



SMART DENTAL UPDATES

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Dear Doctor,

Greetings from Micro Labs Limited. We are happy to bring you “**SMART DENTAL UPDATES**” which contains latest and interesting news in the field of Dentistry.

This issue contains

- Outcome Assessment of Teeth with Necrotic Pulps and Apical Periodontitis Treated with Long-term Calcium Hydroxide.
- Long-term Retention of Avulsed Maxillary Incisors with Replacement Root Resorption: A 9-Year Follow-Up.
- Autotransplantation of Two Immature Third Molars with the Use of Leukocyte-Platelet-Rich Fibrin.

Should you require any specific article or medical information, please feel free to contact us at medicalservices@microlabs.in

Looking forward to your valuable feedback

Best Regards,
Medical Team, Micro Labs Limited

Outcome Assessment of Teeth with Necrotic Pulps and Apical Periodontitis Treated with Long-term Calcium Hydroxide

Apical periodontitis is an inflammatory lesion in the periodontal tissues that is caused mostly by bacterial elements. In non-treated teeth apical periodontitis represents a defensive response to a primary infection in a necrotic pulp. Calcium hydroxide has wide-spectrum, antibacterial activity within the root canal system. Detoxifies bacterial endotoxins, exerts anti-inflammatory effects, and induces



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healing of periapical tissues. Short-term use of Calcium hydroxide in teeth with apical periodontitis have been shown significantly high healing rates.

The aim of this retrospective, cohort case series was to assess the outcomes of teeth with necrotic pulps and apical periodontitis using long-term calcium hydroxide and to explore the possible association of fractures caused by long-term Ca(OH)₂ exposure.

For large long-standing radiographic lesions, the use of long-term calcium hydroxide resulted in a predictably high incidence of healing.

A total of 242 cases, diagnosed with pulpal necrosis and apical periodontitis were enrolled in the study and were treated with long-term calcium hydroxide using a standardized protocol. Injectable and powdered calcium hydroxide were placed subsequently in the root canal system. Cases were re-evaluated until radiographic healing was observed within a 3-month period. Clinical and radiographic assessments were performed. Pre- and postoperative periapical radiographs were evaluated using the PAI system.

Out of 242 cases, two hundred nineteen subjects completed their treatment with follow-up with no signs or symptoms of fracture. Calcium hydroxide application time was 5.4 months with a range of 1–12 months. Approximately at the 3-month interval, most of the cases demonstrated healing. Mean preoperative and postoperative PAI scores were 4.07 (± 0.80) and 1.76 (± 0.70). Student t test revealed mean preoperative PAI score of 4.04 (60.80) and 4.36 (60.73), respectively for the healed and diseased cases. PAI score was higher for diseased cases when compared with healed cases. The Difference was statistically insignificant between the 2 groups ($P = .068$).



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Preoperative radiographs showed that 216 of 219 teeth with a "lucency" status. The radiolucency failed to resolve in 22 of 219 teeth at follow-up. 90.0% (197/219) were classified as "healed," and 10.0% (22/219) were classified as "nonhealed" at the most recent follow-up visit. 7 of 22 opted for periapical surgery, 1 of 22 for extraction, and 14 of 22 subjects elected no further treatment of these "diseased" cases. Kappa statistics revealed almost perfect agreement for inter-rater ($k=0.91$) and intrarater ($k=0.95$) reproducibility for both examiners.

Healing Rates according to the Periapical Index Score by the Latest Follow-up

	1	2	3	4	5
Count	0	3	54	87	75
Rate (%)	–	100	94.40	90.80	85.30

Within the limitations of this study, predictably high incidence of healing was observed with the use of long-term calcium hydroxide in the treatment of teeth with necrotic pulps and apical periodontitis. No association between long-term Ca(OH)_2 use and the incidence of fractures during this study. Ca(OH)_2 used as a long-term root canal medicament was associated with high rates of resolution of periapical radiolucencies.

Reference: Best S et al. Outcome assessment of teeth with necrotic pulps and apical periodontitis treated with long-term calcium hydroxide. Journal of Endodontics. 2021 Jan;47(1):11-8



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Long-Term Retention of Avulsed Maxillary Incisors with Replacement Root Resorption: A 9-Year Follow-Up

A 15-year-old boy with traumatic injury to his maxillary incisors was referred to the Department of Conservative Dentistry, Dental Hospital.

He had a bicycle accident a day ago and received emergency treatment for his injured anterior teeth. Maxillary anterior teeth were splinted with composite and a 0.18-inch stainless steel wire, from the left first premolar to the right first premolar (#14 to #24). Tenderness upon percussion of the maxillary anterior teeth and an uncomplicated crown fracture on the maxillary right lateral incisor was revealed by Intraoral examination. Periapical radiographs revealed radiolucency between the root surface



Figure : Periapical radiographs show gradual progression of root resorption.

and alveolar socket suggestive of improper repositioning, was detected in teeth #21 and 22. Repositioning was not attempted as more than 24 hour had passed since the accident. Both maxillary central incisors (#11 and 21) and the maxillary left lateral incisor (#22) were avulsed. Fractured labial bone plate was separated from the attached gingiva and interdental papillae were also torn.



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First aid was performed- For more than 40 minutes, 2 avulsed teeth (#21 and 22) were stored under dry conditions. Another avulsed tooth (#11) was brought in by the patient's friend later. The avulsed teeth were thus rinsed with saline before replantation. Local anesthesia (2% lidocaine) with slight finger pressure for replantation of the teeth was performed.

