Supplementary File 1. Search strategy and reasons for exclusion.

Search strategy in Pubmed

1. FIRST SEARCH - SYSTEMATIC REVIEWS: ((regenerative) AND (endodontic)) AND (treatment OR therapy OR procedures OR technique) - 32 results- PUBMED
    1.1. Glynis 2021 (J Endod) Regenerative Endodontic Procedures for the Treatment of Necrotic Mature Teeth with Apical Periodontitis. A Systematic Review and Meta-analysis of Randomized Controlled Trials
    1.2. Wikström 2021 (Eur Arch Paediatr Dent): What is the best long-term treatment modality for immature permanent teeth with pulp necrosis and apical periodontitis?
    1.3. Fagogeni 2021 (J Clin Med.) Efficiency of Teeth Bleaching after Regenerative Endodontic Treatment: A Systematic Review.
    1.4. Babaki 2020 (Biomater Investig Dent) The effects of mineral trioxide aggregate on osteo/odontogenic potential of mesenchymal stem cells: a comprehensive and systematic literature review.
    1.5. Kharchi 2020 (Prim Dent J.) Regenerative Endodontic Procedures, Disinfectants and Outcomes: A Systematic Review
    1.6. Liu 2020 (Int Endod J.): Impact of different regenerative techniques and materials on the healing outcome of endodontic surgery: a systematic review and meta-analysis
    1.7. Panda 2020 (Cells) Effectiveness of Autologous Platelet Concentrates in Management of Young Immature Necrotic Permanent Teeth-A Systematic Review and Meta-Analysis.
    1.8. Ong 2020 (J Endod) Quantitative Assessment of Root Development after Regenerative Endodontic Therapy: A Systematic Review and Meta-Analysis.
    1.9. Joshi 2020 (J Int Soc Prev Community Dent.). Clinical Success of Platelet-rich Fibrin and Mineral Trioxide Aggregate (MTA) or MTA-like Agents in Healing of Periapical Lesion in Nonsurgically Treated Pulpless Immature Permanent Teeth: A Systematic Review.
    1.10. Rosaian 2020 (J Pharm Bioallied Sci.) Regenerative Capacity of Dental Pulp Stem Cells: A Systematic Review.
    1.11. Alghamdi 2020 (ScientificWorldJournal) Regenerative Endodontic Therapy in the Management of Immature Necrotic Permanent Dentition: A Systematic Review.
    1.12. Sanz 2020 (Materials) Viability and Stimulation of Human Stem Cells from the Apical Papilla (hSCAPs) Induced by Silicate-Based Materials for Their Potential Use in Regenerative Endodontics: A Systematic Review.
    1.13. Kok 2020 (J Evid Based Dent Pract): Does the etiology of pulp necrosis affect regenerative endodontic treatment outcomes? a systematic review and meta-analyses.
    1.14. Taylor 2020 (Int J Paediatr Dent.) Success of endodontic management of compromised first permanent molars in children: A systematic review
    1.15. Digka 2020 (Aust Endod J) Histological assessment of human regenerative endodontic procedures (TER) of immature permanent teeth with necrotic pulp/apical periodontitis: A systematic review.
    1.16. Almutairi 2019 (J endod) Regenerative Endodontics: A Systematic Analysis of the Failed Cases
    1.17. Chisini 2019 (Braz Dent) Bone, Periodontal and Dental Pulp Regeneration in Dentistry: A Systematic Scoping Review.
    1.18. Shamszadeh 2019 (J Endod.): Regenerative Endodontics: A Scientometric and Bibliometric Analysis
    1.19. Metlerska 2019 (J endod). Efficacy of Autologous Platelet Concentrates in Regenerative Endodontic Treatment: A Systematic Review of Human Studies.
    1.20. Bakhtiar 2018 (Prog Biomater) The role of stem cell therapy in regeneration of dentine-pulp complex: a systematic review.
    1.21. Eramo 2018 (Int Endod J): Dental pulp regeneration via cell homing.
    1.22. Santos 2018 (Braz Dent J.): Alternative to Avoid Tooth Discoloration after Regenerative Endodontic Procedure: A Systematic Review.
    1.23. He 2017 (Sci Rep.) Treatment of Necrotic Teeth by Apical Revascularization: Meta-analysis.
    1.24. Verma 2017 (J Int Soc Prev Community Dent.)Platelet-rich Fibrin: A Paradigm in Periodontal Therapy - A Systematic Review.
    1.25. Torabinejad 2017 (J Endod): Regenerative endodontic treatment or Mineral Trioxide Aggregate Apical Plug in Teeth with Necrotic Pulps and Open Apices: a systematic review and meta-analysis.
    1.26. Tong 2017 (J Endod.): Regenerative Endodontic Therapy in the Management of Nonvital Immature Permanent Teeth: A Systematic Review-Outcome Evaluation and Meta-analysis.
    1.27. Duggal 2017 (Eur Arch Paediatr Dent): Interventions for the endodontic management of non-vital traumatised immature permanent anterior teeth in children and adolescents: a systematic review of the evidence and guidelines of the European Academy of Paediatric Dentistry.
    1.28. Kahler 2017 (J Endod.) An Evidence-based Review of the Efficacy of Treatment Approaches for Immature Permanent Teeth with Pulp Necrosis.

1.29. Altaii 2017 (Dent Traumatol) Histological assessment of regenerative endodontic treatment in animal studies with different scaffolds: A systematic review.
1.30. Ramanauskaite 2016 (Implant Dent.) Apical/Retrograde Periimplantitis/Implant Periapical Lesion: Etiology, Risk Factors, and Treatment Options: A Systematic Review.
1.31. Meschi 2016 (Platelets.) The impact of autologous platelet concentrates on endodontic healing: a systematic review.
1.32. Kahler 2016 (J Endod.) A Review of Tooth Discoloration after Regenerative Endodontic Therapy.

2. SECOND SEARCH - SYSTEMATIC REVIEWS: (((necrotic) AND (pulp)) AND (open)) AND (apex) - 4 results- PUBMED
   2.1. Guerrero 2018 (J Conserv Dent) Apexification: A systematic review.
   2.2. Altaii 2017 (Dent Traumatol) Histological assessment of regenerative endodontic treatment in animal studies with different scaffolds: A systematic review. **DUPLICATED.**
   2.3. Torabinejad 2017 (J Endod): Regenerative endodontic treatment or Mineral Trioxide Aggregate Apical Plug in Teeth with Necrotic Pulps and Open Apices: a systematic review and meta-analysis. **DUPLICATED.**
   2.4. Lin 2016 (J. Formos Med Assoc) Comparison of mineral trioxide aggregate and calcium hydroxide for apexification of immature permanent teeth: A systematic review and meta-analysis.

3. THIRD SEARCH- SYSTEMATIC REVIEWS: (pulp) AND (revascularization OR revitalization OR repair OR regeneration) - 56 results - PUBMED
   3.1. Wikström 2021 (Eur Arch Paediatr Dent): What is the best long-term treatment modality for immature permanent teeth with pulp necrosis and apical periodontitis? **DUPLICATED.**
   3.2. Bouhlouli 2020 (Curr Stem Cell Res Ther.) Various Cell Therapy Approaches for Bone Diseases in the Controlled Clinical Trials: A Systematic Review and Meta-analysis study.
   3.3. Hosmani 2020 (World J Stem Cells.) Proteomic profiling of various human dental stem cells - a systematic review.
   3.4. Panda 2020 (Cells) Effectiveness of Autologous Platelet Concentrates in Management of Young Immature Necrotic Permanent Teeth-A Systematic Review and Meta-Analysis. **DUPLICATED.**
   3.5. Coll 2020 (Pediatr Dent.) Use of Non-Vital Pulp Therapies in Primary Teeth.
   3.6. Ong 2020 (J Endod) Quantitative Assessment of Root Development after Regenerative Endodontic Therapy: A Systematic Review and Meta-Analysis. **DUPLICATED.**
   3.7. Joshi 2020 (J Int Soc Prev Community Dent.). Clinical Success of Platelet-rich Fibrin and Mineral Trioxide Aggregate (MTA) or MTA-like Agents in Healing of Periapical Lesion in Nonsurgically Treated Pulpless Immature Permanent Teeth: A Systematic Review. **DUPLICATED.**
   3.8. Coll 2020 (Pediatr Dent.) A Systematic Review and Meta-Analysis of Nonvital Pulp Therapy for Primary Teeth.
   3.9. da Silva 2020 (Regen Med.) Current evidence of tissue engineering for dentine regeneration in animal models: a systematic review.
   3.10. Kok 2020 (J Evid Based Dent Pract): Does the etiology of pulp necrosis affect regenerative endodontic treatment outcomes? a systematic review and meta-analyses. **DUPLICATED.**
   3.11. Fernandes 2020 (Tissue Eng Part B Rev.) Systematic Review of Human Dental Pulp Stem Cells for Cartilage Regeneration.
   3.12. Fornaini 2019 (Photobiomodul Photomed Laser Surg.) Photobiomodulation in Pediatric Dentistry: A Current State-of-the-Art.
   3.13. Mahgoub 2019 (J Int Soc Prev Community Dent.) Comparison between iRoot BP Plus (EndoSequence Root Repair Material) and Mineral Trioxide Aggregate as Pulp-capping Agents: A Systematic Review.
   3.14. Rossi-Fedele 2019 (Braz Dent J): Limited Evidence Suggests Benefits of Single Visit Revascularization Endodontic Procedures - A Systematic Review.
   3.15. Rossi-Fedele 2020 (Aust Endod J.) Endodontic complications associated with orthodontic temporary anchorage devices: A systematic review of human studies.
   3.16. Do Couto 2019 (Pediatr Dent.) A Systematic Review of Pulp Revascularization Using a Triple Antibiotic Paste.

3.17. Digka 2020 (Aust Endod J) Histological assessment of human regenerative endodontic procedures (TER) of immature permanent teeth with necrotic pulp/apical periodontitis: A systematic review. **DUPLICATED.**
3.18. Fawzy El-Sayed 2019 (Int Endod J.) Stem/progenitor cell-mediated pulpal tissue regeneration: a systematic review and meta-analysis.
3.19. Hosoya 2019 (Dent Mater J.) A review of the literature on the efficacy of mineral trioxide aggregate in conservative dentistry.
3.20. Amghar-Maach 2019 (J Clin Exp Dent.) Regeneration of periodontal bone defects with dental pulp stem cells grafting: Systematic Review.
3.21. Sanz 2019 (Materials (Basel)) Bioactivity of Bioceramic Materials Used in the Dentin-Pulp Complex Therapy: A Systematic Review. .
3.22. Chisini 2019 (Braz Dent) Bone, Periodontal and Dental Pulp Regeneration in Dentistry: A Systematic Scoping Review. **DUPLICATED.**
3.23. Shamszadeh 2019 (J Endod.): Regenerative Endodontics: A Scientometric and Bibliometric Analysis **DUPLICATED.**
3.24. Tziafas 2019 (J Endod.) Characterization of Odontoblast-like Cell Phenotype and Reparative Dentin Formation In Vivo: A Comprehensive Literature Review.
3.25. Hamed 2019 (J Long Term Eff Med Implants.) Concerns Regarding Dentition and Connections to Osseointegrated Implants: A Systematic Review of Implant Restoration Trends and Treatment of Partial Edentulism.
3.26. Nicoloso 2019 (J Clin Pediatr Dent): Pulp Revascularization or Apexification for the Treatment of Immature Necrotic Permanent Teeth: Systematic Review and Meta-Analysis.
3.27. Fukushima 2019 (Arch Oral Biol.) Screening of hydrogel-based scaffolds for dental pulp regeneration-A systematic review.
3.28. Metlerska 2019 (J Endod.) Efficacy of Autologous Platelet Concentrates in Regenerative Endodontic Treatment: A Systematic Review of Human Studies.
3.29. Bakhtiar 2018 (Prog Biomater.) The role of stem cell therapy in regeneration of dentine-pulp complex: a systematic review. **DUPLICATED.**
3.30. Gadallah 2018 (F1000Res) Pulpotomy versus pulpectomy in the treatment of vital pulp exposure in primary incisors. A systematic review and meta-analysis.
3.31. Boutsiouki 2018 (Eur Arch Paediatr Dent.) Relative effectiveness of direct and indirect pulp capping in the primary dentition.
3.32. Mahmoud 2018 (J Conserv Dent.) Biodentine versus mineral trioxide aggregate as a direct pulp capping material for human mature permanent teeth - A systematic review.
3.33. Guerrero 2018 (J Conserv Dent) Apexification: A systematic review. **DUPLICATED.**
3.34. Emara 2018 (J Dent.) Effects of calcium silicate cements on dental pulp cells: A systematic review.
3.35. Gaubys 2018 (J Oral Maxillofac Res.) Use of Autologous Stem Cells for the Regeneration of Periodontal Defects in Animal Studies: a Systematic Review and Meta-Analysis.
3.36. de Oliveira 2018 (Eur J Dent.) Comparison of the biocompatibility of calcium silicate-based materials to mineral trioxide aggregate: Systematic review.
3.37. Paula 2018 (J Evid Based Dent Pract.) Pulp Capping: What is the Most Effective Therapy?-Systematic Review and Meta-Analysis.
3.38. Leyendecker 2018 (J Tissue Eng.) The use of human dental pulp stem cells for in vivo bone tissue engineering: A systematic review.
3.39. Gintautaitė 2018 (Stomatologija.) Dental roots' and surrounding structures' response after contact with orthodontic mini implants: A systematic literature review.
3.40. Eramo 2018 (Int Endod J): Dental pulp regeneration via cell homing. **DUPLICATED.**
3.41. He 2017 (Sci Rep.) Treatment of Necrotic Teeth by Apical Revascularization: Meta-analysis. **DUPLICATED.**
3.42. Borges 2017 (J Endod.) Evaluation of Effect of Foraminal Enlargement of Necrotic Teeth on Postoperative Symptoms: A Systematic Review and Meta-analysis.
3.43. Avinash 2017 (Int J Stem Cells.) Methods of Isolation and Characterization of Stem Cells from Different Regions of Oral Cavity Using Markers: A Systematic Review.
3.44. Zanini 2017 (J Endod.) Pulp Inflammation Diagnosis from Clinical to Inflammatory Mediators: A Systematic Review.
3.45. Kahler 2017 (J Endod.) An Evidence-based Review of the Efficacy of Treatment Approaches for Immature Permanent Teeth with Pulp Necrosis. **DUPLICATED.**
3.46. Moreira 2017 (J Endod.) Endodontic Treatment in Single and Multiple Visits: An Overview of Systematic Reviews.
3.47. Altaii 2017 (Dent Traumatol) Histological assessment of regenerative endodontic treatment in animal studies with different scaffolds: A systematic review. **TRIPLICATED.**

3.48. Tassi 2017 (J Periodontal Res.) Efficacy of stem cells on periodontal regeneration: Systematic review of pre-clinical studies.
3.49. Luiz de Oliveira da Rosa 2017 (J Biomed Mater Res A.) Could the application of bioactive molecules improve vital pulp therapy success? A systematic review.
3.50. Nancarrow-Lei 2017 (Curr Stem Cell Res Ther.) A Systemic Review of Adult Mesenchymal Stem Cell Sources and their Multilineage Differentiation Potential Relevant to Musculoskeletal Tissue Repair and Regeneration.
3.51. Rechenberg 2016 (PLoS One) Biological Markers for Pulpal Inflammation: A Systematic Review.
3.52. Rathinam 2016 (J Endod.) Gene Expression Profiling and Molecular Signaling of Various Cells in Response to Tricalcium Silicate Cements: A Systematic Review.
3.53. Meschi 2016 (Platelets.) The impact of autologous platelet concentrates on endodontic healing: a systematic review. **DUPLICATED.**
3.54. Marques 2016 (Photomed Laser Surg.) Photobiomodulation of Dental Derived Mesenchymal Stem Cells: A Systematic Review.
3.55. Lolato 2016 (Platelets) Platelet concentrates for revitalization of immature necrotic teeth: a systematic review of the clinical studies.
3.56. Conde 2016 (Int Endod J.) Stem cell-based pulp tissue engineering: variables enrolled in translation from the bench to the bedside, a systematic review of literature.

