



# OrthoMTA

## Root Filling Kit™

BioMTA

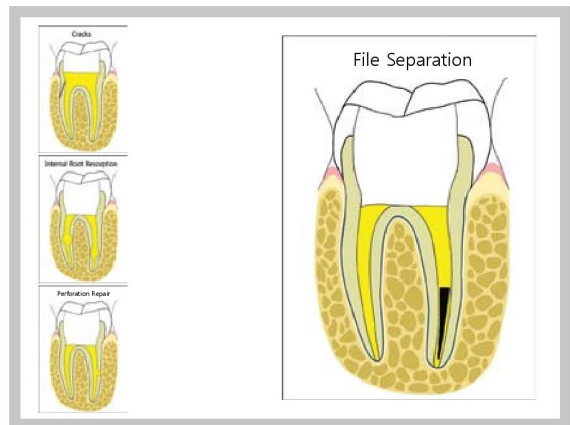
# What is OrthoMTA?

OrthoMTA is an orthograde root canal filling material that was synthesized by mineral trioxide aggregate's active ingredient through Bio-ceramic manufacturing process. It was formulated to meet the ideal requirements of root canal filling material necessary for a clinically effective root canal treatment on cases of file separation, cracked tooth, severely infected canal, and retreatment of acute apical abscess.

OrthoMTA is a root canal filling material that is proven for remarkable long-term clinical success rate.

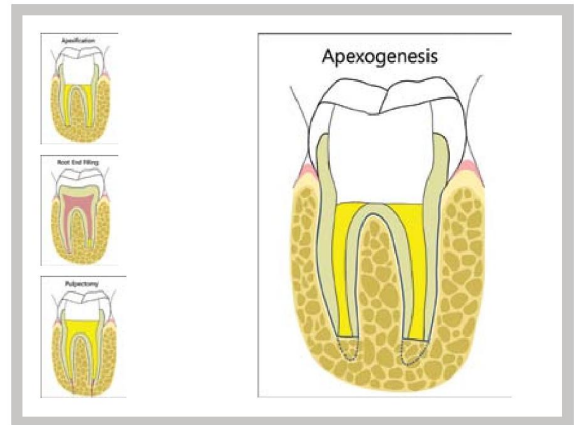
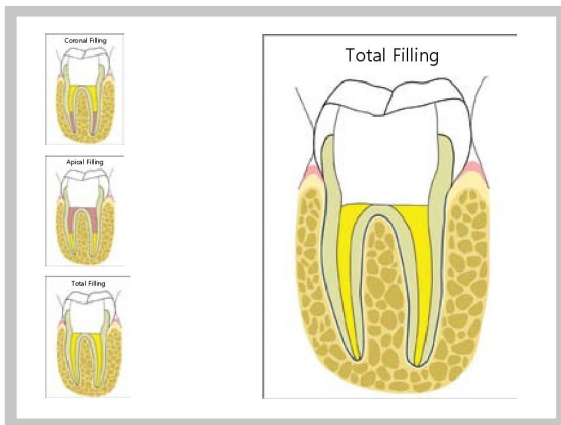


# Root Canal Filling Material

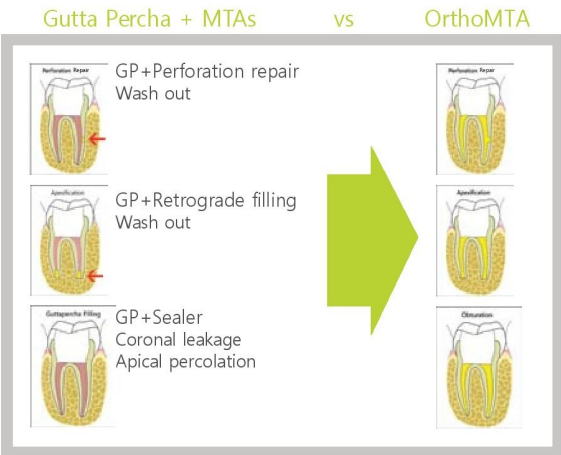


## Root Canal Filling Material

## Root Regeneration



# Rationale of OrthoMTA Grafting



Failure of Setting of Mineral Trioxide Aggregate in the Presence of Fetal Bovine Serum and Its Prevention. J Endod 2012;38:536-540  
Physical and Chemical Properties of New-generation Endodontic Materials. J Endod 2010;36:524-528

# Root Filling Kit





## PHYSICAL PROPERTIES

Property	OrthoMTA	P MTA
Specific gravity	3.106	-
Surface Area(m <sup>2</sup> /kg)	<b>961</b>	409
Average particle size(µm)	<b>2.62</b>	6.9
90% finer than(µm)	4.64	19.97
50% finer than(µm)	2.36	6.85
10% finer than(µm)	1.18	0.97
Setting time, initial	<b>180 min</b>	74 min
Setting time, final	360 min	210 min

