Calcium silicate-based cements in endodontic management of external root resorption

Gianni Di Giorgio[1], Alessandro Salucci[1], Flavia Iaculli[2], Maurizio Bossù[1]

[1] Department of Oral and Maxillofacial Science, "Sapienza" University of Rome, Via Caserta, 6, 00161 Rome, Italy;
[2] Department of Neuroscience and Reproductive and Odontostomatological Sciences, University of Naples "Federico II", Naples, Italy.

Objective: External root resorption is a pathologic process involving the permanent dentition, mainly due to the injury of root surface. Avulsion and reimplantation of a permanent tooth are strictly related to the occurrence and progression of tooth tissue loss and external root resorption. Therefore, the aim of the present study was to endodontically treated a traumatized tooth presenting root resorption using calcium silicate-based cements.

Materials and Methods: Two immature permanent teeth, 11 and 21, were subjected to trauma and reported uncomplicated crown fracture and avulsion and complicated crown fracture, respectively. Both elements were diagnosed with necrotic pulp and tooth 11 showed early external root resorption due to reimplantation. Endodontic treatment and root closure with apical plug using a calcium-silicate-based cement, namely mineral trioxide aggregate (MTA), was obtained in both dental elements.

Results: After 6 months, root resorption seemed to be arrested. Twenty-four months after trauma the clinical results were stable; however, clinical and radiographical signs and symptoms of ankylosis involving tooth 11 could be appreciated.

Conclusions: Apical plug obtained using a bioactive calcium silicate-based cement seemed to reduce the resorption rate when compared to the early stages, allowing a better clinical prognosis over time. Further studies with a larger sample size and a longer follow-up period are needed to establish the potential of calcium silicate-based cement to promote the deposition of a mineralized tissue and to contrast the progression of resorption process.

Apical plug; calcium silicate-based cements; external root resorption; trauma.