4. FORTH SEARCH- SYSTEMATIC REVIEWS: (tissue engineering) AND (endodontics) -10 results- PUBMED
4.1. Babaki 2020 (Biomater Investig Dent) The effects of mineral trioxide aggregate on osteo/odontogenic potential of mesenchymal stem cells: a comprehensive and systematic literature review. **DUPLICATED.**
4.2. Rosaian 2020 (J Pharm Bioallied Sci.) Regenerative Capacity of Dental Pulp Stem Cells: A Systematic Review. **DUPLICATED.**
4.3. Fawzy El-Sayed 2019 (Int Endod J.) Stem/progenitor cell-mediated pulpal tissue regeneration: a systematic review and meta-analysis. **DUPLICATED.**
4.4. Li 2019 (Sci Rep.) Efficacy of Recombinant Human BMP2 and PDGF-BB in Orofacial Bone Regeneration: A Systematic Review and Meta-analysis.
4.5. Li 2019 (J Dent.) Pulpotomy for carious pulp exposures in permanent teeth: A systematic review and meta-analysis.
4.6. Bakhtiar 2018 (Prog Biomater.) The role of stem cell therapy in regeneration of dentine-pulp complex: a systematic review. **TRIPLICATED.**
4.7. Eramo 2017 (Int Endod J.) Dental pulp regeneration via cell homing. **TRIPLICATED.**
4.8. Verma 2017 (J Int Soc Prev Community Dent.)Platelet-rich Fibrin: A Paradigm in Periodontal Therapy - A Systematic Review. **DUPLICATED.**
4.9. Altaii 2017 (Dent Traumatol.) Histological assessment of regenerative endodontic treatment in animal studies with different scaffolds: A systematic review. **QUINTUPLICATED.**
4.10. Conde 2016 (Int Endod J.) Stem cell-based pulp tissue engineering: variables enrolled in translation from the bench to the bedside, a systematic review of literature. **DUPLICATED.**

5. FIFTH SEARCH- SYSTEMATIC REVIEWS: (stem cells OR scaffolds OR growth factor) AND (pulp) AND (tooth) - 11 results- PUBMED
5.1. Sanz 2020 (J Clin Med.) Cytocompatibility and Bioactive Properties of Hydraulic Calcium Silicate-Based Cements (HCSCs) on Stem Cells from Human Exfoliated Deciduous Teeth (SHEDs): A Systematic Review of In Vitro Studies.
5.2. Rosaian 2020 (J Pharm Bioallied Sci.) Regenerative Capacity of Dental Pulp Stem Cells: A Systematic Review. **TRIPLICATED.**
5.3. Kulkarni 2020 (Lasers Med Sci.) The effect of photobiomodulation on human dental pulp-derived stem cells: systematic review.
5.4. da Silva 2020 (Regen Med.) Current evidence of tissue engineering for dentine regeneration in animal models: a systematic review. **DUPLICATED.**
5.5. Kok 2020 (J Evid Based Dent Pract): Does the etiology of pulp necrosis affect regenerative endodontic treatment outcomes? a systematic review and meta-analyses. **TRIPLICATED.**
5.6. Fernandes 2020 (Tissue Eng Part B Rev.) Systematic Review of Human Dental Pulp Stem Cells for Cartilage Regeneration. **DUPLICATED.**
5.7. Chisini 2019 (Braz Dent) Bone, Periodontal and Dental Pulp Regeneration in Dentistry: A Systematic Scoping Review. **TRIPLICATED.**

5.8. Leyendecker 2018 (J Tissue Eng.) The use of human dental pulp stem cells for in vivo bone tissue engineering: A systematic review. **DUPLICATED.**
5.9. Avinash 2017 (Int J Stem Cells.) Methods of Isolation and Characterization of Stem Cells from Different Regions of Oral Cavity Using Markers: A Systematic Review. **DUPLICATED.**
5.10. Altaii 2017 (Dent Traumatol) Histological assessment of regenerative endodontic treatment in animal studies with different scaffolds: A systematic review. **QUADRUPLICATED.**
5.11. Conde 2016 (Int Endod J.) Stem cell-based pulp tissue engineering: variables enrolled in translation from the bench to the bedside, a systematic review of literature. **DUPLICATED.**

Filters applied to search systematic reviews in Pubmed: systematic reviews, meta-analysis, 5 years, full text. Last search for systematic reviews performed in Pubmed: 08/04/2021.

6. SIXTH SEARCH - RANDOMIZED CLINICAL TRIALS: ((regenerative) AND (endodontic)) AND (treatment OR therapy OR procedures OR technique) - 14 results - PUBMED
6.1. ElSheshtawy 2020 (Int Endod J.) The effect of platelet-rich plasma as a scaffold in regeneration/ revitalization endodontics of immature permanent teeth assessed using 2-dimensional radiographs and cone beam computed tomography: a randomized controlled trial. **EXCLUSION: population.**
6.2. **Brizuela 2020** (J Dent Res.). Cell-Based Regenerative Endodontics for Treatment of Periapical Lesions: A Randomized, Controlled Phase I/II Clinical Trial.
6.3. **El-Kateb 2020** (J Endod.) Quantitative Assessment of Intracanal Regenerated Tissues after Regenerative Endodontic Procedures in Mature Teeth Using Magnetic Resonance Imaging: A Randomized Controlled Clinical Trial.
6.4. Alsubait 2020 (BMC Oral Health) The effect of intracanal medicaments used in Endodontics on the dislocation resistance of two calcium silicate-based filling materials. **EXCLUSION: treatment.**
6.5. de-Figueiredo 2020 (PLoS One) Apical periodontitis healing and postoperative pain following endodontic treatment with a reciprocating single-file, single-cone approach: A randomized controlled pragmatic clinical trial. **EXCLUSION: treatment.**
6.6. **Arslan 2019** (J.Endod.) Regenerative Endodontic Procedures in Necrotic Mature Teeth with Periapical Radiolucencies: A Preliminary Randomized Clinical Study. Ulusoy 2019 (J Endod.) Evaluation of Blood Clot, Platelet-rich Plasma, Platelet-rich Fibrin, and Platelet Pellet as Scaffolds in Regenerative Endodontic Treatment: A Prospective Randomized Trial. **EXCLUSION: population.**
6.7. Arruda 2018 (J Endod.) Infection Control in Teeth with Apical Periodontitis Using a Triple Antibiotic Solution or Calcium Hydroxide with Chlorhexidine: A Randomized Clinical Trial. **EXCLUSION: treatment.**
6.8. Pradeep 2017 (J Periodontol.) Platelet-Rich Fibrin Combined With a Porous Hydroxyapatite Graft for the Treatment of 3-Wall Intrabony Defects in Chronic Periodontitis: A Randomized Controlled Clinical Trial. **EXCLUSION: treatment.**
6.9. Lee 2017 (Proc Natl Acad Sci USA) Clinical validation of a nanodiamond-embedded thermoplastic biomaterial. **EXCLUSION: treatment.**
6.10. Lin 2017 (J. Endod.) Regenerative Endodontics Versus Apexification in Immature Permanent Teeth with Apical Periodontitis: A Prospective Randomized Controlled Study. **EXCLUSION: population.**
6.11. Botero 2017 (J Endod.) Clinical Evidence for Regenerative Endodontic Procedures: Immediate versus Delayed Induction? **EXCLUSION: population.**
6.12. Jiang 2017 (J Endod.) Clinical and Radiographic Assessment of the Efficacy of a Collagen Membrane in Regenerative Endodontics: A Randomized, Controlled Clinical Trial. **EXCLUSION: population.**
6.13. Kim 2016 (J Endod.) A Randomized Controlled Study of Mineral Trioxide Aggregate and Super Ethoxybenzoic Acid as Root-end Filling Materials in Endodontic Microsurgery: Long-term Outcomes **EXCLUSION: treatment.**

7. SEVENTH SEARCH- RANDOMIZED CLINICAL TRIALS: (pulp) AND (revascularization OR revitalization OR Repair OR regeneration) - 20 results - PUBMED
7.1. Al-Hezaimi 2020 (Int J Periodontics Restorative Dent.) Regeneration of Secondary Dentin Using Recombinant Human Platelet-Derived Growth Factor and MTA for Pulp Capping: A Randomized Controlled Human Clinical Trial. **EXCLUSION: treatment.**
7.2. Yang 2020 (Dent Traumatol.) The effect of partial pulpotomy with iRoot BP Plus in traumatized immature permanent teeth: A randomized prospective controlled trial. **EXCLUSION: treatment.**
7.3. ElSheshtawy 2020 (Int Endod j.) The effect of platelet-rich plasma as a scaffold in regeneration/ revitalization endodontics of immature permanent teeth assessed using 2-dimensional radiographs and cone beam computed tomography: a randomized controlled trial **DUPLICATED.**

7.4. Brizuela 2020 (J Dent Res.). Cell-Based Regenerative Endodontics for Treatment of Periapical Lesions: A Randomized, Controlled Phase I/II Clinical Trial. **DUPLICATED.**
7.5. El-Kateb 2020 (J Endod.) Quantitative Assessment of Intracanal Regenerated Tissues after Regenerative Endodontic Procedures in Mature Teeth Using Magnetic Resonance Imaging: A Randomized Controlled Clinical Trial. **DUPLICATED.**
7.6. Arslan 2019 (J Endod.) Regenerative Endodontic Procedures in Necrotic Mature Teeth with Periapical Radiolucencies: A Preliminary Randomized Clinical Study. **DUPLICATED.**
7.7. Zacharczuk 2019 (Acta Odontol Latinoam.) Evaluation of 3Mix-MP and pulpectomies in non-vital primary molars. **EXCLUSION: treatment.**
7.8. Verma 2019 (J Endod.) Effect of Different Concentrations of Sodium Hypochlorite on Outcome of Primary Root Canal Treatment: A Randomized Controlled Trial. **EXCLUSION: treatment.**
7.9. Aly 2019 (Int J Paediatr Dent.) Clinical and radiographic evaluation of Biodentine and Mineral Trioxide Aggregate in revascularization of non-vital immature permanent anterior teeth (randomized clinical study). **EXCLUSION: treatment.**
7.10. Ragab 2019 (J Clin Pediatr Dent.) Comparative Study between Revitalization of Necrotic Immature Permanent Anterior Teeth with and without Platelet Rich Fibrin: A Randomized Controlled Trial. **EXCLUSION: population.**
7.11. Pacheco 2018 (Int J Exp Pathol.) Nitrogen-containing bisphosphonate therapy-Part II: Assessment of alveolar bone tissue inflammatory response in rats-A blind randomized controlled trial. **EXCLUSION: treatment.**
7.12. Xuan 2018 (Sci Transl Med.) Deciduous autologous tooth stem cells regenerate dental pulp after implantation into injured teeth. **EXCLUSION: population.**
7.13. Barbier 2018 (Med Oral Patol Oral Cir Bucal.) Autologous dental pulp mesenchymal stem cells for inferior third molar post-extraction socket healing: A split-mouth randomised clinical trial. **EXCLUSION: treatment.**
7.14. Ferrarotti 2018 (J Clin Periodontol.) Human intrabony defect regeneration with micrografts containing dental pulp stem cells: A randomized controlled clinical trial. **EXCLUSION: treatment.**
7.15. Carti 2017 (Niger J Clin Pract.) Evaluation and comparison of mineral trioxide aggregate and biodentine in primary tooth pulpotomy: Clinical and radiographic study. **EXCLUSION: treatment.**
7.16. Botero 2017 (J Endod.) Clinical Evidence for Regenerative Endodontic Procedures: Immediate versus Delayed Induction? **DUPLICATED.**
7.17. Lin 2017 (J. Endod.) Regenerative Endodontics Versus Apexification in Immature Permanent Teeth with Apical Periodontitis: A Prospective Randomized Controlled Study. **DUPLICATED.**
7.18. Jiang 2017 (J Endod.) Clinical and Radiographic Assessment of the Efficacy of a Collagen Membrane in Regenerative Endodontics: A Randomized, Controlled Clinical Trial. **DUPLICATED.**
7.19. Hesse 2016 (Trials.) Atraumatic Restorative Treatment compared to the Hall Technique for occluso-proximal cavities in primary molars: study protocol for a randomized controlled trial. **EXCLUSION: treatment.**
7.20. Cuadros-Fernández 2016 (Clin Oral Investig.) Short-term treatment outcome of pulpotomies in primary molars using mineral trioxide aggregate and Biodentine: a randomized clinical trial. **EXCLUSION: treatment.**

8. EIGHTH SEARCH - RANDOMIZED CLINICAL TRIALS: (tissue engineering) AND (endodontics) - 3 results-PUBMED
8.1. Hashem 2019 (Clin Oral Investig.) Evaluation of the efficacy of calcium silicate vs. glass ionomer cement indirect pulp capping and restoration assessment criteria: a randomised controlled clinical trial-2-year results. **EXCLUSION: treatment.**
8.2. Ali 2018 (J Dent Res.) Self-Limiting versus Conventional Caries Removal: A Randomized Clinical Trial. **EXCLUSION: treatment.**
8.3. Lin 2017 (J Endod.) Regenerative Endodontics Versus Apexification in Immature Permanent Teeth with Apical Periodontitis: A Prospective Randomized Controlled Study. **TRIPLICATED.**

9. NINTH SEARCH - RANDOMIZED CLINICAL TRIALS: (stem cells OR scaffolds OR growth factor) AND (pulp) AND (tooth) - 13 results -PUBMED
9.1. Al-Hezaimi2020 (Int J Periodontics Restorative Dent.) Evaluation of Recombinant Human Platelet-Derived Growth Factor or Enamel Matrix Derivative Plus Calcium Hydroxide for Pulp Capping: A Randomized Controlled Human Clinical Trial. **EXCLUSION: treatment.**

9.2. Al-Hezaimi 2020 (Int J Periodontics Restorative Dent.) Regeneration of Secondary Dentin Using Recombinant Human Platelet-Derived Growth Factor and MTA for Pulp Capping: A Randomized Controlled Human Clinical Trial. **DUPLICATED.**
9.3. ElSheshtawy 2020 (Int Endod j.) The effect of platelet-rich plasma as a scaffold in regeneration/ revitalization endodontics of immature permanent teeth assessed using 2-dimensional radiographs and cone beam computed tomography: a randomized controlled trial **TRIPLICATED.**
9.4. Brizuela 2020 (J Dent Res.). Cell-Based Regenerative Endodontics for Treatment of Periapical Lesions: A Randomized, Controlled Phase I/II Clinical Trial. **TRIPLICATED.**
9.5. Bamini 2020 (Aust Endod J.) Influence of anti-inflammatory irrigant on substance P expression for single-visit root canal treatment of teeth with irreversible pulpitis. **EXCLUSION: treatment.**
9.6. Ragab 2019 (J Clin Pediatr Dent.) Comparative Study between Revitalization of Necrotic Immature Permanent Anterior Teeth with and without Platelet Rich Fibrin: A Randomized Controlled Trial. **DUPLICATED.**
9.7. Barbosa-Ribeiro 2019 (Clin Oral Investig.) Effectiveness of calcium hydroxide-based intracanal medication on infectious/inflammatory contents in teeth with post-treatment apical periodontitis. **EXCLUSION: treatment.**
9.8. Xuan 2018 (Sci Transl Med.) Deciduous autologous tooth stem cells regenerate dental pulp after implantation into injured teeth. **DUPLICATED.**
9.9. Barbier 2018 (Med Oral Patol Oral Cir Bucal.) Autologous dental pulp mesenchymal stem cells for inferior third molar post-extraction socket healing: A split-mouth randomised clinical trial. **DUPLICATED.**
9.10. Ferrarotti 2018 (J Clin Periodontol.) Human intrabony defect regeneration with micrografts containing dental pulp stem cells: A randomized controlled clinical trial. **DUPLICATED.**
9.11. Krunić 2019 (Clin Oral Investig.) Clinical antibacterial effectiveness and biocompatibility of gaseous ozone after incomplete caries removal. **EXCLUSION: treatment.**
9.12. Jiang 2017 (J Endod.) Clinical and Radiographic Assessment of the Efficacy of a Collagen Membrane in Regenerative Endodontics: A Randomized, Controlled Clinical Trial. **TRIPLICATED.**
9.13. Nagpal 2016 (Int J Stroke.) TOOTH (The Open study Of dental pulp stem cell Therapy in Humans): Study protocol for evaluating safety and feasibility of autologous human adult dental pulp stem cell therapy in patients with chronic disability after stroke. **EXCLUSION: treatment.**

Filters applied to search randomized clinical trials in Pubmed: randomized controlled trial, 5 years, full text. Last search for randomized clinical trials performed in Pubmed: 08/04/2021.

10. TENTH SEARCH - CLINICAL TRIALS: ((regenerative) AND (endodontic)) AND (treatment OR therapy OR procedures OR technique)- 14 results - PUBMED.
10.1. ElSheshtawy 2020 (Int Endod J.) The effect of platelet-rich plasma as a scaffold in regeneration/ revitalization endodontics of immature permanent teeth assessed using 2-dimensional radiographs and cone beam computed tomography: a randomized controlled trial **QUADRUPLICATED.**
10.2. Brizuela 2020 (J Dent Res.). Cell-Based Regenerative Endodontics for Treatment of Periapical Lesions: A Randomized, Controlled Phase I/II Clinical Trial. **QUADRUPLICATED.**
10.3. El-Kateb 2020 (J Endod.) Quantitative Assessment of Intracanal Regenerated Tissues after Regenerative Endodontic Procedures in Mature Teeth Using Magnetic Resonance Imaging: A Randomized Controlled Clinical Trial. **TRIPLICATED.**
10.4. Alsubait 2020 (BMC Oral Health) The effect of intracanal medicaments used in Endodontics on the dislocation resistance of two calcium silicate-based filling materials. **DUPLICATED.**
10.5. de-Figueiredo 2020 (PLoS One) Apical periodontitis healing and postoperative pain following endodontic treatment with a reciprocating single-file, single-cone approach: A randomized controlled pragmatic clinical trial. **DUPLICATED.**
10.6. Arslan 2019 (J.Endod.) Regenerative Endodontic Procedures in Necrotic Mature Teeth with Periapical Radiolucencies: A Preliminary Randomized Clinical Study. **DUPLICATED.**
10.7. Ulusoy 2019 (J Endod.) Evaluation of Blood Clot, Platelet-rich Plasma, Platelet-rich Fibrin, and Platelet Pellet as Scaffolds in Regenerative Endodontic Treatment: A Prospective Randomized Trial. **DUPLICATED.**
10.8. Arruda 2018 (J Endod.) Infection Control in Teeth with Apical Periodontitis Using a Triple Antibiotic Solution or Calcium Hydroxide with Chlorhexidine: A Randomized Clinical Trial. **DUPLICATED.**
10.9. Pradeep 2017 (J Periodontol.) Platelet-Rich Fibrin Combined With a Porous Hydroxyapatite Graft for the Treatment of 3-Wall Intrabony Defects in Chronic Periodontitis: A Randomized Controlled Clinical Trial. **DUPLICATED.**
10.10. Lee 2017 (Proc Natl Acad Sci USA) Clinical validation of a nanodiamond-embedded thermoplastic biomaterial. **DUPLICATED.**

10.11. Botero 2017 (J Endod.) Clinical Evidence for Regenerative Endodontic Procedures: Immediate versus Delayed Induction? **DUPLICATED.**
10.12. Lin 2017 (J. Endod.) Regenerative Endodontics Versus Apexification in Immature Permanent Teeth with Apical Periodontitis: A Prospective Randomized Controlled Study. **QUADRUPLICATED.**
10.13. Jiang 2017 (J Endod.) Clinical and Radiographic Assessment of the Efficacy of a Collagen Membrane in Regenerative Endodontics: A Randomized, Controlled Clinical Trial. **QUADRUPLICATED.**
10.14. Kim 2016 (J Endod.) A Randomized Controlled Study of Mineral Trioxide Aggregate and Super Ethoxybenzoic Acid as Root-end Filling Materials in Endodontic Microsurgery: Long-term Outcomes **DUPLICATED.**

