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Management of immature permanent necrotic teeth treated by revascularization using mineral trioxide aggregate: Case series

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The treatment of necrotic immature permanent teeth could be a challenge to clinicians. Because of their thin root walls, nonvital immature teeth are susceptible to fracture. Regenerative endodontic treatment has been considered effective procedure for these cases. Revascularization has the potential to promote continued root development and maintain vitality. This case report presents successful management of a nonvital tooth treated by revascularization using mineral trioxide aggreate (MTA). A 10-years-old boy was referred to the Restorative Dentistry and Endodontics Department with chief complaint of spontaneous pain on right lower second premolar (#45). The pain started 1 month ago. His medical history was not significant. Intraoral examination revealed that negative response to ice and EPT, and had tenderness to percussion. Radiographic exmaination of tooth #45 showed the immature apex and a periapical radiolucency. Based on the preoperative data, tooth #45 was diagnosed pulp necrosis with symptomatic apical periodontitis. The treatment plan was to attempt vascularization of tooth #45. But the revascularization could be failed, and MTA apexification was considered as second choice of treatment. Under the local anesthesia, the rubber dam was applied. The pulp chamber was accessed and irrigated with 20 mL 2.25% sodium hypochlorite (NaOCl) solution without any preparation using endodontic files. The canal was dried with paper points. The 3 mix antibiotic paste (Metronidazole, Ciprofloxacin, and Minocyclin in the proportion of 1:1:1) was placed and the temporary materials were placed. After three weeks, patients re-visited the clinic and the intraoral examination was done. Patients had no tenderness to percussion and no further pain or discomfort. The rubber dam was applied and the tooth was re-entered. To induce bleeding, a sterile #10 K file was used. After 15 minutes, when blood clot was formed up to level of the CEJ, MTA ProRoot MTA, Dentsply, Tulsa, OK, USA) was placed without pressure. The wet cotton was placed over the MTA and the tooth was filled with temporary material. The next day the patient returned for the permanent restoration of this tooth. The patients was reclled 3, 6, 20 months and 6.8 years after the treatment. In clincial examination, the tooth was asymptomatic, and had positive reponse to ice and EPT. According to radiographic examination, the root length and width was increased and the apical closure was completed. The second case was another revascularization of nonvital immature tooth. In this case, the tooth has also shown fully developed root without any symptom after the treatment. In two cases, the revascularized teeth was maintained and functioned succesfully without any discomfort up to about seven years. The outcome of the case series suggests that the revascularization procedure to nonvital immature teeth could provide excellent advantage of increased length and width of the root, and could be considered as a first choice of treatment.

Biography

Young Eun Jang works at the Ewha Womans University Hospital in Department of Conservative Dentistry and Endodontics as a Fellow Doctor.

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