



## **OrthoMTA™ A Newly Developed Mineral Trioxide Aggregate (MTA) Cements in Outpatients Attending Public Oral Health Korean Adolescents**

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### **Dear Editor-in-Chief**

Biomaterials science is in the midst of the largest transition in its history in terms of refocusing and embracing new and exciting technologies. “For older academics or clinicians, this change might be viewed as the death of conventional dental materials, but for most others, this is the birth of true biomaterials” (1).

Mineral trioxide aggregate (MTA) was developed at Loma Linda University as root-end filling material. A study suggested MTA apexification to replace calcium hydroxide apexification (2). Using MTA apexification can be carried out in single visit, which is advantageous over traditional calcium hydroxide apexification, which requires variable treatment duration ranging from 5 to 20 months and poor patient compliance with follow-up (3). Knowing the particular qualities of materials can aid the clinician in choosing those that are appropriate for a given situation (4). New materials, such as OrthoMTA (BioMTA, Seoul, Korea) are newly developed MTA cement for root canal obturation (5).

The purpose of this study was to compose formally documents of the case of the MTA application developed in South Korea as the root canal obturation material. The literature review was performed using a Medline electronic search. The cut-off date was the end of Nov 2014. The keywords used and the results of this search are shown in Table 1.

Totally, 55 cases in 29 patients were treated with OrthoMTA root canal treatment procedures in pediatric department of Wonkwang University Sanbon Dental Hospital between 2010 and 2013. Recall intervals were approximately 3 months, and we followed all the cases for as long as possible. Standardized radiographic projection using the parallel cone technique with the aid of a Rinn holder (Dentsply Rinn) was taken at each follow-up visit.

The aim of radiographic evaluation was to characterize the continued root formation of the involved tooth and the presence or absence of radiographic signs of periarticular bone destruction. Two other calibrated, blinded examiners eva-

luated all radiographs. Examiner agreement was assessed using Kappa–Cohen tests. If there were one or more clinical symptoms such as continuous pain or percussion, onset of new apical

lesions and blennorrhoea formation, it was determined as a clinical failure and if there were no such symptoms, it was determined as a clinical success.

**Table 1:** The keywords searched on Medline at the end of Nov 2014 and the number of publications found

Keyword	Number of publications	Earliest paper	Latest paper
Mineral trioxide aggregate	1525	Nov 1993	Nov 2014
Mineral trioxide aggregate composition	65	July 1995	Sep 2014
Mineral trioxide aggregate constitution	7	April 2005	Aug 2012
Mineral trioxide aggregate biocompatibility	142	Nov 1995	Oct 2014
Mineral trioxide aggregate cells	294	Oct 1995	October 2014
Mineral trioxide aggregate tissue response	101	Dec 1995	Sep 2014
Mineral trioxide aggregate properties	276	July 1995	Sep 2014

Radiological successes were categorized into success and failure result by assessing apical radiographs and assessment criteria were as follows. If there was normal periodontal ligament space, apical lesions were reduced compared to the radiographs taken before the procedure, and no inflammatory external resorption was shown, then it was determined as a radiological success. Even with remaining extensive radiolucent images in apical area, if locally expanded periodontal ligament space was observed and thus it seemed to be scar tissues rather than continuous apical lesions and inflammatory external resorption was not seen, it was also regarded as a success. When the expansion of apical lesions was obvious, new lesions clearly occurred after root canal filling, or continuous symptoms of external root resorption were observed, it was determined as a radiological failure.

Of the 55 cases, 24 teeth are #21, 23 teeth are #11, 4 teeth are #22, 3 teeth are #12 and 1 tooth is #31. Forty-five teeth in 24 patients were available for recall. The range of recall was from 3 to 45 mo after treatment, with a mean time of 12.4 months. The age range of patients was from 7 to 14 yr, with a mean age of 10.1 yr. During the ob-

servation period, a clinical success was observed in 44 (97.8%) teeth and a radiological success was observed in 41 (91.1%) teeth.

Long-term follow-up of patients is important because pathological changes can occur several years following injury. So far, for the patient, newly developed mineral trioxide aggregate (MTA) cements; OrthoMTA™ appears to have been a valid option for root end filling materials of immature permanent teeth, with the added advantage of speed of completion of therapy. However, MTA conceivably could replace calcium hydroxide as the material of choice for root canal treatment procedures, further histological investigations are required to confirm favorable outcomes after the use of this technique.

OrthoMTA™ is induced by the root canal filling materials of the complete root formative teeth and developed root state teeth in children and young adolescents.

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