11. ELEVENTH SEARCH- CLINICAL TRIALS: (pulp) AND (revascularization OR revitalization OR repair OR regeneration) - 22 results - PUBMED.
    11.1. Al-Hezaimi 2020 (Int J Periodontics Restorative Dent.) Regeneration of Secondary Dentin Using Recombinant Human Platelet-Derived Growth Factor and MTA for Pulp Capping: A Randomized Controlled Human Clinical Trial. **TRIPLICATED.**
    11.2. Yang 2020 (Dent Traumatol.) The effect of partial pulpotomy with iRoot BP Plus in traumatized immature permanent teeth: A randomized prospective controlled trial. **DUPLICATED.**
    11.3. ElSheshtawy 2020 (Int Endod j.) The effect of platelet-rich plasma as a scaffold in regeneration/ revitalization endodontics of immature permanent teeth assessed using 2-dimensional radiographs and cone beam computed tomography: a randomized controlled trial **QUINTUPLICATED.**
    11.4. Brizuela 2020 (J Dent Res.). Cell-Based Regenerative Endodontics for Treatment of Periapical Lesions: A Randomized, Controlled Phase I/II Clinical Trial. **QUINTUPLICATED.**
    11.5. El-Kateb 2020 (J Endod.) Quantitative Assessment of Intracanal Regenerated Tissues after Regenerative Endodontic Procedures in Mature Teeth Using Magnetic Resonance Imaging: A Randomized Controlled Clinical Trial. **QUADRUPLICATED.**
    11.6. Arslan 2019 (J Endod.) Regenerative Endodontic Procedures in Necrotic Mature Teeth with Periapical Radiolucencies: A Preliminary Randomized Clinical Study. **TRIPLICATED.**
    11.7. Zacharczuk 2019 (Acta Odontol Latinoam.) Evaluation of 3Mix-MP and pulpectomies in non-vital primary molars. **DUPLICATED.**
    11.8. Verma 2019 (J Endod.) Effect of Different Concentrations of Sodium Hypochlorite on Outcome of Primary Root Canal Treatment: A Randomized Controlled Trial. **DUPLICATED.**
    11.9. Aly 2019 (Int J Paediatr Dent.) Clinical and radiographic evaluation of Biodentine and Mineral Trioxide Aggregate in revascularization of non-vital immature permanent anterior teeth (randomized clinical study). **DUPLICATED.**
    11.10. Ragab 2019 (J Clin Pediatr Dent.) Comparative Study between Revitalization of Necrotic Immature Permanent Anterior Teeth with and without Platelet Rich Fibrin: A Randomized Controlled Trial. **TRIPLICATED.**
    11.11. Pacheco 2018 (Int J Exp Pathol.) Nitrogen-containing bisphosphonate therapy-Part II: Assessment of alveolar bone tissue inflammatory response in rats-A blind randomized controlled trial. **EXCLUSION: treatment.**
    11.12. Xuan 2018 (Sci Transl Med.) Deciduous autologous tooth stem cells regenerate dental pulp after implantation into injured teeth. **TRIPLICATED.**
    11.13. Barbier 2018 (Med Oral Patol Oral Cir Bucal.) Autologous dental pulp mesenchymal stem cells for inferior third molar post-extraction socket healing: A split-mouth randomised clinical trial. **TRIPLICATED.**
    11.14. Hernández-Monjaraz 2018 (J Int Med Res.) Retrieval of a periodontally compromised tooth by allogeneic grafting of mesenchymal stem cells from dental pulp: A case report. **EXCLUSION: treatment.**
    11.15. Ferrarotti 2018 (J Clin Periodontol.) Human intrabony defect regeneration with micrografts containing dental pulp stem cells: A randomized controlled clinical trial. **TRIPLICATED.**
    11.16. Carti 2017 (Niger J Clin Pract.) Evaluation and comparison of mineral trioxide aggregate and biodentine in primary tooth pulpotomy: Clinical and radiographic study. **DUPLICATED.**
    11.17. Botero 2017 (J Endod.) Clinical Evidence for Regenerative Endodontic Procedures: Immediate versus Delayed Induction? **QUADRUPLICATED.**
    11.18. Lin 2017 (J Endod.) Regenerative Endodontics Versus Apexification in Immature Permanent Teeth with Apical Periodontitis: A Prospective Randomized Controlled Study. **QUINTUPLICATED.**
    11.19. Jiang 2017 (J Endod.) Clinical and Radiographic Assessment of the Efficacy of a Collagen Membrane in Regenerative Endodontics: A Randomized, Controlled Clinical Trial. **QUINTUPLICATED.**
    11.20. Chen 2016 (Ann Plast Surg.) Glabrous Flow-Through Flaps for Simultaneous Resurfacing, Revascularization, and Reinnervation of Digits. **EXCLUSION: treatment.**

11.21. Hesse 2016 (Trials.) Atraumatic Restorative Treatment compared to the Hall Technique for occluso-proximal cavities in primary molars: study protocol for a randomized controlled trial. **EXCLUSION: treatment.**
11.22. Cuadros-Fernández 2016 (Clin Oral Investig.) Short-term treatment outcome of pulpotomies in primary molars using mineral trioxide aggregate and Biodentine: a randomized clinical trial. **DUPLICATED.**

12. TWELFTH SEARCH - CLINICAL TRIALS: (tissue engineering) AND (endodontics) - 3 results- PUBMED
12.1. Hashem 2019 (Clin Oral Investig.) Evaluation of the efficacy of calcium silicate vs. glass ionomer cement indirect pulp capping and restoration assessment criteria: a randomised controlled clinical trial-2-year results. **DUPLICATED.**
12.2. Ali 2018 (J Dent Res.) Self-Limiting versus Conventional Caries Removal: A Randomized Clinical Trial. **DUPLICATED.**
12.3. Lin 2017 (J Endod.) Regenerative Endodontics Versus Apexification in Immature Permanent Teeth with Apical Periodontitis: A Prospective Randomized Controlled Study. **SEXTUPLICATED.**

13. THIRTEENTH SEARCH - CLINICAL TRIALS: (stem cells OR scaffolds OR growth factor) AND (pulp) AND (tooth) - 16 results -PUBMED
13.1. Al-Hezaimi 2020 (Int J Periodontics Restorative Dent.) Regeneration of Secondary Dentin Using Recombinant Human Platelet-Derived Growth Factor and MTA for Pulp Capping: A Randomized Controlled Human Clinical Trial. **QUADRUPLICATED.**
13.2. Al-Hezaimi2020 (Int J Periodontics Restorative Dent.) Evaluation of Recombinant Human Platelet-Derived Growth Factor or Enamel Matrix Derivative Plus Calcium Hydroxide for Pulp Capping: A Randomized Controlled Human Clinical Trial. **DUPLICATED.**
13.3. ElSheshtawy 2020 (Int Endod j.) The effect of platelet-rich plasma as a scaffold in regeneration/ revitalization endodontics of immature permanent teeth assessed using 2-dimensional radiographs and cone beam computed tomography: a randomized controlled trial. **SIX-FOLD.**
13.4. Brizuela 2020 (J Dent Res.). Cell-Based Regenerative Endodontics for Treatment of Periapical Lesions: A Randomized, Controlled Phase I/II Clinical Trial. **SIX-FOLD.**
13.5. Bamini 2020 (Aust Endod J.) Influence of anti-inflammatory irrigant on substance P expression for single-visit root canal treatment of teeth with irreversible pulpitis. **DUPLICATED.**
13.6. Kalyan 2019 (J Clin Pediatr Dent.) Preclinical Evaluation and Clinical Trial of Chlorhexidine Polymer Scaffold for Vital Pulp Therapy. **EXCLUSION: treatment.**
13.7. Ragab 2019 (J Clin Pediatr Dent.) Comparative Study between Revitalization of Necrotic Immature Permanent Anterior Teeth with and without Platelet Rich Fibrin: A Randomized Controlled Trial. **CUADRIPLICATED.**
13.8. Barbosa-Ribeiro 2019 (Clin Oral Investig.) Effectiveness of calcium hydroxide-based intracanal medication on infectious/inflammatory contents in teeth with post-treatment apical periodontitis. **DUPLICATED.**
13.9. Xuan 2018 (Sci Transl Med.) Deciduous autologous tooth stem cells regenerate dental pulp after implantation into injured teeth. **CUADRIPLICATED.**
13.10. Barbier 2018 (Med Oral Patol Oral Cir Bucal.) Autologous dental pulp mesenchymal stem cells for inferior third molar post-extraction socket healing: A split-mouth randomised clinical trial. **CUADRIPLICATED.**
13.11. Hernández-Monjaraz 2018 (J Int Med Res.) Retrieval of a periodontally compromised tooth by allogeneic grafting of mesenchymal stem cells from dental pulp: A case Report. **DUPLICATED.**
13.12. Ferrarotti 2018 (J Clin Periodontol.) Human intrabony defect regeneration with micrografts containing dental pulp stem cells: A randomized controlled clinical trial. **CUADRIPLICATED.**
13.13. Krunić 2019 (Clin Oral Investig.) Clinical antibacterial effectiveness and biocompatibility of gaseous ozone after incomplete caries removal. **EXCLUSION: treatment.**
13.14. Jiang 2017 (J Endod.) Clinical and Radiographic Assessment of the Efficacy of a Collagen Membrane in Regenerative Endodontics: A Randomized, Controlled Clinical Trial. **SIX-FOLD.**
13.15. Ballal 2017 (Caries Res.) MMP-9 in Dentinal Fluid Correlates with Caries Lesion Depth. **EXCLUSION: treatment.**
13.16. Nagpal 2016 (Int J Stroke.) TOOTH (The Open study Of dental pulp stem cell Therapy in Humans): Study protocol for evaluating safety and feasibility of autologous human adult dental pulp stem cell therapy in patients with chronic disability after stroke. **DUPLICATED.**

Filters applied to search clinical trials in Pubmed: clinical trial, 5 years, full text. Last search for clinical trials performed in Pubmed: 08/04/2021.

14. FOURTEENTH SEARCH - CASE REPORTS: ((regenerative) AND (endodontic)) AND (treatment OR therapy OR technique OR procedures) - 74 results- PUBMED.
    - 14.1. Wu 2021 (Lasers Surg Med.) Effect of Optimized Irrigation With Photon-Induced Photoacoustic Streaming on Smear Layer Removal, Dentin Microhardness, Attachment Morphology, and Survival of the Stem Cells of Apical Papilla. **EXCLUSION: treatment.**
    - 14.2. Bacci 2021 (TH Open.) Regenerative Surgery with Dental Implant Rehabilitation in a Haemophiliac Patient. **EXCLUSION: treatment.**
    - 14.3. Sethna 2020 (Contemp Clin Dent.) An Interdisciplinary Approach to the Management of a Young Patient with Generalized Periodontitis - A Case Report with a 3-Year Follow-up. **EXCLUSION: treatment.**
    - 14.4. **Arora 2020** (J Conserv Dent.). A 5 years' follow-up of root anatomy-based maturogenesis achieved in infected immature molars using regenerative techniques - A case series.
        - 14.4.1.Case 1. **EXCLUSION: population**. **Case 2.** Case 3. **EXCLUSION: population** Case 4. **EXCLUSION: population** Case 5. **EXCLUSION: population** Cases 6-9. **EXCLUSION: population.**
    - 14.5. El Backly 2020 (Clin Case Rep..) Multidisciplinary management of a fused maxillary incisor: Case Report with 5-year follow-up. **EXCLUSION: treatment.**
    - 14.6. Nawal 2020 (J Conserv Dent.) Long-term follow-up of traumatized immature necrotic permanent teeth treated with regenerative endodontic protocol using platelet-rich fibrin: A prospective case series. **EXCLUSION: population**.
    - 14.7. Maniglia-Ferreira 2020 (Braz Dent J.) 12-Year Follow-Up of Regenerative Endodontic Treatment of Immature Permanent Upper Incisors with Acute Abscess. **EXCLUSION: population**.
    - 14.8. Tripathi 2020 (Clin Cosmet Investig Dent.) Coronal Tooth Discoloration After the Use of White Mineral Trioxide Aggregate. **EXCLUSION: treatment.**
    - 14.9. Bandeira 2020 (Dent J (Basel)) Management of an Unsuccessful Regenerative Endodontic Procedure after Tooth Fracture: A Case Report. **EXCLUSION: population**.
    - 14.10. **Nivedhitha 2020** (Case Rep Dent.) Concentrated Growth Factor: A Novel Platelet Concentrate for Revascularization of Immature Permanent Teeth-A Report of Two Cases.
    - 14.11. Rajula 2020 (J Pharm Bioallied Sci.) Gingival Fenestration Management: A Rarefied Case Entity and Literature Review. **EXCLUSION: treatment.**
    - 14.12. Kavitha 2020 (Niger J Clin Pract.) Evaluation of healing by Cone Beam Computed Tomography (CBCT) using Platelet-Rich Plasma (PRP) + β -Tricalcium Phosphate (β -TCP) and Platelet Rich Fibrin (PRF) + β -Tricalcium Phosphate (β - TCP) in periapical lesions: Case Report. **EXCLUSION: treatment.**
    - 14.13. Viganò 2020 (Case Rep Dent.) B.P.F.C.® Bio-Plasma® with Pure Growth Factors (BioPlasma®) Used for the Treatment of a Persistent Great Periapical Lesion of an Endodontically Treated Tooth: A New Therapeutic Option. **EXCLUSION: treatment.**
    - 14.14. Lee 2020 (J Endod.) Combined Regenerative and Vital Pulp Therapies in an Immature Mandibular Molar: A Case Report. **EXCLUSION: population**.
    - 14.15. **Brizuela 2020** (J Endod.) Allogeneic Cellular Therapy in a Mature Tooth with Apical Periodontitis and Accidental Root Perforation: A Case Report.
    - 14.16. Lui 2020 (J Endod.) An Immunofluorescence Study to Analyze Wound Healing Outcomes of Regenerative Endodontics in an Immature Premolar with Chronic Apical Abscess. **EXCLUSION: population**.
    - 14.17. Goyal 2020 (J Indian Soc Periodontol.) Autologous platelet-rich derivatives along with alloplastic bone substitute in the management of complex perio-endo cases. **EXCLUSION: treatment.**
    - 14.18. Alasqah 2020 (Case Rep Dent.) Regenerative Endodontic Management of an Immature Molar Using Calcium Hydroxide and Triple Antibiotic Paste: a Two-Year Follow-Up. **EXCLUSION: population**.
    - 14.19. **Kandemir 2020** (J Clin Pediatr Dent.) Regenerative Endodontic Therapy with Platelet Rich Fibrin: Case Series
        - 14.19.1. **Case 1. Case 2. Case 3.**
    - 14.20. Ramezani 2019 (Clin Case Rep.) Revascularization and vital pulp therapy in immature molars with necrotic pulp and irreversible pulpitis: A case Report with two-year follow-up. **EXCLUSION: population**.
    - 14.21. Katwal 2019 (Clin Adv Periodontics.) Successful Multidisciplinary Management of an Endodontic-Periodontal Lesion Associated With a Palato-Radicular Groove: A Case Report. **EXCLUSION: treatment.**

