

Root Repair &
Vital Pulp Therapy

RetroMTA[®]



BioMTA

RetroMTA®

RetroMTA is a hydraulic bioceramic material for root repair and vital pulp therapy. RetroMTA consists of fine, hydrophilic particles that set in the presence of water with its compressive strength reaching up to 105 MPa. It uses Calcium Zirconia complex as radio-opacifier.

Its advantages are rapid setting time of 150 seconds in experimental condition but can be controlled up to 10 minutes by the dentists, no washout, no discoloration and perfect sealing ability. It is efficient when used for replantation, apexification, apexogenesis and REP. In ex-vivo study, initial pH is 11.5 and on the 4th week, it reaches up to pH 7.8~8.0. In in-vivo study, there is high potential for biomineralization.

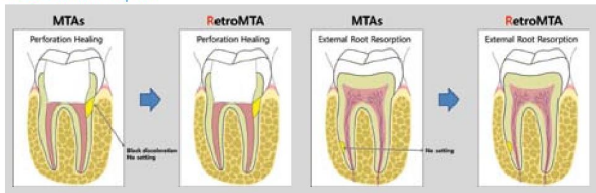


Vital Pulp Therapy & Root Repair

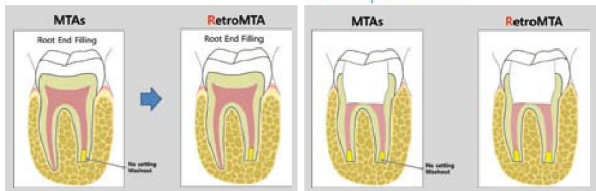


MTAs vs RetroMTA

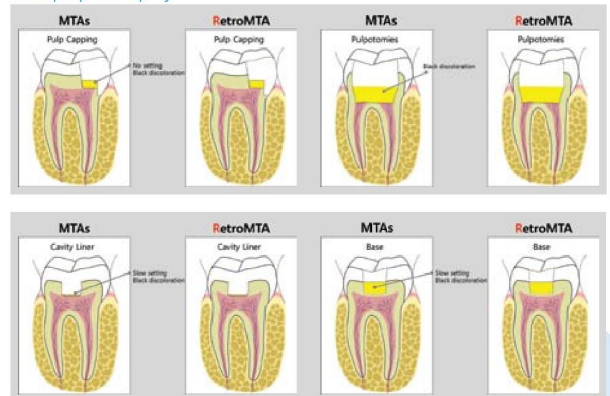
Root canal repair



Root replantation

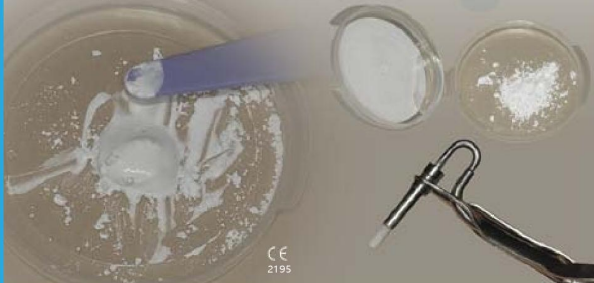


Vital pulp therapy



Mixing Instructions

1. Open the RetroMTA cap.
2. Cut off the end portion of powder pouch and plastic pipette with scissors.
3. Pour 0.3 g of powder and make 3 drops of liquid on the floor of the cap.
4. Wet it gently with a plastic spatula for 40 seconds. (DO NOT MIX)
5. Wait until the shiny surface disappears.
6. Load it on the carrier and apply it on the procedure area.
 - * If too watery, use dry cotton pellet on the procedure area with gentle pressure approximately 120 seconds.
 - * If too powdery, use wet cotton pellet on the procedure area with gentle pressure approximately 120 seconds.



RetroMTA®



1. Open the RetroMTA cap and cut off the pouch and pipette.



2. Make 3 drops of liquid and pour the 0.3 g powder into the floor of the cap.



3. Wet it gently for 40 seconds.



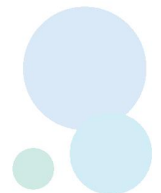
4. Wait until the shiny surface disappears.



