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Editorial

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Biological consideration for nonsurgical repair of furcation perforation

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Editorial

Root perforation is an artificial opening occurs in the pulp wall creating communication between the pulp and the exterior. Traumatic (iatrogenic) perforations are due to lack of attention given to details of dental anatomy and failure to consider its variations by the clinician. Furcation perforation usually occurs due to careless access preparation where the bur is not properly angulated with to the long axis of the tooth.[1] Detection of existing perforation can be observed as sensitivity to percussion, presence of serous exudates in the perforation site, and gingival chronic inflammation. In addition, problems as pocket formation, presence of a sinus tract or furcation involvement following root canal treatment may indicate the existence of furcation perforation.[1]

There are several factors that affect the prognosis of endodontically treated tooth with furcation perforation. These factors are time elapsed before filling the defect, size of the perforation, its location and type of the repair material and its ability to seal the perforation. Different materials have been suggested for nonsurgical repair of furcation perforation such as amalgam, calcium hydroxide, gutta percha, and MTA (Mineral trioxide aggregate). Extrusion of repair material into the periodontal space can be controlled using bio inert matrices such as indium foil, dentin chips and calcium hydroxide. In addition, perforations can be filled with blood or Teflon discs whereas hydroxy apatite or tricalcium phosphate matrix can be used without internal matrix.[2]

Since the objective of repairing furcation perforations is sealing the dentin defect to provide appropriate conditions for new periodontal attachment, there is no single restorative material can achieve this objective. Some materials may provide adequate seal but they will not help the formation of periodontal reattachment due to their extrusion into the furcation area. Obviously, periodontal reattachment will not occur when perforation is repaired with gutta percha, amalgam, or calcium hydroxide. On the other hand, materials such as hydroxyapatite or plaster of Paris may help with the formation of bone regeneration and periodontal attachment but will not adequately seal the dentin defect. This may result in bacterial leakage and failure, especially the perforation is connected to the oral cavity.[3]

The new concept of the artificial floor in the repair of furcation perforation is based on the heterogeneous nature of the perforation wound. Perforation of the pulp chamber floor involves different types of inter-related tissues and each tissue within the defect should be considered independently. We introduced the artificial floor technique for repairing furcation perforations considering the periodontal wound and the dentinal wound as separate identities.[3,4] The concept of this technique is different from the internal matrix used in repairing the furcation perforation. Internal matrix is a passive technique used to compensate for the missing wall for a cavity and has no roll in regeneration process whereas the artificial floor is an active technique that plays a role in the regeneration process.

Medical grade of calcium sulfate hemi-hydrate (CSH) is an example for the artificial floor material that can be used under dentin restorative material such as glass ionomer. CSH is a biocompatible and stable material that is readily available, easily sterilized, and shows a rate of resorption coinciding with the rate of bone regeneration. It provides a ready source of calcium ions for early bone mineralization and accelerates the mineralization rate for the new bone.CSH artificial floor helps in avoiding the formation of periodontal pockets and allows for periodontal reattachment because it acts as bone barrier that guides bone regeneration and excludes epithelial tissue from the site of bone formation. Although other materials can be used as artificial floor, CSH is recommended for that purpose.[4]

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Conflicts of interest

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