14.22. **Arslan 2019** (J Endod.) Histologic Evaluation of Regenerated Tissues in the Pulp Spaces of Teeth with Mature Roots at the Time of the Regenerative Endodontic Procedures.
14.23. Abdel 2019 (F1000Res.) Case Report: Single visit photo-activated disinfection in regenerative endodontics. **EXCLUSION: population**.
14.24. Chaniotis 2019 (J Endod.) Cervical Level Biological Repair of the Access Opening after Regenerative Endodontic Procedures: Three Cases with the Same Repair Pattern. **EXCLUSION: population**.
14.25. Arango-Gómez 2019 (Restor Dent Endod.) Pulp revascularization with and without platelet-rich plasma in two anterior teeth with horizontal radicular fractures: a case Report. **EXCLUSION: population**.
14.26. **Antov 2019** (Int Endod J.) Management of discolouration following revitalization endodontic procedures: A case series.
    14.26.1. **Case 1.** Case 2. **EXCLUSION: population.** **Case 3.**
14.27. Corbella 2019 (Case Rep Dent.) Periodontal Regenerative Treatment of Intrabony Defects Associated with Palatal Grooves: A Report of Two Cases. **EXCLUSION: treatment.**
14.28. Meschi 2019 (J Endod.) Regenerative Endodontic Procedures Posttrauma: Immunohistologic Analysis of a Retrospective Series of Failed Cases. **EXCLUSION: population**.
14.29. Pilloni 2019 (Clin Adv Periodontics.) Surgical Treatment of a Cemental Tear-Associated Bony Defect Using Hyaluronic Acid and a Resorbable Collagen Membrane: A 2-Year Follow-Up. **EXCLUSION: treatment.**
14.30. Meza 2019 (J Endod.) Personalized Cell Therapy for Pulpitis Using Autologous Dental Pulp Stem Cells and Leukocyte Platelet-rich Fibrin: A Case Report. **EXCLUSION: without periapical pathology.**
14.31. Carranza 2019 (Clin Adv Periodontics.) Treatment of an Advanced Gingival Recession Involving the Apex of the Tooth: Periodontal Plastic, Endodontic Surgical Approach With a Laterally Stretched Flap and a Connective Tissue Graft. **EXCLUSION: treatment.**
14.32. Kavarthapu 2019 (Indian J Dent Res.) Management of periodontic-endodontic lesion in aggressive periodontitis-9 months follow-up: Report of a case. **EXCLUSION: treatment.**
14.33. Chawla 2019 (Indian J Dent Res.) Cemental tear: An unusual cause for persisting endodontic periodontal lesion. **EXCLUSION: treatment.**
14.34. Ajram 2019 (Dent J (Basel)) Management of an Immature Necrotic Permanent Molar with Apical Periodontitis Treated by Regenerative Endodontic Protocol Using Calcium Hydroxide and MM-MTA: A Case Report with Two Years Follow Up. **EXCLUSION: population**.
14.35. Austah 2018 (J Endod.) Comprehensive Characterization of 2 Immature Teeth Treated with Regenerative Endodontic Procedures. **EXCLUSION: population**.
14.36. Sharma 2018 (J Conserv Dent.) Combined endodontic therapy and peri-radicular regenerative surgery in the treatment of dens invaginatus type III associated with apicomarginal defect. **EXCLUSION: treatment.**
14.37. **Adhikari 2018** (J Conserv Dent.) report of a case of platelet-rich fibrin-mediated revascularization of immature 12 with histopathological evaluation.
14.38. Kahler 2018 (J Endod.) Revascularization-associated Intracanal Calcification: A Case Report with an 8-year Review. **EXCLUSION: population**.
14.39. Dhiman 2018 (Contemp Clin Dent.) Retrieval of Extruded Mineral Trioxide Aggregate Using a Novel Suction Device. **EXCLUSION: treatment.**
14.40. **Suresh 2018** (Dent J (Basel)) Successful Regenerative Endodontic Procedure of a Nonvital Immature Permanent Central Incisor Using Amniotic Membrane as a Novel Scaffold.
14.41. Jawad 2018 (J Orthod.) Orthodontic management of a non-vital immature tooth treated with regenerative endodontics: a case Report. **EXCLUSION: treatment.**
14.42. Shetty 2018 (J Investig Clin Dent.) Cone-beam computed tomographic and histological investigation of regenerative endodontic procedure in an immature mandibular second premolar with chronic apical abscess. **EXCLUSION: population**.
14.43. **Nagas 2018** (Restor Dent Endod.) Revitalization of necrotic mature permanent incisors with apical periodontitis: a case Report.
14.44. Sockalingam 2018 (Case Rep Dent.) Maturogenesis of an Immature Dens Evaginatus Nonvital Premolar with an Apically Placed Bioceramic Material (EndoSequence Root Repair Material®): An Unexpected Finding. **EXCLUSION: treatment.**
14.45. Bassetti 2018 (Swiss Dent J.) Regenerative endodontische Therapie nach Frontzahntrauma. Ein Fallbericht [Regenerative endodontics after front tooth trauma. A case Report]. **EXCLUSION: population**.
14.46. Natera 2018 (J Endod.) Regenerative Endodontic Treatment with Orthodontic Treatment in a Tooth with Dens Evaginatus: A Case Report with a 4-year Follow-up. **EXCLUSION: population**.
14.47. Asgary 2018 (Iran Endod J.) Surgical Endodontics *vs* Regenerative Periodontal Surgery for Management of a Large Periradicular Lesion. **EXCLUSION: treatment.**

14.48. Xu 2018 (Case Rep Dent.) Regenerative Endodontic Treatment of a Maxillary Mature Premolar. **EXCLUSIÓN: without periapical pathology.**
14.49. Lin 2018 (Aust Endod J.) Continued root maturation despite persistent apical periodontitis of immature permanent teeth after failed regenerative endodontic therapy. **EXCLUSION: population**.
14.50. Chaniotis 2018 (J Endod.) Orthodontic Movement after Regenerative Endodontic Procedure: Case Report and Long-term Observations. **EXCLUSION: population**.
14.51. Tzanetakis 2018 (J Endod.) Management of Intruded Immature Maxillary Central Incisor with Pulp Necrosis and Severe External Resorption by Regenerative Approach. **EXCLUSION: population**.
14.52. Timmerman 2018 (J Endod.) Bleaching of a Discolored Tooth with Retrieval of Remnants after Successful Regenerative Endodontics. **EXCLUSION: population**.
14.53. **Pinto 2017** (J Endod.) An Innovative Regenerative Endodontic Procedure Using Leukocyte and Platelet-rich Fibrin Associated with Apical Surgery: A Case Report.
14.54. Veeramachaneni 2017 (J Conserv Dent.) Use of bovine colostrum in periapical defects following surgical endodontics: Two case Reports. **EXCLUSION: treatment.**
14.55. Yu 2018 (J Cell Mol Med.) A novel mutation of adenomatous polyposis coli (APC) gene results in the formation of supernumerary teeth. **EXCLUSION: treatment.**
14.56. Chaniotis 2017 (J Endod.) Treatment Options for Failing Regenerative Endodontic Procedures: Report of 3 Cases. **EXCLUSION: population.**
14.57. Al Attas 2017 (J Taibah Univ Med Sci.) Multidisciplinary management of concomitant pulpal and periodontal lesion: A case Report. **EXCLUSION: treatment.**
14.58. **Gaviño 2017** (J Endod.) Use of Platelet-rich Plasma in Endodontic Procedures in Adults: Regeneration or Repair? A Report of 3 Cases with 5 Years of Follow-up
    14.58.1. **Case 1. Case 2. Case 3.**
14.59. Satheesh 2017 (J Clin Diagn Res.) Surgical Management of a Separated Endodontic Instrument using Second Generation Platelet Concentrate and Hydroxyapatite. **EXCLUSION: treatment.**
14.60. Kaval 2017 (Int Endod J.) Regenerative endodontic treatment of perforated internal root resorption: a case Report. **EXCLUSION: treatment.**
14.61. Maniglia-Ferreira 2017 (J Endod.) Intentional Replantation of an Avulsed Immature Permanent Incisor: A Case Report. **EXCLUSION: treatment.**
14.62. Kumar 2017 (J Indian Soc Periodontol.) Use of an amniotic membrane as a novel barrier in a tooth with a questionable prognosis. **EXCLUSION: treatment.**
14.63. Bröseler 2017 (J Clin Periodontol.) Long-term results of periodontal regenerative therapy: A retrospective practice-based cohort study. **EXCLUSION: treatment.**
14.64. D'Mello 2017 (Aust Dent J.) Management of coronal discolouration following a regenerative endodontic procedure in a maxillary incisor. **EXCLUSION: population**.
14.65. **Bakhtiar 2017** (J Endod.) Second-generation Platelet Concentrate (Platelet-rich Fibrin) as a Scaffold in Regenerative Endodontics: A Case Series.
    14.65.1. Case 1. **EXCLUSION: population.** **Case 2.** Case 3. **EXCLUSION: population.** Case 4. **EXCLUSION: population.**
14.66. Dhaimy 2017 (Case Rep Dent.) Pulpo-Periodontal Regeneration: Management of Partial Failure Revascularization. **EXCLUSION: treatment.**
14.67. Schmoeckel 2017 (Quintessence Int.) Management of an immature, partially necrotic permanent molar by pulp revascularization: Two-year follow-up. **EXCLUSION: population**.
14.68. Subash 2016 (J Clin Diagn Res.) Revitalization of an Immature Permanent Mandibular Molar with a Necrotic Pulp Using Platelet-Rich Fibrin: A Case Report. **EXCLUSION: population**.
14.69. Chung 2016 (Int J Periodontics Restorative Dent.) Saving an Integrating Implant Involved with Endodontic Implant Pathology Using Surgical Treatment. **EXCLUSION: treatment.**
14.70. **Al-Tammami 2017** (Restor Dent Endod.) Retreatment of failed regenerative endodontic of orthodontically treated immature permanent maxillary central incisor: a case Report.
14.71. Rafiee 2016 (Dent Res J (Isfahan)) A case-Report of delayed TERositioning of intruded permanent maxillary central incisors accompanied by complicated crown fractures: A 2-year follow-up. **EXCLUSION: treatment.**
14.72. **Saoud 2016** (J Endod.) Regenerative Endodontic Procedures for Traumatized Teeth after Horizontal Root Fracture, Avulsion, and Perforating Root Resorption.
    14.72.1. Case 1. **EXCLUSION**: **population**. **Case 2**.
14.73. Topçuoğlu 2016 (J Endod.) Regenerative Endodontic Therapy in a Single Visit Using Platelet-rich Plasma and Biodentine in Necrotic and Asymptomatic Immature Molar Teeth: A Report of 3 Cases. **EXCLUSION: population**.
14.74. Sooratgar 2016 (Iran Endod J.) Management of an Endodontic-Periodontal Lesion in a Maxillary Lateral Incisor with Palatal Radicular Groove: A Case Report. **EXCLUSION: treatment.**

15. FIFTEENTH SEARCH- CASE REPORTS: (((necrotic) AND (pulp)) AND (open)) AND (apex) - 22 results- PUBMED.
    15.1. Lee 2020 (BMC Oral Health.) Treatment of peri-invagination lesion and vitality preservation in an immature type III dens invaginatus: a case Report. **EXCLUSION: treatment.**
    15.2. **Nagaveni 2020** (Int J Clin Pediatr Dent.) A Comparative Evaluation of Revascularization Done in Traumatized Immature, Necrotic Anterior Teeth with and without Platelet-rich Fibrin: A Case Report.
    15.3. Abdel 2019 (F1000Res.) Case Report: Single visit photo-activated disinfection in regenerative endodontics. **DUPLICATED.**
    15.4. Nagaveni 2019 (Int J Clin Pediatr Dent.) Revascularization of a Nonvital, Immature Permanent Tooth Using Amniotic Membrane: A Novel Approach. **EXCLUSION: population.**
    15.5. **Aunmeungtong 2018** (Eur Endod J.) Endodontic Management of a Chronic Periapical Abscess in a Maxillary Central Incisor with an Immature Root Apex Using Platelet-Rich Fibrin: A Case Report.
    15.6. Dhiman 2018 (Contemp Clin Dent.) Retrieval of Extruded Mineral Trioxide Aggregate Using a Novel Suction Device. **DUPLICATED.**
    15.7. Fonzar 2018 (Ann Anat.) . Induced post-traumatic apexification: 20 year follow-up and morphological study after new fracture. **EXCLUSION: treatment.**
    15.8. **Plascencia 2017** (Iran Endod J.) Non-Surgical Endodontic Management of Type II Dens Invaginatus with Closed and Open Apex.
        15.8.1.Case 1. **EXCLUSION: treatment. Case 2.**
    15.9. Norouzi 2017 (Iran Endod J.) Nonsurgical Management of an Immature Maxillary Central Incisor with Type III Dens Invaginatus Using MTA Plug: A Case Report. **EXCLUSION: treatment.**
    15.10. Chaniotis 2017 (J Endod.) Treatment Options for Failing Regenerative Endodontic Procedures: Report of 3 Cases. **DUPLICATED.**
    15.11. Goel 2017 (J Endod.) Management of Dens Invaginatus Type II Associated with Immature Apex and Large Periradicular Lesion Using Platelet-rich Fibrin and Biodentine. **EXCLUSION: treatment.**
    15.12. Mehrvarzfar 2017 (J Int Soc Prev Community Dent.) Modified Revascularization in Human Teeth Using an Intracanal Formation of Treated Dentin Matrix: A Report of Two Cases. **EXCLUSION: population.**
    15.13. Abazarpour 2017 (Iran Endod J.) Successful Ultra-Conservative Management of a Mandibular Premolar with Dens Invaginatus. **EXCLUSION: treatment.**
    15.14. Gaviño 2017 (J Endod.) Use of Platelet-rich Plasma in Endodontic Procedures in Adults: Regeneration or Repair? A Report of 3 Cases with 5 Years of Follow-up **DUPLICATED.**
    15.15. Maniglia-Ferreira 2017 (J Endod.) Intentional Replantation of an Avulsed Immature Permanent Incisor: A Case Report. **DUPLICATED.**
    15.16. **Prasad 2017** (J Dent Res Dent Clin Dent Prospects.) Allogeneic stem cells derived from human exfoliated deciduous teeth (SHED) for the management of periapical lesions in permanent teeth: Two case Reports of a novel biologic alternative treatment.
        15.16.1.**Case 1. Case 2**.
    15.17. Graziele 2017 (Iran Endod J.) Endodontic Management of Open Apex Teeth Using Lyophilized Collagen Sponge and MTA Cement: Report of Two Cases. **EXCLUSION: treatment.**
    15.18. Bakhtiar 2017 (J Endod.) Second-generation Platelet Concentrate (Platelet-rich Fibrin) as a Scaffold in Regenerative Endodontics: A Case Series. **DUPLICADO**
    15.19. Al-Tammami 2017 (Restor Dent Endod.) Retreatment of failed regenerative endodontic of orthodontically treated immature permanent maxillary central incisor: a case Report. **DUPLICADO**
    15.20. Subash 2016 (J Clin Diagn Res.) Revitalization of an Immature Permanent Mandibular Molar with a Necrotic Pulp Using Platelet-Rich Fibrin: A Case Report. **DUPLICADO**
    15.21. Jiang 2016 (Chin J Dent Res.) Partial Pulpotomy of Immature Teeth with Apical Periodontitis using Bioceramics and Mineral Trioxide Aggregate: A Report of Three Cases. **EXCLUSION: treatment.**
    15.22. Aldakak 2016 (Iran Endod J.) Single-Visit Pulp Revascularization of a Nonvital Immature Permanent Tooth Using Biodentine. **EXCLUSION: population.**

16. SIXTEENTH SEARCH - CASE REPORTS: (pulp) AND (revascularization OR Repair OR revitalization OR regeneration) - 86 results -PUBMED.
    16.1. Kusuhara 2021 (Plast Reconstr Surg Glob Open.) Third Toe Pulp Reconstruction Using the Contralateral Second Toe Hemi-pulp Free Flap. **EXCLUSION: treatment.**
    16.2. Chang 2021 (J Am Dent Assoc.) Spontaneous Repair of iatrogenic root perforation by an orthodontic miniscrew: A case Report. **EXCLUSION: treatment.**
    16.3. **Brogni 2020** (Aust Endod J.) A second attempt at pulp revascularisation on an immature traumatised anterior tooth: a case Report with two-year follow-up.

16.4. Krug 2020 (Head Face Med.) Guided endodontic treatment of multiple teeth with dentin dysplasia: a case Report. **EXCLUSION: treatment.**
16.5. Arnold 2021 (J Endod.) Reparative Endodontic Treatment of a Perforating Internal Inflammatory Root Resorption: A Case Report. **EXCLUSIÓN: protocol.**
16.6. Zhang 2020 (BMC Oral Health.) Mandibular first premolar with five root canals: a case Report. **EXCLUSION: treatment.**
16.7. Lee 2020 (J Endod.) Combined Regenerative and Vital Pulp Therapies in an Immature Mandibular Molar: A Case Report. **DUPLICATED.**
16.8. Alqahtani 2020 (J Oral Implantol.) Implant Treatment for a Patient With Large Condensing Osteitis: Case Report. **EXCLUSION: treatment.**
16.9. Lui 2020 (J Endod.) An Immunofluorescence Study to Analyze Wound Healing Outcomes of Regenerative Endodontics in an Immature Premolar with Chronic Apical Abscess. **DUPLICATED.**
16.10. Nagaveni 2020 (Int J Clin Pediatr Dent.) A Comparative Evaluation of Revascularization Done in Traumatized Immature, Necrotic Anterior Teeth with and without Platelet-rich Fibrin: A Case Report. **DUPLICATED.**
16.11. Ramezani 2019 (Clin Case TER.) Revascularization and vital pulp therapy in immature molars with necrotic pulp and irreversible pulpitis: A case Report with two-year follow-up. **DUPLICATED.**
16.12. Ricucci 2020 (J Endod.) Histologic Response of Human Pulp and Periapical Tissues to Tricalcium Silicate-based Materials: A Series of Successfully Treated Cases. **EXCLUSION: treatment.**
16.13. de Albuquerque 2019 (J Endod.) Treatment of an Acute Apical Abscess in a Patient With Autoimmune Hepatitis Taking Alendronate: A Case Report. **EXCLUSION: treatment.**
16.14. Angerame 2020 (Oper Dent.) Multidisciplinary Management and Pulp Vitality Preservation of a Tooth With Extensive Iatrogenic Furcal Root Perforation and Biologic Width Violation. **EXCLUSION: treatment.**
16.15. Gaviño 2020 (Int Endod J.) Successful pulp revascularization of an autotransplantated mature premolar with fragile fracture apicoectomy and plasma rich in growth factors: a 3-year follow-up. **EXCLUSION: treatment.**
16.16. Mohan 2020 (Aust Endod J.) Successful management of a case of true radicular dens invaginatus using platelet-rich fibrin and guided tissue regeneration. **EXCLUSION: treatment.**
16.17. Arslan 2019 (J Endod.) Histologic Evaluation of Regenerated Tissues in the Pulp Spaces of Teeth with Mature Roots at the Time of the Regenerative Endodontic Procedures. **DUPLICATED.**
16.18. Chaniotis 2019 (J Endod.) Cervical Level Biological Repair of the Access Opening after Regenerative Endodontic Procedures: Three Cases with the Same Repair Pattern. **DUPLICATED.**
16.19. Arango-Gómez 2019 (Restor Dent Endod.) Pulp revascularization with and without platelet-rich plasma in two anterior teeth with horizontal radicular fractures: a case Report. **DUPLICATED.**
16.20. Arbel 2019 (Int Endod J.) Autotransplantation after primary bone Repair of a recipient site with a large periradicular lesion: a case Report. **EXCLUSION: treatment.**
16.21. Zhang 2019 (Hua Xi Kou Qiang Yi Xue Za Zhi.) [Endodontic-periodontal combined therapy for type III dens invaginatus in maxillary lateral incisor: a case Report]. **EXCLUSION: treatment.**
16.22. Alqedairi 2019 (World J Clin Cases.) Non-Invasive management of invasive cervical resorption associated with periodontal pocket: A case Report. **EXCLUSION: treatment.**
16.23. Nagaveni 2019 (Int J Clin Pediatr Dent.) Revascularization of a Nonvital, Immature Permanent Tooth Using Amniotic Membrane: A Novel Approach. **DUPLICATED.**
16.24. Sarmast 2019 (J Endod.) Nonsurgical Endodontic Treatment of Necrotic Teeth Resolved Apical Lesions on Adjacent Implants with Retrograde/Apical Peri-implantitis: A Case Series with 2-year Follow-up. **EXCLUSION: treatment.**
16.25. Sierakowski 2019 (J Hand Surg Eur Vol.) Reverse pedicled flap with use of the superficial palmar branch of the radial artery and venous supercharging for thumb pulp Repair. **EXCLUSION: treatment.**
16.26. Meza 2019 (J Endod.) Personalized Cell Therapy for Pulpitis Using Autologous Dental Pulp Stem Cells and Leukocyte Platelet-rich Fibrin: A Case Report. **DUPLICATED.**
16.27. AboulHosn 2019 (Case Rep Dent.) Decompression and Enucleation of a Mandibular Radicular Cyst, Followed by Bone Regeneration and Implant-Supported Dental Restoration. **EXCLUSION: treatment.**
16.28. John 2019 (Int J Clin Pediatr Dent.) Revascularization of an Immature Permanent Central Incisor with Complicated Crown Root Fracture: A Case Report. **EXCLUSIÓN: population.**
16.29. Ajram 2019 (Dent J (Basel)) Management of an Immature Necrotic Permanent Molar with Apical Periodontitis Treated by Regenerative Endodontic Protocol Using Calcium Hydroxide and MM-MTA: A Case Report with Two Years Follow Up. **DUPLICATED.**
16.30. Cheng 2019 (Ann Plast Surg.) Lateral Toe Pulp Flap Used in Reconstruction of Distal Dorsal Toe Defect: Case Report and Review of the Literature. **EXCLUSION: treatment.**
16.31. Austah 2018 (J Endod.) Comprehensive Characterization of 2 Immature Teeth Treated with Regenerative Endodontic Procedures. **DUPLICATED.**