5. Load it on the carrier and apply it on the procedure area.

PACKAGE

0.3g X 8 caps / package



Physical properties

Property	RetroMTA	ProRootMTA
Specific gravity	3.106	-
Surface Area (m ² /kg)	961	409
Average particle size (µm)	2.62	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	180 sec	74 min
Setting time, final	360 min	210 min

Property	RetroMTA	ProRootMTA
Particle size (µm) 1)	10.0	6.9
Content of free CaO wt.% 2)	0.66	1.74
Total crystalline phases (%) 3)	96.9	94.3
Expansion coefficient (%) 4)	0.09	0.27
Color	White	Yellow & Gray
Heavy metal	Non detected	Cr,As,Ni

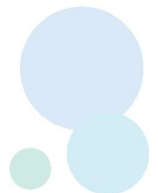
1. Mastertech (Malvern co., Ltd. Ver. 2.15)
2. KSL-5120
3. Calculated from composition measured by QX-RD (Phillips. PW1710)
4. Measured by Laser displacement sensor Micro Track 7000

Composition and Ingredient Information

Product	Chemical Name	CAS No.	Content (wt%)
RetroMTA (OrthoMTA II)	Calcium Carbonate (CaCO ₃)	471-34-1	60-80
	Silicon Dioxide (SiO ₂)	7631-86-9	5-15
	Aluminum oxide	1344-28-1	5-10
	Calcium zirconia complex	contrast media	20-30
	Total		100

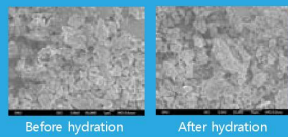
Characteristics of RetroMTA

- Rapid setting time : 150 sec
- Excellent sealing ability
- Excellent antibacterial effect
- No discoloration
- No heavy metals : No Cr, As, Ni, Bi, Fe, Cd
- Non toxic to cells : Grade 0 (cell toxicity test)
- Good radio-opacity : Al 5 mm above value

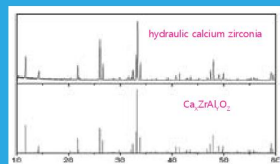


Hydraulic calcium zirconia

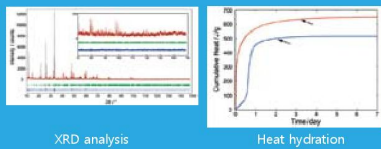
SEM



XRD analysis

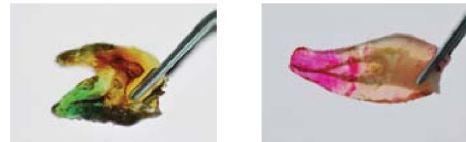


Heat hydration

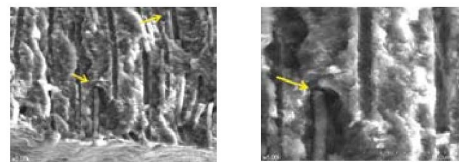


Sealability

Material & Methods : immersion 12 hr before chemical setting



Sealability : infiltration depth of C-S-H.
100 micron into the dentinal tubules.



Cell toxicity (ISO 10993-5)

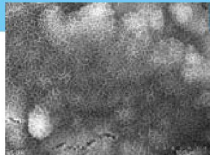
Material and methods

- RetroMTA-OrthoMTA II (Lot No. ReT02427-1)
- L-929
- RPMI 1640 (10% FBS + 1% Penicillin - streptomycin)
- 3% Agar
- CO2 Incubator in CO2
- Control 4
- Experimental 4

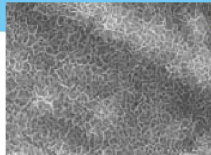
Result

- Grade 0
- No toxic to cell

CDHA formation in PBS after 2wks

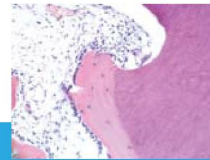
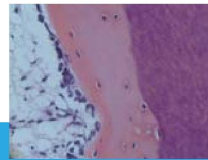


X5,000

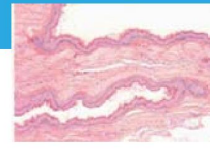


X10,000

Bioactivity : in vivo



Irritability to oral mucosa



Result : No irritability
(ISO 10993-10 Annex B Oral mucosa irritation test)

