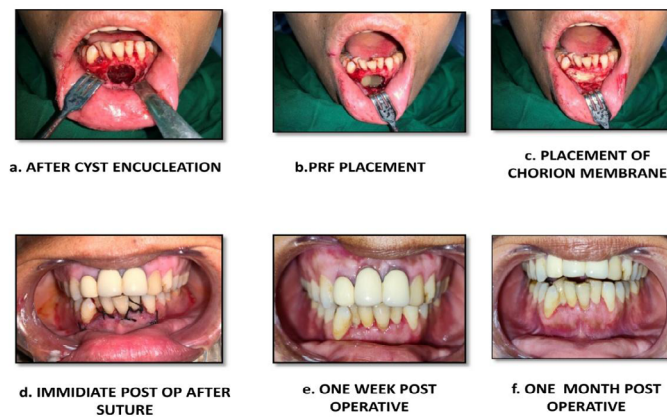
**Figure 2:** a. Immediate post operative, b. After placement of MTA (#31), c. post obturation with backfill i.r.t. #31.



**Figure 3:** A. 1 month post operative radiograph. B. 3 months post operative radiograph. C. One year post operative radiograph.



**Figure 4:** Clinical Photographs.



**Figure 5:** Clinical photographs.

## Discussion

Conventional root canal therapy is the first sought line of treatment in cases of apical periodontitis. But non – surgical endodontics does not fulfil the aim in long standing infective cases as well as in large cystic lesion where there is destruction of the bone. As regenerative potential in such cases is less.

In this case report, the patient had a previously endodontic treated tooth as well as the adjacent teeth were also infected. Moreover, there was a localized periapical lesion with well circumscribed borders which suggested the presence of cystic lesion.

In this case, we have done cyst enucleation as it is the primary mode of treatment. After the cystic enucleation, to augment the healing, Platelet Rich Fibrin has been used. Platelet rich fibrin are second generation platelet concentrates which have large amount of growth factors necessary for tissue regeneration. The fibrin matrix of PRF gets slowly releases the growth factors, such as PGDF, TGF and VEGF that enhance healing. Many studies have validated the potential of PRF in bone formation [1-3].

Guided tissue regenerative procedures include the usage of barrier membranes in surgical procedures. The reason behind using Human Chorionic membrane is that the chorion is thicker and tougher than the amnion, which is more elastic and thinner. It is made up of two layers; the trophoblast and the extra- embryonic mesoderm. Since there was destruction of the bone in larger amount as well as dehiscence in the bone, the gingival tissue would have tried to recede down, leading to periodontal defect. Thus using a chorion membrane as barrier technique helps the healing of gingival in a good manner. Moreover chorion membrane has various growth factors too which aid in tissue regeneration [4-6].

Using MTA as the orthograde material was done only because, the apex could not be sealed before the surgery due to the presence of exudates. Although, studies have found that MTA can set in presence of tissue fluid, to avoid any kind of mishaps, this was done just next day after the surgery where the periapical causative agent was removed.

Following that obturation was done with backfill technique, since conventional lateral compaction would have not created a hermetic seal.

## Conclusion

With the advent of technology and research, various biomaterials have emerged successfully. Use of Human Chorion Membrane alongwith Platelet Rich Fibrin has shown very good results in tissue healing and bone formation. Newer case series or reports should be done in order to get longterm beneficial results.

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