16.32. Adhikari 2018 (J Conserv Dent.) Report of a case of platelet-rich fibrin-mediated revascularization of immature 12 with histopathological evaluation. **DUPLICATED.**
16.33. Kahler 2018 (J Endod.) Revascularization-associated Intracanal Calcification: A Case Report with an 8-year Review. **DUPLICATED.**
16.34. Aunmeungtong 2018 (Eur Endod J.) Endodontic Management of a Chronic Periapical Abscess in a Maxillary Central Incisor with an Immature Root Apex Using Platelet-Rich Fibrin: A Case Report. **DUPLICATED.**
16.35. Dhiman 2018 (Contemp Clin Dent.) Retrieval of Extruded Mineral Trioxide Aggregate Using a Novel Suction Device. **DUPLICATED.**
16.36. Rodrigues 2018 (J Clin Exp Dent.) Endodontic management of type II dens invaginatus with open apex and large periradicular lesion using the XP-endo Finisher: A case Report. **EXCLUSION: treatment.**
16.37. Hernández-Monjaraz 2018 (J Int Med Res.) Retrieval of a periodontally compromised tooth by allogeneic grafting of mesenchymal stem cells from dental pulp: A case Report. **DUPLICATED.**
16.38. Sockalingam 2018 (Case Rep Dent.) Maturogenesis of an Immature Dens Evaginatus Nonvital Premolar with an Apically Placed Bioceramic Material (EndoSequence Root Repair Material®): An Unexpected Finding. **DUPLICATED.**
16.39. Yang 2018 (Rev Assoc Med Bras) Repair of soft tissue defects of the fingers with medial plantar venous flap. **EXCLUSION: treatment.**
16.40. **Prasad 2018** (Contemp Clin Dent.) Comparison between the Outcomes of Two Platelet-Rich Concentrates on Apexogenesis in Young Permanent Incisors Requiring Endodontic Retreatment.
16.41. Bassetti 2018 (Swiss Dent J.) Regenerative endodontische Therapie nach Frontzahntrauma. Ein Fallbericht [Regenerative endodontics after front tooth trauma. A case Report]. **DUPLICATED.**
16.42. Natera 2018 (J Endod.) Regenerative Endodontic Treatment with Orthodontic Treatment in a Tooth with Dens Evaginatus: A Case Report with a 4-year Follow-up. **DUPLICATED.**
16.43. Calafat 2018 (Ann Chir Plast Esthet.) Partial medial second toe pulp free flap and dermal substitute with skin graft for salvage reconstruction of a complete skin envelope degloving of the small finger. **EXCLUSION: treatment.**
16.44. Lin 2018 (Aust Endod J.) Continued root maturation despite persistent apical periodontitis of immature permanent teeth after failed regenerative endodontic therapy. **DUPLICATED.**
16.45. Chaniotis 2018 (J Endod.) Orthodontic Movement after Regenerative Endodontic Procedure: Case Report and Long-term Observations. **DUPLICATED.**
16.46. Chong 2018 (J Plast Reconstr Aesthet Surg.) Refining the cross-finger flap: Considerations of flap insetting, aesthetics and donor site morbidity. **EXCLUSION: treatment.**
16.47. Karunakaran 2017 (J Pharm Bioallied Sci.) Successful Surgical Management of Palatogingival Groove Using Platelet-rich Fibrin and Guided Tissue Regeneration: A Novel Approach. **EXCLUSION: treatment.**
16.48. Timmerman 2018 (J Endod.) Bleaching of a Discolored Tooth with Retrieval of Remnants after Successful Regenerative Endodontics. **TRIPLICATED.**
16.49. Plascencia 2017 (Iran Endod J.) Non-Surgical Endodontic Management of Type II Dens Invaginatus with Closed and Open Apex. **TRIPLICATED.**
16.50. Soares 2017 (J Dent Child (Chic).) Management of a Permanent Maxillary Lateral Incisor with Vital Pulp and Necrotic Dens Invaginatus Type III. **EXCLUSION: treatment.**
16.51. Sarmast 2017 (J Endod) Classification and Clinical Management of Retrograde Peri-implantitis Associated with Apical Periodontitis: A Proposed Classification System and Case Report. **EXCLUSION: treatment.**
16.52. Tsukiboshi 2017 (J Endod.) Mandibular Premolars with Immature Roots and Apical Periodontitis Lesions Treated with Pulpotomy: Report of 3 Cases. **EXCLUSION: treatment.**
16.53. Mohamed 2017 (Open Access Maced J Med Sci.) The Effect of Three Different Biomaterials on Proliferation and Viability of Human Dental Pulp Stem Cells (In-vitro Study). **EXCLUSION: treatment.**
16.54. Fiore 2017 (Eur Endod J.) Dental Pulp Revascularization in a TERlanted Avulsed Immature Maxillary Permanent Central Incisor. **EXCLUSION: population.**
16.55. Chaniotis 2017 (J Endod.) Treatment Options for Failing Regenerative Endodontic Procedures: Report of 3 Cases. **CUADRIPLICATED.**
16.56. Mehrvarzfar 2017 (J Int Soc Prev Community Dent.) Modified Revascularization in Human Teeth Using an Intracanal Formation of Treated Dentin Matrix: A Report of Two Cases. **DUPLICATED.**
16.57. Gaviño 2017 (J Endod.) Use of Platelet-rich Plasma in Endodontic Procedures in Adults: Regeneration or Repair? A Report of 3 Cases with 5 Years of Follow-up **TRIPLICATED.**
16.58. Liao 2017 (J Endod.) Self-Repaired Process of a Traumatized Maxillary Central Incisor with Pulp Infarct after Horizontal Root Fracture Monitored by Laser Doppler Flowmetry Combined with Tissue Oxygen Monitor. **EXCLUSION: treatment.**

16.59. Peng 2017 (J Endod.) Histologic Findings of a Human Immature Revascularized/Regenerated Tooth with Symptomatic Irreversible Pulpitis. **EXCLUSION: population**.
16.60. Prasad 2017 (J Dent Res Dent Clin Dent Prospects.) Allogeneic stem cells derived from human exfoliated deciduous teeth (SHED) for the management of periapical lesions in permanent teeth: Two case Reports of a novel biologic alternative treatment. **DUPLICATED.**
16.61. Soni 2017 (J Clin Diagn Res.) Application of CAD-CAM for Fabrication of Metal-Free Band and Loop Space Maintainer. **EXCLUSION: treatment.**
16.62. Bakhtiar 2017 (J Endod.) Second-generation Platelet Concentrate (Platelet-rich Fibrin) as a Scaffold in Regenerative Endodontics: A Case Series. **TRIPLICATED.**
16.63. Dhaimy 2017 (Case Rep Dent.) Pulpo-Periodontal Regeneration: Management of Partial Failure Revascularization. **DUPLICATED.**
16.64. Carmen 2017 (Case Rep Dent.) Revascularization in Immature Permanent Teeth with Necrotic Pulp and Apical Pathology: Case Series. **EXCLUSIÓN: population.**
16.65. Dorielo 2017 (J Conserv Dent.) Root canal treatment of a fused mandibular incisor using cone-beam computed tomography as a diagnostic aid. **EXCLUSION: treatment.**
16.66. Schmoeckel 2017 (Quintessence Int.) Management of an immature, partially necrotic permanent molar by pulp revascularization: Two-year follow-up. **DUPLICATED.**
16.67. Kumar 2017 (J Clin Diagn Res.) Treatment of Periradicular Bone Defect by Periosteal Pedicle Graft as a Barrier Membrane and Demineralized Freeze-Dried Bone Allograft. **EXCLUSION: treatment.**
16.68. Jivoinovici 2017 (J Med Life.) Clinical radiological aspects of primary endodontic lesions with secondary periodontal involvement. **EXCLUSION: treatment.**
16.69. Kusgoz 2017 (J Pak Med Assoc.) Management of root resorption with mineral trioxide aggregate complicated by a luxation injury: Report of a case with six-year follow-up. **EXCLUSION: treatment.**
16.70. Cosme-Silva 2016 (Open Dent J.) Radicular Perforation Repair with Mineral Trioxide Aggregate: A Case Report with 10-Year Follow-up. **EXCLUSION: treatment.**
16.71. Cho 2017 (J Endod.) Collaborative Management of Combined Periodontal-endodontic Lesions with a Palatogingival Groove: A Case Series. **EXCLUSION: treatment.**
16.72. Chen 2016 (Ann Plast Surg.) Glabrous Flow-Through Flaps for Simultaneous Resurfacing, Revascularization, and Reinnervation of Digits. **DUPLICATED.**
16.73. Subash 2016 (J Clin Diagn Res.) Revitalization of an Immature Permanent Mandibular Molar with a Necrotic Pulp Using Platelet-Rich Fibrin: A Case Report. **TRIPLICATED.**
16.74. Al-Tammami 2017 (Restor Dent Endod.) Retreatment of failed regenerative endodontic of orthodontically treated immature permanent maxillary central incisor: a case Report. **TRIPLICATED.**
16.75. Marques 2016 (Eur Arch Paediatr Dent.) Immediate and mediate furcal perforation treatment in primary molars: 24-month follow-up. **EXCLUSION: treatment.**
16.76. Costa 2016 (World J Clin Cases.) Surgical treatment of cementoblastoma associated with apicoectomy and endodontic therapy: Case Report. **EXCLUSION: treatment.**
16.77. Pradeep 2016 (Niger J Clin Pract.) Platelet-rich fibrin combined with synthetic nanocrystalline hydroxy apatite granules in the management of radicular cyst. **EXCLUSION: treatment.**
16.78. Saoud 2016 (J Endod.) Regenerative Endodontic Procedures for Traumatized Teeth after Horizontal Root Fracture, Avulsion, and Perforating Root Resorption. **DUPLICATED.**
16.79. Soni 2016 (J Clin Diagn Res.) Biodentine Pulpotomy in Mature Permanent Molar: A Case Report. **EXCLUSION: treatment.**
16.80. Aldakak 2016 (Iran Endod J.) Single-Visit Pulp Revascularization of a Nonvital Immature Permanent Tooth Using Biodentine. **DUPLICATED.**
16.81. Dudeja 2016 (J Endod.) Management of a Previously Treated, Calcified, and Dilacerated Maxillary Lateral Incisor: A Combined Nonsurgical/Surgical Approach Assisted by Cone-beam Computed Tomography. **EXCLUSION: treatment.**
16.82. Kabakaş 2016 (Microsurgery.) Dorsal approach for vascular Repairs in distal finger TERlantations. **EXCLUSION: treatment.**
16.83. Sooratgar 2016 (Iran Endod J.) Management of an Endodontic-Periodontal Lesion in a Maxillary Lateral Incisor with Palatal Radicular Groove: A Case Report. **DUPLICATED.**
16.84. Žižka 2016 (J Endod.) Root Maturation in Teeth Treated by Unsuccessful Revitalization: 2 Case Reports. **DUPLICATED.**
16.85. Chaniotis 2016 (Int Endod J.) The use of a single-step regenerative approach for the treatment of a TERlanted mandibular central incisor with severe resorption. **EXCLUSION: population**.
16.86. Mavridou 2016 (Int Endod J.) A novel multimodular methodology to investigate external cervical tooth resorption. **EXCLUSION: treatment.**

17. SEVENTEENTH SEARCH - CASE REPORTS: (tissue engineering) AND (endodontics) - 9 results- PUBMED
    17.1. Cordero 2020 (J Endod.) Allogeneic Cellular Therapy in a Mature Tooth with Apical Periodontitis and Accidental Root Perforation: A Case Report. **DUPLICATED.**
    17.2. Quenot 2020 (J Stomatol Oral Maxillofac Surg.) Gingival Mucosa-Associated Lymphoid Tissue (MALT) lymphoma developed around a mandibular extraosseous dental root canal overfilling: A case Report. **EXCLUSION: treatment.**
    17.3. Chen 2020 (Aust Endod J.) Multiple idiopathic cervical root resorption involving all permanent teeth. **EXCLUSION: treatment.**
    17.4. Lui 2020 (J Endod.) An Immunofluorescence Study to Analyze Wound Healing Outcomes of Regenerative Endodontics in an Immature Premolar with Chronic Apical Abscess. **TRIPLICATED.**
    17.5. Meza 2019 (J Endod.) Personalized Cell Therapy for Pulpitis Using Autologous Dental Pulp Stem Cells and Leukocyte Platelet-rich Fibrin: A Case Report. **TRIPLICATED.**
    17.6. Austah 2018 (J Endod.) Comprehensive Characterization of 2 Immature Teeth Treated with Regenerative Endodontic Procedures. **TRIPLICATED.**
    17.7. Tzanetakis 2018 (J Endod.) Management of Intruded Immature Maxillary Central Incisor with Pulp Necrosis and Severe External Resorption by Regenerative Approach. **DUPLICATED.**
    17.8. Dhaimy 2017 (Case Rep Dent.) Pulpo-Periodontal Regeneration: Management of Partial Failure Revascularization. **TRIPLICATED.**
    17.9. Li 2017 (Beijing Da Xue Xue Bao Yi Xue Ban) [Combination of periodontal, orthodontic and endodontic therapy in upper anterior teeth with hopeless prognosis and long-time follow-up: a case Report]. **EXCLUSION: language (Chinese).**

18. EIGHTEENTH SEARCH - CASE REPORTS: (stem cells OR scaffolds OR growth factor) AND (pulp) AND (tooth) - 23 results - PUBMED
    18.1. Cordero 2020 (J Endod.) Allogeneic Cellular Therapy in a Mature Tooth with Apical Periodontitis and Accidental Root Perforation: A Case Report. **TRIPLICATED.**
    18.2. Nagaveni 2020 (Int J Clin Pediatr Dent.) A Comparative Evaluation of Revascularization Done in Traumatized Immature, Necrotic Anterior Teeth with and without Platelet-rich Fibrin: A Case Report. **TRIPLICATED.**
    18.3. Kandemir 2020 (J Clin Pediatr Dent.) Regenerative Endodontic Therapy with Platelet Rich Fibrin: Case Series **DUPLICATED.**
    18.4. Gaviño 2020 (Int Endod J.) Successful pulp revascularization of an autotransplantated mature premolar with fragile fracture **DUPLICATED.**
    18.5. Ghana 2019 (J Dent (Shiraz)) Towards a New Era in the Management of Large Periapical Lesion in Permanent Tooth Using Stemcells: A 2-Year Clinical Application Report. **EXCLUSION: treatment.**
    18.6. Meschi 2019 (J Endod.) Regenerative Endodontic Procedures Posttrauma: Immunohistologic Analysis of a Retrospective Series of Failed Cases. **DUPLICATED.**
    18.7. Nagaveni 2019 (Int J Clin Pediatr Dent.) Revascularization of a Nonvital, Immature Permanent Tooth Using Amniotic Membrane: A Novel Approach. **TRIPLICATED.**
    18.8. Meza 2019 (J Endod.) Personalized Cell Therapy for Pulpitis Using Autologous Dental Pulp Stem Cells and Leukocyte Platelet-rich Fibrin: A Case Report. **CUADRIPLICATED.**
    18.9. Austah 2018 (J Endod.) Comprehensive Characterization of 2 Immature Teeth Treated with Regenerative Endodontic Procedures. **CUADRIPLICATED.**
    18.10. Adhikari 2018 (J Conserv Dent.) Report of a case of platelet-rich fibrin-mediated revascularization of immature 12 with histopathological evaluation. **TRIPLICATED.**
    18.11. Hernández-Monjaraz 2018 (J Int Med Res.) Retrieval of a periodontally compromised tooth by allogeneic grafting of mesenchymal stem cells from dental pulp: A case Report. **DUPLICATED.**
    18.12. Hirofuji 2018 (Biochem Biophys Res Commun.) Mitochondrial dysfunction in dopaminergic neurons differentiated from exfoliated deciduous tooth-derived pulp stem cells of a child with Rett syndrome. **EXCLUSION: treatment.**
    18.13. Porntaveetus 2018 (Oral Dis.) Dental properties, ultrastructure, and pulp cells associated with a novel DSPP mutation. **EXCLUSION: treatment.**
    18.14. Kantaputra 2017 (Eur J Med Genet.) Al-Awadi-Raas-Rothschild syndrome with dental anomalies and a novel WNT7A mutation. **EXCLUSION: treatment.**
    18.15. Mohamed 2017 (Open Access Maced J Med Sci.) The Effect of Three Different Biomaterials on Proliferation and Viability of Human Dental Pulp Stem Cells (In-vitro Study). **DUPLICATED.**
    18.16. Gaviño 2017 (J Endod.) Use of Platelet-rich Plasma in Endodontic Procedures in Adults: Regeneration or Repair? A Report of 3 Cases with 5 Years of Follow-up **CUADRIPLICATED.**

18.17. Prasad 2017 (J Dent Res Dent Clin Dent Prospects.) Allogeneic stem cells derived from human exfoliated deciduous teeth (SHED) for the management of periapical lesions in permanent teeth: Two case Reports of a novel biologic alternative treatment. **TRIPLICATED.**

18.18. Bakhtiar 2017 (J Endod.) Second-generation Platelet Concentrate (Platelet-rich Fibrin) as a Scaffold in Regenerative Endodontics: A Case Series. **CUADRIPLICATED.**

18.19. Carmen 2017 (Case Rep Dent.) Revascularization in Immature Permanent Teeth with Necrotic Pulp and Apical Pathology: Case Series. **DUPLICATED.**

18.20. Kim 2016 (Pediatr Dent.) Complication After Extraction of Natal Teeth with Continued Growth of a Dental Papilla. **EXCLUSION: treatment.**

18.21. Subash 2016 (J Clin Diagn Res.) Revitalization of an Immature Permanent Mandibular Molar with a Necrotic Pulp Using Platelet-Rich Fibrin: A Case Report. **CUADRIPLICATED.**

18.22. Topçuoğlu 2016 (J Endod.) Regenerative Endodontic Therapy in a Single Visit Using Platelet-rich Plasma and Biodentine in Necrotic and Asymptomatic Immature Molar Teeth: A Report of 3 Cases. **DUPLICATED.**

18.23. Dudeja 2016 (J Endod.) Management of a Previously Treated, Calcified, and Dilacerated Maxillary Lateral Incisor: A Combined Nonsurgical/Surgical Approach Assisted by Cone-beam Computed Tomography. **DUPLICATED.**

Filters applied to search case reports in Pubmed: Case Report, 5 years, full text. Last search for case reports performed in Pubmed: 08/04/2021.