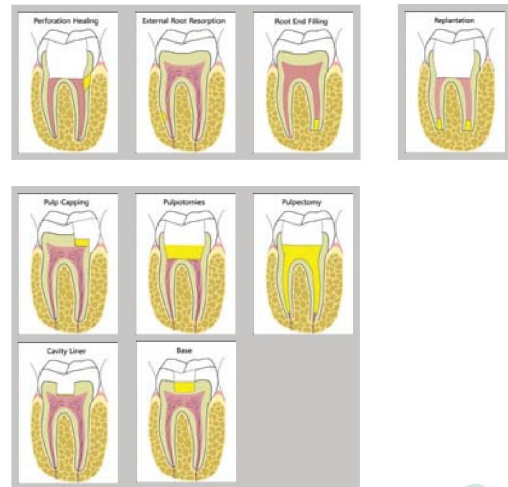


RetroMTA®



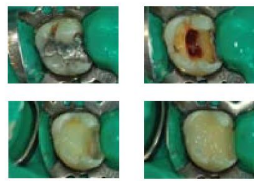
PACKAGE 0.3g X 8 caps / package

INDICATION

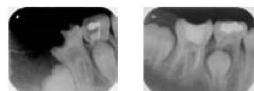


PEDIATRIC

Vital Pulpotomy

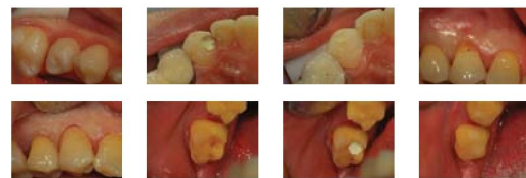


Apexogenesis

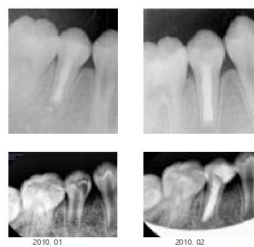


PEDIATRIC

Pulp Capping

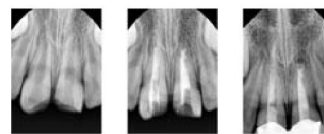


Apexification



2010_01

2010_02



crown fracture

RetrolMTA grafting

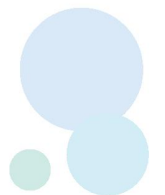
12ms F/U



2009_01



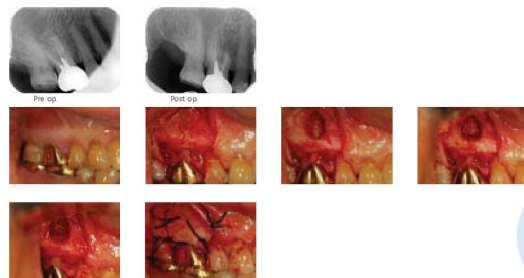
2009_07



Endodontic

Perforation

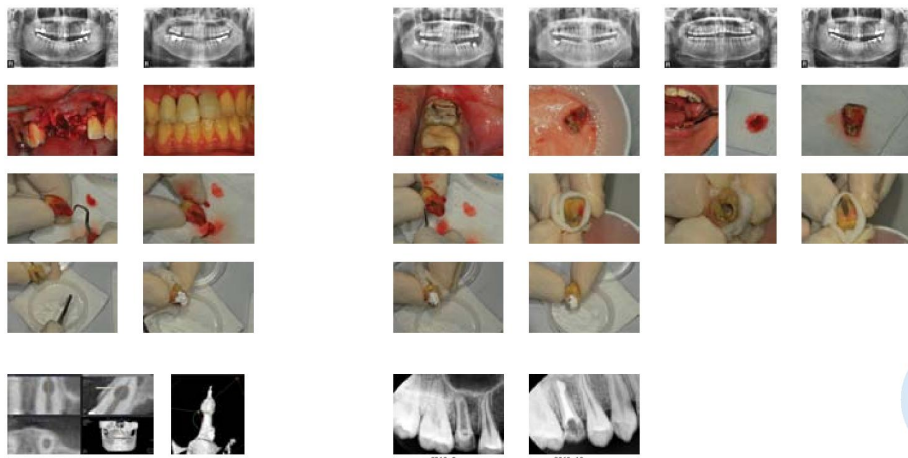
Apicoectomy



Endodontic

Replantation

Root Resorption



Esthetic

Treatment of discoloration

Prevention of discoloration

No Black of discoloration



Discoloration with other MTA



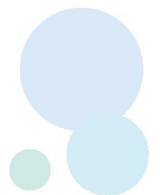
No discoloration with RetroMTA



OrthoMTA
Gutta-percha
Discoloration
with other MTA



OrthoMTA
Gutta-percha
No discoloration
with RetroMTA



RESEARCH & DEVELOPMENT

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