Property	OrthoMTA	P MTA
Particle size(µm) 1)	2.0	6.9
<b>Content of free CaO wt.% 2)</b>	<b>0.66</b>	1.74
Total crystalline phases(%) 3)	96.9	94.3
<b>Expansion coefficient(%) 4)</b>	<b>0.09</b>	2.78
Color	White	Yellow & Gray
Heavy metal	None detected	Cr,As,Ni,Fe,Mn

1) Mastersizer (Malvern co., Ltd. Ver 2.15)

2) KSL 5120

3) Calculated from composition measured by QX-RD (Phillips, PW1710)

4) Measured by Laser displacement sensor Micro Track 7000

## PHYSICAL PROPERTIES of OrthoMTA

- Orthograde root filling material
- Good sealing property and anti-bacterial effect
- Biocompatibility with surrounding tissues
- Good radio-opacity
- No heavy metals (No Cr6+, As, Ni, Fe)
- No expansion (0.09%)
- Easy handling methods
- Retrievability

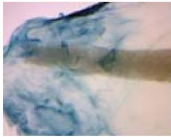
## Composition & Ingredient Information

Component	OrthoMTA	D MTA
3CaO · SiO <sub>2</sub>	76.3	66.1
2CaO · SiO <sub>2</sub>	11.8	6.7
3CaO · Al <sub>2</sub> O <sub>3</sub>	8.0	19.9
4CaO · Al <sub>2</sub> O <sub>3</sub> · Fe <sub>2</sub> O <sub>3</sub>	0.8	1.6
Free CaO	0.7	1.7
Total Crystalline Phase	96.9	94.3

# CONCEPTS

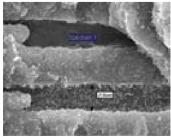
INTRA-TUBULAR Grafting

# Entombment & Fossilization of bacterium in dentinal tubules



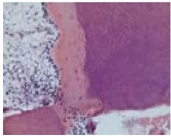
## Physical sealing : Jamming effect

OrthoMTA perfectly seals the root canal space caused by jamming effect which is superior among other sealing materials.



## Chemical sealing : C-S-H & Hap

Short tags of C-S-H obturate the opening of the dentinal tubules which induces entombing effect. Long tags of hydroxyapatite formed achieve fossilization of bacteria.

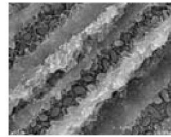


## Biological sealing : New cementum

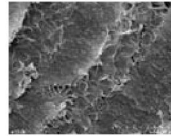
OrthoMTA is a bioactive material that has the ability to regenerate damaged periodontium and achieve biological sealing.



Experimental group (2weeks)  
Initial stages of fossilization of E. faecalis in the infected dentinal tubules was seen.



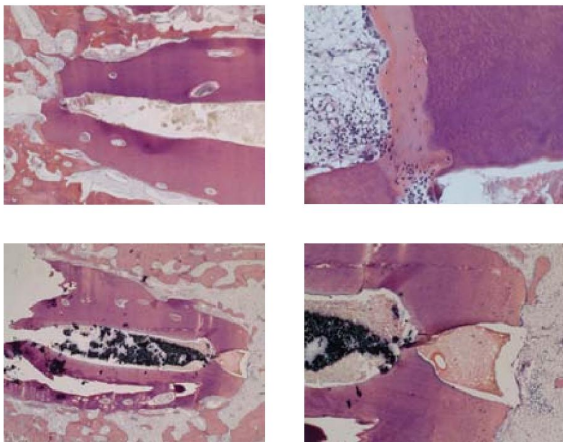
Experimental group (4weeks)  
Fossilization of E. faecalis in the infected dentinal tubules has increased in time.



Experimental group (8weeks)  
There is complete obstruction of the infected dentinal tubules and inter-canalliculi space by the newly formed hydroxyapatite.

Bacterial Entombment by Intratubular Mineralization Following Orthograde Mineral Trioxide Aggregate Obturation; A SEM study. UOS 2014

## NEW CEMENTUM FORMATION



## Orthograde grafting system

### 1 OrthoMTA

OrthoMTA is an innovative orthograde root canal grafting material that is unaffected by moisture or blood contamination.

- World's 1st orthograde bioceramic filling material
- Perfect sealing and biocompatibility
- No heavy metals (No Cr6+, As, Ni, Fe)
- No expansion (0.09%)



0.2g x 50 vials / pack

Effects of Calcium Silicate Endodontic Cements on Biocompatibility and Mineralization-inducing Potentials in Human Dental Pulp Cells. *J Endod* 2014;  
 Analysis of six heavy metals in Ortho mineral trioxide aggregate and ProRoot mineral trioxide aggregate by inductively coupled plasma-optical emission spectrometry. *Aust Endod J* 2013; 39: 126-130  
 Effects of Dental Mineral Trioxide Aggregate on Cellular Reactions Involved in Inflammation and Differentiation. *Biomaterials Research* (2013), 17(1) : 7-12

## 3 CARRIER

OrthoMTA is easy to handle with OrthoMTA Carrier.