Search strategy in Cochrane

1. FIRST SEARCH -TRIALS: ((regenerative) AND (endodontic)) AND (treatment OR therapy OR procedures OR technique) – 39 results - COCHRANE.

1.1. CT.gov: 18 records.

1.2. ICTRP: 5 records.

1.3. Embase: 9.

1.3.1. Ali 2021 (Clin Oral Investig.). Effectiveness of the static-guided endodontic technique for accessing the root canal through MTA and its effect on fracture strength. **DUPLICATED.**

1.3.2. El-Kateb 2020 (J Endod.) Quantitative Assessment of Intracanal Regenerated Tissues after Regenerative Endodontic Procedures in Mature Teeth Using Magnetic Resonance Imaging: A Randomized Controlled Clinical Trial. **SIX-FOLD.**

1.3.3. ElSheshtawy 2020 (Int Endod J.) The effect of platelet-rich plasma as a scaffold in regeneration/ revitalization endodontics of immature permanent teeth assessed using 2-dimensional radiographs and cone beam computed tomography: a randomized controlled trial **SEVEN-FOLD.**

1.3.4. Brizuela 2020 (J Dent Res.). Cell-Based Regenerative Endodontics for Treatment of Periapical Lesions: A Randomized, Controlled Phase I/II Clinical Trial. **SEVEN-FOLD.**

1.3.5. de-Figueiredo 2020 (PLoS One) Apical periodontitis healing and postoperative pain following endodontic treatment with a reciprocating single-file, single-cone approach: A randomized controlled pragmatic clinical trial. **TRIPLICATED.**

1.3.6. Ulusoy 2019 (J Endod.) Evaluation of Blood Clot, Platelet-rich Plasma, Platelet-rich Fibrin, and Platelet Pellet as Scaffolds in Regenerative Endodontic Treatment: A Prospective Randomized Trial. **TRIPLICATED.**

1.3.7. Mohamed 2020 (Saudi Dent J.) Comparative evaluation of Platelet Rich Plasma (PRP) versus Platelet Rich Fibrin (PRF) scaffolds in regenerative endodontic treatment of immature necrotic permanent maxillary central incisors: A double blinded randomized controlled trial. **EXCLUSION: population.**

1.3.8. Shivashankar 2017 (Journal of clinical and diagnostic research) Comparison of the effect of PRP, PRF and induced bleeding in the revascularization of teeth with necrotic pulp and open apex: a triple blind randomized clinical trial. **EXCLUSION: population.**

1.3.9. Botero 2017 (J Endod.) Clinical Evidence for Regenerative Endodontic Procedures: Immediate versus Delayed Induction? **QUINTUPLICATED.**

2. SECOND SEARCH -TRIALS: (pulp) AND (revascularization OR revitalization OR regeneration) – 58 results - COCHRANE.

2.1. CT.gov: 23 records.

2.2. ICTRP: 6 records.

2.3. Embase: 15 records.

2.3.1. Hernández-Monjaraz 2020 (Stem Cells Int.) Dental Pulp Mesenchymal Stem Cells as a Treatment for Periodontal Disease in Older Adults. **EXCLUSION: treatment.**

2.3.2. Machado 2020 (Trials). Pulp Repair response after the use of a dentin-pulp biostimulation membrane (BBio) in primary teeth: study protocol for a randomized clinical trial. **EXCLUSION: treatment.**

2.3.3. El-Kateb 2020 (J Endod.) Quantitative Assessment of Intracanal Regenerated Tissues after Regenerative Endodontic Procedures in Mature Teeth Using Magnetic Resonance Imaging: A Randomized Controlled Clinical Trial. **SEVEN-FOLD.**

2.3.4. Attia 2020 (J Clin Med) Long-term influence of platelet-rich plasma (Prp) on dental implants after maxillary augmentation: retrospective clinical and radiological outcomes of a randomized controlled clinical trial. **EXCLUSION: treatment.**

2.3.5. Brizuela 2020 (J Dent Res.). Cell-Based Regenerative Endodontics for Treatment of Periapical Lesions: A Randomized, Controlled Phase I/II Clinical Trial. **EIGHT-FOLD.**

2.3.6. Madani 2020 (Den Res J) Evaluation of tooth discoloration after treatment with mineral trioxide aggregate, calcium-enriched mixture, and BiodentineÂ® in the presence and absence of blood. **EXCLUSION: treatment.**

2.3.7. Zacharczuk 2019 (Acta Odontol Latinoam.) Evaluation of 3Mix-MP and pulpectomies in non-vital primary molars. **TRIPLICATED.**

2.3.8. Mohamed 2020 (Saudi Dent J.) Comparative evaluation of Platelet Rich Plasma (PRP) versus Platelet Rich Fibrin (PRF) scaffolds in regenerative endodontic treatment of immature necrotic permanent maxillary central incisors: A double blinded randomized controlled trial. **DUPLICATED.**

2.3.9. Rodrigues 2019 (Annals of Medicine)) Condensing osteitis in the diagnosis consultation at Egas Moniz University Clinic. **EXCLUSION: treatment.**

2.3.10. Ferrarotti 2018 (J Clin Periodontol.) Human intrabony defect regeneration with micrografts containing dental pulp stem cells: A randomized controlled clinical trial. **QUINTUPLICATED.**

2.3.11. Xuan 2018 (Sci Transl Med.) Deciduous autologous tooth stem cells regenerate dental pulp after implantation into injured teeth. **QUINTUPLICATED.**

2.3.12. Li 2018 (Chinese J. Tissue Eng. Res.). Effectiveness and safety of pulp regeneration and revascularization therapy for pulpal necrosis of the immature permanent tooth: study protocol for a single-center, randomized, controlled, clinical trial. **EXCLUSION: language.**

2.3.13. Botero 2017 (J Endod.) Clinical Evidence for Regenerative Endodontic Procedures: Immediate versus Delayed Induction? **SIX-FOLD.**

2.3.14. Moradi 2016 (Cell J). Immunohistological evaluation of revascularized immature permanent necrotic teeth treated by platelet-rich plasma: an animal investigation **EXCLUSION: treatment.**

2.3.15. Cuadros-Fernández 2016 (Clin Oral Investig.) Short-term treatment outcome of pulpotomies in primary molars using mineral trioxide aggregate and Biodentine: a randomized clinical trial. **TRIPLICATED.**

2.4. CINAHL: 1 records.

2.4.1. Al-Hezaimi 2020 (Int J Periodontics Restorative Dent) Regeneration of Secondary Dentin Using Recombinant Human Platelet-Derived Growth Factor and MTA for Pulp Capping: A Randomized Controlled Human Clinical Trial. **EXCLUSION: treatment.**

3. THIRD SEARCH -TRIALS: (stem cells) AND (pulp) AND (tooth) – 30 results - COCHRANE.

3.1. CT.gov: 12 records.

3.2. ICTRP: 7 records.

3.3. Embase: 10 records.

3.3.1. Hernández-Monjaraz 2020 (Stem Cells Int.) Dental Pulp Mesenchymal Stem Cells as a Treatment for Periodontal Disease in Older Adults. **DUPLICATED.**

3.3.2. Yan 2020 (In Vivo.). Expansion of Human Dental Pulp Cells *In Vitro* Under Different Cryopreservation Conditions. **EXCLUSION: treatment.**

3.3.3. Ye 2020 (Trials) Safety and efficacy assessment of allogeneic human dental pulp stem cells to treat patients with severe COVID-19: structured summary of a study protocol for a randomized controlled trial (Phase I / II). **EXCLUSION: treatment.**

3.3.4. Attia 2020 (J Clin Med) Long-term influence of platelet-rich plasma (Prp) on dental implants after maxillary augmentation: retrospective clinical and radiological outcomes of a randomized controlled clinical trial. **DUPLICATED.**

3.3.5. Brizuela 2020 (J Dent Res.). Cell-Based Regenerative Endodontics for Treatment of Periapical Lesions: A Randomized, Controlled Phase I/II Clinical Trial. **EIGHT-FOLD.**

3.3.6. Daniela 2020)Stem Cells Int.) Deciduous Dental Pulp Stem Cells for Maxillary Alveolar Reconstruction in Cleft Lip and Palate Patients

3.3.7. Ferrarotti 2018 (J Clin Periodontol.) Human intrabony defect regeneration with micrografts containing dental pulp stem cells: A randomized controlled clinical trial. **SEVEN-FOLD.**

3.3.8. Xuan 2018 (Sci Transl Med.) Deciduous autologous tooth stem cells regenerate dental pulp after implantation into injured teeth. **SIX-FOLD.**

3.3.9. Rabello 2017 (Photodiagnosis Photodyn Ther).Does supplemental photodynamic therapy optimize the disinfection of bacteria and endotoxins in one-visit and two-visit root canal therapy? A randomized clinical trial. **EXCLUSION: treatment.**

3.3.10.Nagpal 2016 (Int J Stroke.) TOOTH (The Open study Of dental pulp stem cell Therapy in Humans): Study protocol for evaluating safety and feasibility of autologous human adult dental pulp stem cell therapy in patients with chronic disability after stroke. **TRIPLICATED.**

Filters applied to search Pubmed: Title, abstract, keyword. First published between 2016 and 2021. Sources: Embase and CINAHL. ICRTP and CT.gov excluded because of being register sources in press or not published, as well as PUMBED, because the search there was already done. Case Report, 5 years, full text. Last search performed in Cochrane: 04/04/2021.

Supplementary File 2. Key characteristics and population, protocol and outcome details of the studies included in the review.

Supplemental Table 1. Presentation of the Randomized Controlled Trials included in the Review (mature teeth).

First author and Year	Journal	Study	Study design	Objective	Outcomes	Conclusion
1. BRIZUELA 2020 [32]	Dent Res J.	Cell-Based Regenerative Endodontics for Treatment of Periapical Lesions: A	Randomized, Controlled Phase I/II Clinical Trial.	Evaluate safety and efficacy of encapsulated UC-MSCs in a plasma-derived biomaterial for REPs in mature permanent	No adverse events were reported. Patients showed 100% clinical efficacy in both groups.	We present the first clinical safety and efficacy evidence of the endodontic use of allogenic encapsulated UC-MCS in a plasma-derived biomaterial.
2. EL-KATEB 2020 [33]	J Endod	Quantitative Assessment of Intracanal Regenerated Tissues after Regenerative Endodontic Procedur	A Randomized Controlled Clinical Trial.	Assess tissue regeneration after REPs with 2 different apical preparation sizes in mature teeth using magnetic resonance imaging.	All 18 teeth were symptom free with healing of the periapical lesions. No statistically significant difference between the signal intensity of the normal contralateral teeth and that of the regenerated tissues in the	Vital pulplike tissue could be successfully regenerated in mature teeth using REPs, which was not significantly affected by the size of the apical diameter. MRI could successfully assess this tissue in a quantitative, noninvasive manner.
3. ARSLAN 2019 [34]	J Endod	Regenerative Endodontic Procedures in Necrotic Mature Teeth with Periapical	Preliminary Randomized Clinical Study	This preliminary study compared clinical and radiographic outcomes of REPs with that of CRCT in necrotic	Favorable clinical and radiographic outcomes in 92.3% and 80% in REPs and CRCT groups, respectively. The difference was not statistically significant. Half of the teeth	REPs have the potential to be used as a treatment option for mature teeth with large periapical radiolucencies.

REPs: regenerative endodontic procedures; UC-MSCs: human umbilical cord mesenchymal stem cells; MRI: magnetic resonance imaging; CRCT: conventional root canal treatment.

Supplemental Table 2. Presentation of the Case Reports included in the Review (mature teeth).

First author	Journal	Study	Study design	Objective	Outcomes	Conclusion
1. CORDERO 2020 [35]	J Endod.	Allogeneic Cellular Therapy in a Mature Tooth with Apical Periodontitis and Accidental	Case report.	Describe cell-based therapy using allogeneic UC-MSCs encapsulated in a bioscaffold for a complex case of a mature permanent tooth with apical periodontitis and	Normal responses to percussion and palpation tests; the tooth was responsive to the electric pulp test, and the vitality test indicated low blood perfusion units after 1 year.	This case report reveals the potential use of allogeneic cellular therapy using encapsulated UC-MSCS in a platelet-poor plasma scaffold
2. ARSLAN 2019 [36]	J Endod	Histologic Evaluation of Regenerated Tissues in the Pulp Spaces of Teeth with Mature Roots	Case report.	To present histologic findings with regard to regenerative tissues in the pulp spaces exposed after dental trauma in human mature maxillary	The vital tissue formed in the canal space was fibrous connective tissue that contains bonelike tissue, vascular structures, and inflammation.	These histologic findings with regard to mature teeth were similar to the findings of previous reports relating to immature teeth.
3. NAGAS 2018 [37]	Restor Dent Endod.	Revitalization of necrotic mature permanent incisors with apical periodontitis: a case reports.	Case report.	To describe the procedures and outcome of REPs in 2 previously-traumatized incisors with closed apex with apical	No symptoms, complete resolution of apical radiolucency and reestablishment of periradicular tissues. The dimensions of root space remained	The revitalization protocol utilizing root canal disinfection and induced apical bleeding in necrotic, closed-
4. SAOUD 2016 [38]	J. Endod.	Regenerative Endodontic Procedures for Traumatized Teeth after Horizontal Root	Case series	Perform REPs in traumatized teeth with horizontal root fractures resulting in pulp necrosis and inflammatory root	Clinical signs/ symptoms subsided, and inflammatory osteolytic lesions resolved in all traumatized teeth.	Based on these case reports, REPs have the potential to be used to treat traumatized teeth with horizontal
5. PRASAD 2017 [39]	J Dent Res Dent Clin Dent Prospects.	Allogeneic stem cells derived from human exfoliated deciduous teeth (SHED) for the management of periapical lesions in	Case report.	Report two cases treated utilizing SHED in the management of periapical lesions in permanent teeth.	No symptoms, closure of open apex and periapical tissue healing, positive response to electric pulp testing. Complete resolution of periapical radiolucency in a span of 30 days.	SHED could be considered effective in treating the periapical lesions and open apex in permanent teeth.

UC-MSCs: human umbilical cord mesenchymal stem cells; REPs: regenerative endodontic procedures; CRCT: conventional root canal treatment; SHED: stem cells derived from human exfoliated deciduous teeth.

Supplemental Table 3. Presentation of the Case Reports included in the Review (immature teeth).