A flexible splint was applied from teeth #14 to #24 using wire and composite resins. and systemic antibiotic therapy was administered. Oral examination was performed after two weeks tooth injury. Upon percussion all the teeth were tender. Root canal treatment was performed on the avulsed teeth. Necrotic pulp tissue was removed under rubber dam isolation and root canals were chemomechanically prepared. Essential irrigant- sodium hypochlorite (2.5%) was used and calcium hydroxide was used for intracanal medication. Teeth #21 and 22 were obturated using the lateral compaction technique after five weeks of intracanal dressing. Splinting was removed 14 weeks after the accident, and tooth #11 was obturated.

The 1-year follow-up revealed radiological signs of external root resorption in the patient's maxillary left incisors (#21 and 22) but not in tooth #11. 2-year follow-up, clinical and radiological examinations revealed progression of external root resorption of teeth #21 and 22. At the 3-year follow-up, tooth #11 showed clear radiological signs of external root resorption. Replacement root resorption also seemingly progressed up to the 4-year, 4.8-year, and 5.6-year follow-up for tooth #22, 21, and 11, respectively. At the 9-year follow-up, a stable, aesthetically pleasing state of the teeth with no pathological findings or displeasing problems was noted.



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In Conclusion, Replacement root resorption was expected following dry storage of the avulsed teeth. Since the patient was 15 years old there might have been acceleration of the progress of the resorption. Replantation was carried out, considering the aesthetical, functional, and psychological needs of a growing child. Although there was progression of replacement root resorption as expected, the subject's teeth were maintained without occurrence of any adverse changes for nine years. Under most conditions, replantation of avulsed teeth is considered more beneficial than nonreplantation.

Reference: Yoon H et al. Long-Term Retention of Avulsed Maxillary Incisors with Replacement Root Resorption: A 9-Year Follow-Up. Case Reports in Dentistry. 2021 Jan. ID 8872859. <https://doi.org/10.1155/2021/8872859>

Autotransplantation of Two Immature Third Molars with the Use of Leukocyte-Platelet-Rich Fibrin

A 15-year-old male subject was referred to dental clinic for the two mandibular first molars (46 and 36) extractions because of extensive caries. Two teeth were treated endodontically and perforation of the pulp chamber's floor was observed due to decay. Tooth 36 showed a distal vertical bone defect.

Clinical examination showed poor oral hygiene and carious lesions. The subject revealed full mouth plaque score > 30% and a full mouth bleeding score > 35%. He had undergone scaling and received oral hygiene instructions to keep the etiologic factors under control. After orthodontic treatment and temporary partial removable prosthesis, autotransplantation was considered the best treatment option for both site 46 and 36.



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Teeth 38 and 48 were considered as donor teeth because of open apices and not-completed root development. 0.1% chlorhexidine swab and local anesthesia was administered using 4% articain solution for block and periapical



Initial Panaromic radiograph

anesthesia for the perioral skin and intraoral mucosa disinfection. To reduce the trauma the first mandibular molars were extracted as much as possible. High-speed fissure burs were used to separate the roots and were carefully luxated. To remove all residual granulation tissues NaCl solution was used and extraction sockets were thoroughly cleaned. Platelet-Rich-Fibrin was prepared according to the manufacturer's guidelines. Four 9 ml tubes were filled with peripheral blood by venipuncture. Tubes were centrifuged at 2700 rpm using the IntraSpin® centrifuge for 12 minutes, the fibrin clots were transferred to the Xpression™ box and Leukocyte-Platelet-Rich Fibrin (L-PRF) membranes were ready for use after 12 minutes.

To completely expose the crown and make the tooth extraction as atraumatic, at the donor tooth sites full thickness envelope flap was raised and bone removal was performed on the distal and buccal sites down to the cervical line of the tooth. To avoid pressure and mechanical damage to the periodontal ligament donor teeth were removed. Donor teeth were stored in the L-PRF exudate and the receiving sites were prepared by removing the interradicular bone. L-PRF membranes placed in the receiving sites and mandibular third molars were placed in the first molar extraction sites and a good fit of the donor tooth into the



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receiving sites was achieved. Occlusal surfaces were placed with sutures to stabilize the transplanted teeth and to reposition the flaps. Subject was prescribed 2 grams of amoxicillin for 5 days, 1000 mg of paracetamol every 8 hours according to pain, and 0.12% chlorhexidine mouth-rinse for 4 weeks during the postoperative period. The subject was advised to avoid brushing and interdental cleaning for 4 weeks in the surgical areas and to follow a soft diet for 2 weeks. Sutures were removed after 1 week and subject healing was uneventful. In presence of developing roots with open apices, the best practice is to allow for a natural pulp healing with a strict clinical monitoring. Clinical examination showed that autotransplanted teeth had physiologic mobility, absence of inflammation and discomfort at 2- month follow-up. The subject revealed absence of inflammation or infection probing depth values within normal range and the vitality tests were positive for both autotransplanted teeth at 6-month follow-up. The teeth in position 36 and 46 showed absence of infection and mobility and positive pulp vitality tests and the radiographic examinations showed closure of the root apices and absence of any periapical radiolucency or root resorption after 1-2-year follow-up. Satisfactory masticatory function and absence of pain, discomfort, or other adverse events was reported by the patient.

In conclusion, autotransplantation is a good treatment option in case of tooth loss for young and/or growing subjects. Moreover, the use of L-PRF in our clinical case seems to have played a beneficial role in the surgical procedure outcomes. To evaluate the usefulness of this procedure the absence of a good level of scientific evidence should encourage randomized controlled studies.

Reference: Lescure RM et al. Autotransplantation of Two Immature Third Molars with the Use of L-PRF. Case Reports in Dentistry. 2021 Jan 4;2021.



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