- For orthograde or retrograde MTA carrying and filling
- Easy to handle, durable & autoclavable
- Luer Lock syringe system
- Medical grade stainless steel body and NiTi Plunger
- Uses disposable and bendable needle tip to avoid cross-contamination.



## 4 COMPACTER

- World's 1st compacter for delivery of bioceramic material
- Wonderful flexibility : no damage to canal wall
- Autoclavable
- Saves time & material



02 taper #25  
21mm or 25mm  
3ea/pack

## 5 PLUGGER

- For plugging or back-filling of hydrated MTA granules
- Stainless steel tip with Aluminum handle

- 2 types of plugger
  - A plugger - 1.3 mm & 0.3 mm (NiTi)
  - B plugger - 1 mm & 0.5 mm





# 6 ACCESSORY

## Needle Tip

- Bendable with a bender for posterior tooth
- Luer Lock connection with OrthoMTA Carrier
- Medical grade stainless steel with plastic hub
- Gauge 18 needle tip



## Plunger

- Ni-ti tip of the OrthoMTA carrier
- Autoclavable
- Robust and durable



# Orthograde grafting Method

**OrthoMTA** MTA Mineral Trioxide Aggregate  
 Root Canal Orthograde Grafting & Repair Material

**1 Hydration**  
 3mm Distilled water

**2**  
 Remove excess water

**3 Carrier**  
 Gentle tapping motion

**4 H-file #25**  
 Load 3 times

**5 Coat**  
 10 times

**6 Paper point insertion**  
 Plug 10 times

**7 Load**  
 3 times

**8 Plugger**  
 Plug 10 times

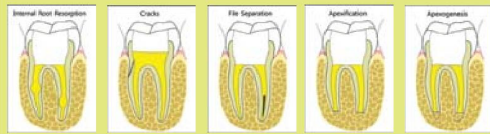
**9 Compacter insertion without rotation**  
 Up to Working length

**10 Reinsertion**  
 Set to 0.5-1.0mm  
 Up and down motion 10 times

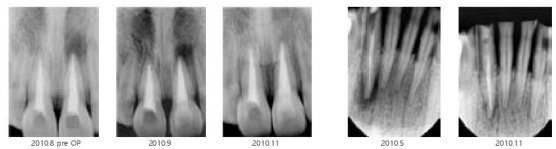
**Coronal compaction**  
 With Plugger  
 Axial plug formation  
 Grasping sensation  
 Up to Working length

OrthoMTA | Hengshan Zhang, D.D., The Institute for Stemming and Regeneration, Korea  
 +82-2-880-1822 | www.biomax.com

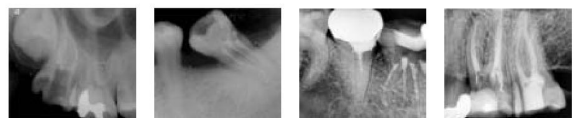
# INDICATION



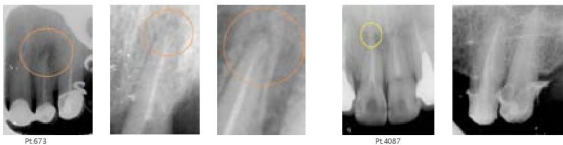
## Root canal obturation



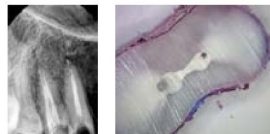
## Curved root canal



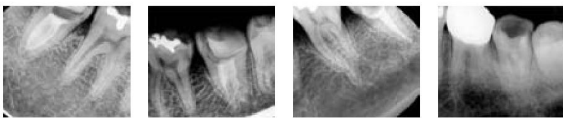
### Y shape canal



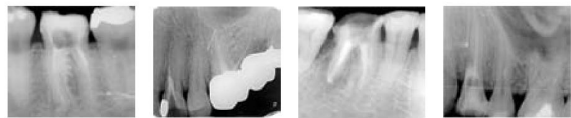
### Isthmus



### C shape canal



### Perforation



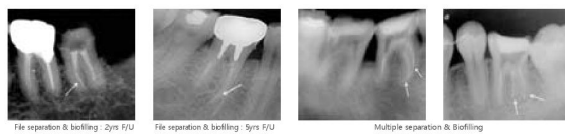
## Root resorption



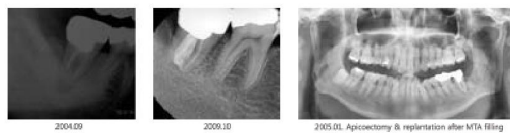
## Crack tooth syndrome



## File separation



## Replantation



## RESEARCH & DEVELOPMENT

### BioMTA

Seoul National University, Research Park Main Center Room #323,

Gwanak ro1, Gwanak-gu, Seoul, Korea 151-919

TEL : 82-2-885-3923 FAX : 82-2-887-3923 E-MAIL : [biomta@biomta.com](mailto:biomta@biomta.com)

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