First author and Y...	Jou rnal	Study	Stu dy desi...	Objective	Outcomes	Conclusion
1. ARORA 2020 [40]	J Conserv Dent.	A 5 years' follow-up of root anatomy-based maturogenesis achieved in infected immature molars using regenerative t... A...	Case series.	To describe a feasible technique for attempting maturogenesis based on molar tooth anatom.	Outcome was evaluated clinically and radiographically at the periods of 3, 6, 12, 24, 36, and 60 months. All the teeth showed continued root development and maintained f...	Anatomical aspects of individual roots within a tooth can be utilized as a guide to decide the appropriate approach for attempting t...
2. NIVETHITHA 2020 [41]	Case Rep Dent.	Concentrated Growth Factor: A Novel Platelet Concentrate for Revascularization of Immature Permanent Teeth-A... of T...	Case report.	To elucidate the utilization of a novel platelet concentrate-CGF for rapid and successful healing outcome ... PRF	At 1-year follow-up, apical closure with increased root dentin thickness and reduced periapical radiolucency was evident.	CGF holds substantial promise for use in revascularization techniques in immature permanent tooth.
3. KANDEMIR 2020 [42]	J Clin Pediatr Dent.	Regenerative Endodontic Therapy with Platelet Rich Fibrin: Case Series.	Case series.	Evaluate REPs of immature permanent teeth using PRF at 36-month follow-up periods.	At the end of the 36-month follow-up periods, there was no response to pulp sensibility tests with cold and electric pulp tester, but all teeth ...	More prospective randomized clinical trials and histological studies are necessary to determine the b... of PRF i...
4. NAGAVENI 2020 [43]	Int J Clin Pediatr Dent.	A Comparative Evaluation of Revascularization Done in Traumatized Immature, Necrotic Anterior Teeth with and without Platelet-rich	Case report.	To present two methods of revascularization done in traumatized immature, nonvital anterior teeth using PRF and natural blood clot as a scaffold material.	After 12 months both teeth showed negative response to percussion and palpation tests but positive response to cold and electric pulp tests. On radiographic examination, it exhibited comparatively faster root lengthening and th...	PRF may be a boon to REPs. Long-term prospective trials are absolutely essential for comparing conventional blood-induced REPs with PRF-assisted REPs outcomes in cases o...
5. BROGNI 2020 [44]	Aust Endod J.	A second attempt at pulp revascularisation on an immature traumatised anterior tooth: a case report with two-year follow-up.	Case report.	To describe the second attempt at REPs, using an association between 2% CHX and CH as intracanal dressing, in an immature traumatised anterior tooth with pulp ...	Observations showed evidence of root development, dentinal wall thickening and periapical healing after 24 months. In this case, the association between CHX and CH showed favourable results as an intracanal medication.	The association between 2% CHX and CH as an intracanal dressing showed more favourable results than TAP. The failure of a first attempt at revascularisation does not prevent a second attempt. F...
6. ANTOV 2019 [45]	Int Endod J.	Management of discolouration following revitalization endodontic procedures: A case series.	Case series.	To discuss the management of three cases of discolouration following RET, highlighting limitations and providing advice for improving the aesthetic ...	The first two cases highlight successful management of post-RET discolouration through the use of internal–external bleaching. The use of internal bleaching in the third case was not recommended; ...	Discolouration can be a common side effect of REPs. Clinicians should be aware of the procedural aspects that can reduce its occurrence, as well as the ... available

7. ADHIKARI 2018 [46]	J Conserv Dent.	Report of a case of platelet-rich fibrin-mediated revascularization of immature 12 with histopathological evaluation.	Case report.	To describe REPs in an immature nonvital 1.2 with apical pathology.	On follow-up at 6 and 12 months, healing of periapical lesion, dentinal thickening, and apical closure with a canal exit forming distally were evident. The tooth got	PRF may yield favorable outcomes in regenerative endodontic procedures.
8. SURESH 2018 [47]	Dent J (Basel).	Successful Regenerative Endodontic Procedure of a Nonvital Immature	Case report.	To perform REPs in a nonvital immature permanent central incisor	The resolution of disease process and increase in canal width, as well as positive response to pulp sensitivity tests,	This case report confirms that HAM can be used as a scaffold material for successful REPs.
9. AUNMENTONG 2018 [48]	Eur Endod J.	Endodontic Management of a Chronic Periapical Abscess in a Maxillary Central Incisor with an	Case report.	To report REPs clinical and radiographic outcomes of a necrotic immature maxillary central	One year later, the patient remained asymptomatic. Radiological examination using CBCT showed that t buccal alveolar bone	REPs using PRF may provide favourable treatment outcomes for necrotic immature teeth with
10. PLASCENCIA 2017 [49]	Iran Endod J.	Non-Surgical Endodontic Management of Type II Dens Invaginatus with Closed and Open Apex.	Case report.	To present two cases of type II DI in the maxillary lateral incisors, treated by CRCT and REPs.	Complete resolution of the pre-existing apical radiolucency, apical closure, thickening of the root canal walls, and increase in root length, after 32 months was observed.	CRCT should be the first line of treatment for these cases. REPs in teeth that develop pulp necrosis and exhibit early stage of root
11. PRASAD 2018 [50]	Contemp Clin Dent.	Comparison between the Outcomes of Two Platelet-Rich Concentrates on Apexogenesis in Young Permanent	Case report.	To highlight the difference between the outcomes of using PRF and PRP for REPs in a 13-year-old	After 2 years, all the upper maxillary incisors revealed dentinal wall thickening, root lengthening, and apical closure.	PRF and PRP are efficient in inducing pulp regeneration and apexogenesis in teeth that have undergone
12. PINTO 2017 [51]	J Endod.	An Innovative Regenerative Endodontic Procedure Using Leukocyte and Platelet-rich Fibrin Associated with Apical Surgery: A Case	Case report.	To describe innovative REPs using L-PRF in the root canal and an extensive apical lesion in an immature tooth with dens invaginatus and	The clinical evaluations performed at 6 months and 1 year revealed an absence of symptoms, the apical lesion was resolved, root length increased and the walls had thickened.	L-PRF can be used as a complement in apical surgery and REPs and could provide an innovative alternative treatment strategy
13. PRASAD 2017 [50]	J Dent Res Dent Clin Dent Prospects.	Allogeneic stem cells derived from human exfoliated deciduous teeth (SHED) for the management of periapical lesions in permanent	Case report.	To report two cases treated utilizing SHED in the management of periapical lesions in permanent teeth.	Clinical examination revealed no symptoms, closure of open apex and periapical tissue healing, positive response to electric pulp testing and complete resolution	SHED could be considered effective in treating the periapical lesions and open apex in permanent teeth.

14. BAKHTIAR 2017 [52]	J Endod.	Second-generation Platelet Concentrate (Platelet-rich Fibrin) as a	Case series.	To report the clinical and radiographic results of a REP using PRF in immature teeth	All cases were asymptomatic. Radiographs revealed resolution of the periapical lesions, further root	On the basis of the short-term results up to 12 months, PRF clots acted as successful
15. AL-TAMMAMI 2017 [53]	Restor Dent Endod.	Retreatment of failed regenerative endodontic of orthodontically treated immature permanent maxillary central incisor: a case	Case report.	To present a case of retreatment of failed revascularization of an orthodontically treated immature traumatized permanent	Follow-up examination revealed an asymptomatic tooth, with evidence of periapical healing and root maturation.	Retreatment of failed REPs performed on an orthodontically active patient achieved healing of the periapical radiolucency and continuation of
16. GAVIÑO 2017 [54]	J Endod.	Use of Platelet-rich Plasma in Endodontic Procedures in Adults: Regeneration or Repair? A Report of 3 Cases with 5 Years of Follow-up	Case report.	To report the outcomes of the adjuvant use of autologous PRP in REPs in adults.	At controls, complete disappearance of the radiolucent lesions and the presence of calcified structures forming bridges occupying the pulp lumen were observed but not an ostensible thickening of root walls with a regeneration of pulp-	The repair of periapical tissues with REPs of open apex teeth with apical periodontitis and in nonsurgical endodontic retreatment appears to be feasible in adults, but no
REPs: regenerative endodontic procedures; CGF: concentrated growth factor; PRF: platelet-rich fibrin; CHX: chlorhexidine; CH: calcium hydroxide; TAP: triple antibiotic paste; HAM: human amniotic membrane; CBCT: cone beam computed tomography; CRCT: conventional root canal treatment; PRP: platelet-rich plasma; L-PRF: leukocyte						

Supplemental Table 4. Population, Treatment and Comparison of the Randomized Clinical Trials included in the Review (mature teeth).

First author and	Population	Treatment	Comparison
1. BRIZUELA 2020 [32]	36 incisors, canines or premolars (mature, necrotic with periapical lesion) from 36 patients (aged 16-58 years).	18 REPs.	18 CRCT.
2. EL-KATEB 2020 [33]	18 anterior teeth (mature, necrotic with periapical lesion) from 18 patients (aged 20-40 years).	9 REPs (instrumented until X3).	9 REPs (instrumented until X5).
3. ARSLAN 2019 [34]	56 incisors, canines and premolars (mature, necrotic with periapical lesion) from 46 patients (REPs aged 20.58± 2.53 years, CRCT	26 REPs.	20 CRCT.
REPs: regenerative endodontic procedures; CRCT: conventional root canal treatment.			

Supplemental Table 5. Clinical Protocol of the Randomized Clinical Trials included in the Review (mature teeth).

First author and Year	1st session				2nd session				2/3rd session	Number of sessions and
	Anesthesia	Instrumentation	Irrigant	Intracanal dressin	Anesthesia	Irrigant	Tissue engineering	Coronal barrier	Final restoration	
1. BRIZUELA 2020 [32]	Lidocaine 2% with vc.	Reciprocating system.	20 mL 2.5% NaOCl. Sonic activation	CH.	?	20 mL 17% EDTA. Witho	Scaffol: BC. Stem cells: PPP UC-MSC	Hemostatic sponge + Biodentine.	2nd session: compo.	2 sessions (3 w.).
2. EL-KATEB 2020 [33]	2% lidocaine with vc.	Reciprocating system.	20 mL 1.5% NaOCl.	CH.	3% mepivacaine without vc.	20 mL 1.5% NaOCl + 20 mL 17% EDTA 1 min.	Scaffold: BC.	Biodentine.	2nd session: GIC + compo.	2 sessions (interval?).
3. ARSLAN 2019 [34]	Articaine with vc.	Reciprocating system and manual instrumentation.	5 mL 1% NaOCl 1 min. + 5 mL 17% EDTA 1 min.	TAP (doxi, metro, cipro).	Mepivacaína 3% without vc.	5 mL 1% NaOCl 1 min. + 2 mL 5% EDTA 1 min. + 5 mL distille	Scaffold: BC.	MTA.	3rd session: compo.	3 sessions (3 w.; 1 d.).

vc: Vasoconstrictor; NaOCl: Sodium Hypochlorite; CH: Calcium Hydroxide; EDTA: Ethylenediamine Tetraacetic Acid; BC: Blood Clot; PPP: Platelet-Poor Plasma; UC-MSCs: Umbilical Cord Mesenchymal Stem Cells; GIC: Glass-Ionomer Cement; compo: Composite; MTA: Mineral Trioxide Aggregate; TAP: Triple Antibiotic Paste; w: Week.; d: Day; min: Minute.

Supplemental Table 6. Outcomes obtained through the Randomized Clinical Trials included in the Review (mature teeth).

First author and Year	Clinical and Radiographic exams	Primary Outcome		Secondary Outcome		Adverse effects	Follow-up
		Evidence of bony	Absence of symptoms	Positive response to sensitivity testing ou signs	Outcomes at months 12		
				Preoperatory values			
1. BRIZUELA 2020 [32]	− CBCT. − Rx. − Sensitivity test (cold, hot and electric). LDF	100%.	100%.	LDF: 60.6%. Cold: 6%. Electric: 17%. Hot: 0%.	LDF: 78.1%. Cold: 56%. Electric: 50%. Hot: 28%.	No.	6, 12 m.

2. EL-KATEB 2020 [33]	− Rx. − MR. − Sensitivity test (cold and electric).	100% ambos grupos.	100% ambos grupos.	X3 Cold: 0%. Electric: 0%. MR IS: 380.57 ± 280.50 medium third; 275.38 ± [illegible]	X3 Cold: 77.8%. Electric: 66.7%. MR SI: 577.9 ±71.1 [illegible]	No.	Rx and clinical exam: 1, 3, 6, 9, 12 m. MR: 3,6, 12 m.
				X5 Cold: 0% Electric: 0% RM SI: 327.95 ± 255.0 medium third; 289.59 ± 200.21 apical [illegible]	X5 Frío: 88.9% Eléctrico: 88.9% MRI SI: 506.9 ± 103.5 medium [illegible]		
3. ARSLAN 2019 [34]	− Rx. − Sensitivity test [illegible]	92.3%.	100%.	?	Electric: 50%	Discoloration: 38.5% (10 teeth).	12 m.

LDF: Laser Doppler Flowmetry; m: month. MR: magnetic resonance imaging. SI: signal intensity; Rx: periapical radiography; CBCT: cone beam computed tomography; m: month.

Supplemental Table 7. Clinical Protocol in the Case Reports included in the Review (mature teeth).

First author, Year, Population	1st session				2nd session				2/3th [illegible]	Number of sessions [illegible]
	Anesthesia	Instrumentation	Irrigant	Intracanal dressing	Anesthesia	Irrigant	Tissue engineering	Coronal barrier	Final restoration	
1. CORDERO 2020 [35]	*Supplemental Table 8.*									
2. ARSLAN 2019 [36] 20 years, teeth 1.1 and 1.2	1.8 mL articaine with vc.	Reciprocating system and manual instrumentation..	5 mL 1% NaOCl 1 min. + 4 mL 5% EDTA 1 min.	TAP (metro., cipro., doxy.) 1:1:1)	3% mepivacaine without vc.	5 mL 1% NaOCl 1 min + 2 mL 5% EDTA 1 min. + 5 mL distilled [illegible]	Scaffold: BC.	MTA	Compo.	3 sessions (3 w.; 1 d.)
3. NAGAS 2018 [37] 21 years, teeth 2.1, 2.2.	2% lidocaine with vc.	Without instrumentation.	20 mL NaOCl 5.25% + 10 mL ss	TAP (metro., cipro., clinda.) (1:1:1)	Mepivacaína 2% sen vc.	5.25% NaOCl + 10 mL a distilled water. + 17% EDTA 1 min.	Scaffold: BC.	MTA	Compo.	3 sessions (4 w.; 1 w.)

4. PRASAD 2017 [39] 12 years,		Minimal mecanic instrumentation.		TAP (metro., cipro., mino.) (1:1:1)		ss	Scaffold: bioglass. Stem		GIC	2 sessions (2 d.)
5. SAOUD 2016 [38] 16 years,	*Supplemental Table 8.*									

Anesthesia: vc: Vasoconstrictor.
Irrigation: NaOCl: Sodium Hypochlorite; EDTA: Ethylenediamine Tetraacetic Acid.
Intracanal dressing: TAP: Triple Antibiotic Paste; cipro: Ciprofloxacine; metro: Metronidazole; mino: Minocycline; doxy: Doxycycline; clyn: Clyndamycin.
Tissue engineering: BC: Blood Clot; SHED: Stem cells derived from human exfoliated deciduous teeth.
Coronal barrier: MTA: Mineral Trioxide Aggregate.
Final restoration: GIC: Glass-Ionomer Cement; compo: Composite.

Supplemental Table 8. Clinical Protocol in the Case Reports included in the Review (mature teeth with perforation).

First author, Year, Population		CORDERO 2020 [35] 19 years, tooth 1.2	SAOUD 2016 [38] 16 years, tooth 1.1
1st session	Anesthesia	2 mL 2% lidocaine with vc.	Without anesthesia.
	Instrumentation	Manual.	Manual.
	Irrigation	20 mL 2.5% NaOCl.	NaOCl.
2/3rd session	Anesthesia	2nd session: perforation sealing 3nd session: 2 mL 2% Lidocaine	2ª session: ?
	Instrumentation	Manual.	Manual.
	Irrigation	20 mL 2.5% NaOCl 5 min. + 20 mL 17% EDTA 5 min. Without	NaOCl. Without activation.
	Intracanal dressing	CH.	TAP (metro., cipro., mino.).
3/4rd session	Anesthesia	4ª session: 2 mL 3% mepivacaine	3ª visita: mepivacaína 3% sen vc.
	Irrigation	20 mL 17% EDTA 3 min. Without	17% EDTA. Without activation.
	Tissue engineering	Scaffold: BC. Stem cells: PPP UC-MSC	Scaffold: BC.
	Coronal barrier	Hemostatic sponge + Biodentine.	MTA.
	Final restoration	GIC + Compo.	ZOE + compo.
Number of sessions and interval		4 sessions (1 w., ?; 2 w..).	3 sessions (2 w., 2 w.).

Anesthesia: vc: Vasoconstrictor.
Irrigation: NaOCl: Sodium Hypochlorite; EDTA: Ethylenediamine Tetraacetic Acid.
Intracanal dressing: TAP: Triple Antibiotic Paste; cipro: Ciprofloxacine; metro: Metronidazole; mino: Minocycline; CH: Calcium Hydroxide.
Tissue engineering: BC: Blood Clot; PPP: Platelet-Poor Plasma; UC-MSCs: Umbilical Cord Mesenchymal Stem Cells;.
Coronal barrier: MTA: Mineral Trioxide Aggregate.
Final restoration: GIC: Glass Ionomer Cement; ZOE: zinc oxide eugenol; Compo: Composite.

Supplemental Table 9. Outcomes obtained through the Case Reports included in the Review (mature teeth).

First author, Year, Population		Outcomes at month 12			Outcomes at last follow-up			Follow-up Period	Clinical and Radiographic exams	Adverse effect
		Primary Outcome		Secondary Outcome	Primary Outcome		Secondary Outcome			
		Evidence of bony healing	Absence of symptoms	Sensitivity/ Vitality testing	Evidence of bony healing	Absence of symptoms	Sensitivity/ Vitality testing.			
1. CORDERO 2020 [35] 19 years, tooth 1.2		Yes.	Yes.	+				1,6, 12 m.	- CBCT. - Rx. - Sensitivity test (cold	No.
2. ARSLAN 2019 [36] 20 years	Tooth 1.1	Complete resolution.	Yes.	+	Yes.	Yes.	Not evaluated.	12, 36 m.	- Rx. - Sensitivity test (electric)	No.
	Tooth 1.2	Yes.	Yes.	+	Yes.	Yes.	Not evaluated.	12, 36 m.	- Rx. - Sensitivity test (electric)	No.
3. NAGAS 2018 [37] 21 years	Tooth 2.1	Yes.	Yes.		Complete resolution.	Yes.	-	1, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60 m.	- Rx. - Sensitivity test (cold	No.
	Tooth 2.2	Yes.	Yes.		Complete resolution.	Yes.	-	1, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60 m.	- Rx. - Sensitivity test (cold	No.
4. PRASAD 2017 [39] 12 years	Tooth 3.1	Yes.	Yes..	+ (3m.).				1 w; 1, 3, 12 m.	- Rx. - Sensitivity	No.
	Tooth 4.1	Yes.	Yes.	+ (3m.).				1 w; 1, 3, 12 m.	- Rx. - Sensitivity	No.
5. SAOUD 2016 [38] 16 years, tooth 1.1					Yes.	Yes.	-	8, 15, 19 m.	- Rx. - Sensitivity	No.

LDF: Laser Doppler Flowmetry; MR: magnetic resonance imaging; rx: periapical radiography; CBCT: cone beam

Supplemental Table 10. Clinical Protocol in the Case Reports included in the Review (immature teeth).

First author, Year, Population	1st session				2nd session				2/3rd sessio	N u mbe r of sess ions and
	Anesthesia	Instrumentation, Apical Diameter	Irrigation	Intracanal dressing	Anesthesia	Irrigation	Tissue engineering	Coronal barrier	Final restoration	
1. ARORA 2020 [40] 16 years, tooth 4.7.	2% Lidocaine with vc.	Manual (#30 M, #80 D k-files).	5mL 3% NaOCl + ss.	TAP (Cipro., Metro.,	2% Lidocaine with vc.	10mL 3% NaOCl + 10mL ss + 10mL EDTA.	Scaffold: M: CS / D: PRF.	MTA.	3rd session: GIC + compo..	3 sessions (3 w., 1
2. NIVETHITHA 2020 [41] 23 years, tooth 1.2.		Manual (#80 k-files).	20 mL 1.5% NaOCl + ss.	CH.	2% Lidocaine without vc.	10mL 17% EDTA.	Scaffold: BC. Growth factor: CGF.	MTA.	2nd session: compo.	2 sessions (3 w.).
3. KANDEMIR 2020 [42] 14 years,	Without anesthesia.	Manual (#80 k-files).	20 mL 1.5% NaOCl +	TAP (Cipro., Metro.,	3% Mepivacaine without vc.	17% EDTA.	Scaffold: BC + PRF.	MTA.	3rd session: compo.	3 sessions (3 w.; 3
4. NAGAVENI 2020 [43] Tooth 1.2.	2% Lidocaine with vc.	Manual (#70 k-files).	10 Ml 5.25% NaOCl.	TAP (Cipro., Metro., Mino.).		ss.	Scaffold: PRF.	MTA.	3rd session: GIC.	3 sessions (1 w., 1 d.)
4. NAGAVENI 2020 [43] Tooth 2.2.							Scaffold: BC.			
5. BROGNI 2020 [44] 21 years, tooth 1.1.	2% Mepivacaine with vc.	Manual (#110 k-files).	2% CHX + ss.	CH.	2% Mepivacaine without vc.	3 mL 17% EDTA 5 min. + 3 mL ss 1	Scaffold: BC.	MTA.	2nd session: Citodur + compo.	2 sessions (3 w.
6. ANTOV 2019 [45] 15 years, tooth	Local anesthesia with vc.	?	0.5% NaOCl.	DAP (Metro., Cipro).	Local anesthesia	0.5% NaOCl.	Scaffold: BC.	MTA.	2nd session: GIC + compo.	2 sessions (4 w.)
6. ANTOV 2019 [45] 14 years, tooth						0.5% NaOCl + 17% EDTA.		Portland cement.		
7. ADHIKARI 2018 [46] 29 years, tooth 1.2.	2% Lidocaine with vc.	Manual (H-files).	20 mL NaOCl 3% 5 min. + 20 mL EDTA 17%	CH.		20 mL 3% NaOCl 5 min. + 20 mL 17% EDTA 5 min.	Scaffold: PRF.	MTA.	3rd session: compo.	3 sessions (4 w.; 1 d.)

8. SURESH 2018 [47] 18 years, tooth 1.1.	2% Lidocaine with vc.	Manual (#80 k-files).	20 mL NaOCl 1% Activation: negative	CH.		ss +20 mL 1% NaOCl + 20 mL 17% EDTA. Activation: negative pressure	Scaffold: HAM.	Biodentine.	2nd session: GIC + compo.	2 sessions (1 m.)
9. AUNMENTONG 2018 [48] 15 years.	Supplemental *Table 11*.									
10. PLASCENCIA 2017 [49] 11 years.	2% Lidocaine with vc.	Manual (k-files).	20 mL 3% NaOCl.	CH.	Local anesthesia	10 mL 1% NaOCl.	Scaffold: BC.	MTA.	3rd session: compo.	3 sessions (2 w.; 1
11. PRASAD 2018 [50] 13 years	Tooth 1.1,1.2.	3% Mepivacaine with vc.	Manual (H-files).	20 mL 1.5% NaOCl + 20 mL ss. 5 min.	TAP(Cipro., Metro., Mino.).		1.5% NaOCl + ss + 20 mL EDTA 1 min.	Scaffold: PRF.	Hemostatic sponge + MTA.	3rd session: GIC.	3 sessions (2 w.; 1 d.)
	Tooth 2.1,2.2.							Scaffold: PRP.			
12. PINTO 2017 [51] 20 years, tooth 2.2.	2% Lidocaine with vc.	No instrumentation.	20 mL 1.5% NaOCl 5 min + 20	CH.	3% Mepivacaine without vc.	20 mL 17% EDTA 3 min.	Scaffold: L-PRF.	Bioceramic (Totalfill, FKG).	2nd session: GIC.	2 sessions (3.)
13. PRASAD 2017 [39] 12 years, tooth 1.1.		Manual (k-files).	ss.	No.			Scaffold: Bioglass. Stem cells: SHED.	No.	GIC.	1 session
14. BAKHTIAR 2017 [52] 18 years, tooth 1.2.	2% Lidocaine with vc.	Manual (#40 H-files).	20 mL 1.5% NaOCl 5 min +	TAP (Cipro., Metro., Cefla.)	3% Mepivacaine without vc.	20 mL 17% EDTA.	Scaffold: BC + PRF.	Biodentine.	GIC.	2 sessions (2-3 w.)
15. AL-TAMMAMI 2017 [53]	2% Lidocaine with vc.	No instrumentation.	ss + 20 mL 5.25 %	DAP (Cipro., Metro.).	3% Mepivacaine without vc.	20 mL 1.5% NaOCl 5 min + ss + 10 mL	Scaffold: BC.	Hemostatic sponge + MTA.	3rd session: compo.	3 sessions (2 w.; 1
16. GAVIÑO 2017 [54] 35 years, tooth 1.1. 21 years,	Without anesthesia.	Manual (#70 H-files)	10 mL 5.25 % NaOCl	TAP (Cipro., Metro., Mino.)	3% Mepivacaine without vc.	ss + 20 mL 1.5% NaOCl 10 min. + ss.	Scaffold: PRP.	Hemostatic sponge + MTA.	3rd session: internal bleaching + compo.	3 sessions (2 w.; 1 w.)

Anesthesia: vc: vasoconstrictor.
Instrumentation: M: mesial canal; D: distal canal.
Irrigation: NaOCl: Sodium Hypochlorite; EDTA: Ethylenediamine Tetraacetic Acid. ss: saline solution; CHX: chlorhexidine.
Intracanal dressing: TAP: Triple Antibiotic Paste; PDA: Double Antibiotic Paste; cipro: Ciprofloxacine; metro: Metronidazole; mino: Minocycline; doxy: Doxycycline; clyn: Clyndamycin; Cefla: Ceflacor; CH: Calcium Hydroxide.
Tissue engineering: BC: Blood Clot; PPP: Platelet-Poor Plasma; UC-MSCs: Umbilical Cord Mesenchymal Stem Cells; PRF: platelet-rich fibrin; PRP: platelet-rich plasma) L-PRF : leukocyte platelet-rich fibrin; CGF: fconcentrated growth factor) HAM: human amniotic membrane; SHED: stem cells derived from human exfoliated deciduous teeth.

Supplemental Table 11. Clinical Protocol in the Case Reports included in the Review (immature teeth).

First author, Year, Population	1st session				2nd session				3rd session			4rd sessio	Number of visits and
	Anesthesia	Instrumentation	Irrigation	Intracanal dressing	Anesthesia	Instrumentation	Irrigation	Intracanal dressing	Irrigation	Scaffold	Coronal barrier	Final restoration	
AUNMENTONG 2018 [48] 15 anos, dente 21	2% Lidocaine with vc.	Manual (#40 K-file).	0.9% ss + 5% NaOCl.	CH.	?	Manual (#40 K-file).	2.5% NaOCl + 10 mL 17% EDTA 1 min. + 0.9% ss + 2% CHX.	CH.	2.5% NaOCl + 10 mL 17% EDTA 1 min. + 0.9% ss + 2% CHX	L-PRF.	Hemostatic sponge + MTA.	Compo.	4 sessions (2 w.; 2 m.; 1 w.).

Anesthesia: vc: vasoconstrictor.
Irrigation: NaOCl: Sodium Hypochlorite; EDTA: Ethylenediamine Tetraacetic Acid. ss: saline solution; CHX: chlorhexidine.
Intracanal dressing: CH: Calcium Hydroxide.
Tissue engineering: L-PRF : leukocyte platelet-rich fibrin.
Coronal barrier: MTA: Mineral Trioxide Aggregate.
Final restoration: compo: Composite.

Supplemental Table 12. Outcomes obtained through the Case Reports included in the Review (immature teeth).

First author, Year, Population		Outcomes at month 12					Outcomes at last follow-up					Follow-up Period	Clinical and Radiographic exams	Adverse effect
		Primary Outcome		Secondary Outcome		Tertiary Outcom	Primary Outcome		Secondary		Tertiary Outcom			
		Increased root	Increased root length and/	Evidence of bony healing	Absence of symp to	Sensitivity/ Vitality testing.	Increased root wall	Increased root length and/	Evidence of bony healing	Absence of symp to	Sensitivity/ Vitality testing.			
1. ARORA 2020 [40] 16 years, tooth 4.7							Yes.	Yes. Apical closure.	?	Yes.	No.	3, 6, 12, 24, 36, 60 m.	– Rx. – Sensitivity test (cold).	No.
2. NIVETHITHA 2020 [41]	23 years, tooth	Yes.	Yes. Apical closure.	Yes.	Yes.							12 m.	– CBCT. – Rx.	No.
	21 years, tooth	Yes.	Yes.	Yes.	Yes.							12 m.	– CBCT. – Rx.	No.
	14 years, tooth 1.2						No.	No.	Yes.	Yes.	No.	36 m.	– CBCT. – Rx. – Sensitivity test (cold and electric).	No.

3. KANDEMIR 2020 [42]	14 years, toth 1.1						No.	No.	Yes.	Yes.	No.	36 m.	– CBCT. – Rx. – Sensitivity test (cold and electric).	No.
	13 years, toth 1.1						No.	No.	Complete resolution.	Yes.	No.	36 m.	– CBCT. – Rx. – Sensitivity test (cold and electric).	No.
4. NAGAVENI 2020 [43] 11 years.	Tooth 1.2	Yes.	Yes. Apical closure.	No previous lesion.	Yes.	Yes.						1,3, 6, 9 12 m.	– Rx. – Sensitivity test (cold and electric).	No.
	Tooth 2.2	Yes.	Yes.	No previous lesion.	Yes.	Yes.						1,3, 6, 9, 12 m.	– Rx. – Sensitivity test (cold and electric).	No.
5. BROGNI 2020 [44] 21 years, dente 1.1		Yes.	No.	Yes.	Yes.		Yes.	No.	Complete resolution	Yes.	?	6, 12, 15, 24	– Rx.	No.

6. ANTOV 2019 [44]	15 years, tooth 1.1						Yes.	No.	No previous lesion.	Yes.	Yes.	4, 10, 18, 32, 54, 78 m.	– Rx. – Sensitivity test (cold and electric).	Discoloration.
	14 years tooth 2.1	No.	No.	Yes.	Yes.	No.	No.	No.	Yes.	Yes.	No..	12, 24 m.	– Rx. – Sensitivity test (cold and electric).	Discoloration.
7. ADHIKARI 2018 [46] 29 years, tooth 1.2		Yes.	Yes. Apical closure.	Yes.	Yes.							1,6, 12 m.	– Rx. – Histopathologic Analysis.	No.
8. SURESH 2018 [47] 18 years, tooth 1.1							Yes.	No.	Yes.	Yes.	Yes.	15 d.; 3, 19, 36 m.	– Rx. – CBCT. – Sensitivity test (cold, electric)..	No.

9. AUNMENTONG 2018 [48] 15 years, tooth 2.1		Yes.	Yes. Apical closeure.	Yes.	Yes.	Yes.						3, 6, 12 m.	– Rx. – CBCT. – Sensitivity test (electric).	Discoloration.
10. PLASCENCIA 2017 [49] 11 years, tooth 2.2							Yes.	Yes. Apical closeure.	Yes.	Yes.	No.	32m.	– Rx. – Sensitivity test (cold).	Discoloration.
11. PRASAD 2018 [50] 13 years	Tooth 1.1						Yes.	Yes.		Yes.		1, 6,12 ,18, 24 m	– Rx. – CBCT.	No.
	Tooth 1.2						Yes.	Yes.		Yes.		1, 6,12 ,18, 24 m	– Rx. – CBCT.	No.
	Tooth 2.1						Yes.	Yes.		Yes.		1, 6,12 ,18, 24 m	– Rx. – CBCT.	No.
	Tooth 2.2						Yes.	Yes.		Yes.		1, 6,12 ,18, 24 m	– Rx. – CBCT.	No.
12. PINTO 2017 [51] 20 years, tooth 2.2		Yes.	Yes.	Yes.	Yes.	Yes.						6, 12 m.	– Rx. – CBCT. – Sensitivity test (electric, cold). – LDF.	No.

13. PRASAD 2017 [39] 12 years, tooth 1.1		Yes.	Yes. Apical closure.	Yes.	Yes.	Yes.						1 w.; 1, 3, 6, 12 m	– Rx – Sensitivity test (electric).	No.
14. BAKHTIAR 2017 [52] 18 years, tooth 1.2		Yes.	Yes. Apical clos	Yes.	Yes.							1, 3, 6, 12, 18	– Rx.	Discoloration.
15. AL-TAMMAMI 2017 [53] 12 years, tooth 1.1		No.		Yes.	Yes.		No.	No. Apical closure.	Yes.	Yes.		3, 6, 12 36 m;	– Rx. – CBCT.	No.
16. GAVIÑO 2017 [54]	35 years, tooth 1.1						No.	No.	Yes.	Yes.	No.	1,2, 6, 12, 24, 36, 50 m.	– Rx. – CBCT. – Sensitivity test (cold).	Discoloration.
	21 years, tooth 1.1						No.	Yes.	Yes.	Yes.	No.	1,2, 6 , 12, 24, 36, 50 m.	– Rx. – CBCT. – Sensitivity test (cold).	No.
	24 years, tooth 2.2						No.	No.	Yes.	Yes.	No.	1,2, 6 , 12, 24, 36, 50 m.	– Rx. – CBCT. – Sensitivity test (cold).	No.

LDF: Laser Doppler Flowmetry; rx: periapical radiography; CBCT: cone beam computed tomography; d: days; w:

Supplementary File 3. Clinical Considerations for Regenerative Endodontic Procedures in Mature and Immature Adult Teeth.

1. Case selection.
1.1. Patients not allergic to medicaments or materials needed to perform the procedure.
1.2. Patients ASA 1 or 2.
1.3. Adult mature or immature necrotic tooth with or without periapical pathology.
1.4. Compliant patient (it is necessary to attend the appointments in the indicated periods).

2. Informed consent. It should include:
2.1. Number of appointments (2 or 3, generally).
2.2. Follow-up period.
2.3. Possible complications and adverse effects: crown discoloration, pain, infection, inflammation or treatment failure.
2.4. Treatment alternatives:
2.5.1. Mature tooth: root canal treatment; tooth extraction.
2.5.2. Immature tooth: MTA apexification; tooth extraction.
2.5. It should be explained that, depending on patient's age, the treatment would be more os less predictable. The alternatives if failure occurs are:
2.6.1. Mature tooth: REP retreatment through cell transplant; root canal treatment.
2.6.2. Immature tooth: REP retreatment through cell transplant; MTA apexification.

3. First appointment
3.1. Local anesthesia, dental dam isolation and access.
3.2. Root canal instrumentation:
3.2.1. Mature tooth: reciprocation system technique, to an apical diameter of minimum 0.30 mm.
3.2.2. Immature tooth: minimum manual instrumentation with K or H files.
3.3. Irrigation technique:
3.3.1. 1.5% NaOCl (20mL/canal, 5 minutes) activated with an apical negative pressure irrigation system.
3.3.2. EDTA (20mL/canal, 5 minutes).
3.4. Dry canals with paper points.
3.5. Place calcium hydroxide.
3.6. Seal with a temporary restorative material.

4. Second appointment: 2-3 weeks after first visit.
4.1. Assess response to initial treatment: clinical evaluation to assess resolution of symptoms. If sensitivity to palpation or percussion tests, low concentration of antibiotic mixture may be placed, avoiding tetracyclines.
4.2. Local anesthesia without vasoconstrictor and dental dam isolation.
4.3. Remotion of intracanal medication: 20 mL17% EDTA.
4.4. Dry canals with paper points.
4.5. Scaffold:
4.6.1. Create bleeding into canal system by over-instrumenting (rotating a k-file at 2 mm past the apical foramen).
4.6.2. If a suitable blood clot is not obtained: apply platelet-rich concentrates.
4.6. Optional: place a resorbable matrix over the blood clot.
4.7. Coronal barrier: 3-4 mm layer of white MTA or Biodentine, 2-3 mm under the dentin-enamel junction.
4.8. Definitive seal. In the same appointment if Biodentine was applied as coronal barrier, or in a third appointment if MTA was chosen.

5. Follow-up (3 and 6 month, and every year until 5 years). It should be observed:
5.1. Abscense of symptoms and no apical radiolucency.
5.2. In case of immature tooth, increased root wall length and width and/or apical closure.
5.3. Desirable, but not essential: Positive response to sensitivity testing.