



RESEARCH & DEVELOPMENT

Seoul National University, Research Park Room #323
San 4-2 Bongchun dong, Gwanak-gu, Seoul 151-919, Korea
Tel : 82-2-885-3923 Fax : 82-2-887-3923 E-MAIL : biomta@biomta.com

COPYRIGHT©biomta.com. All RIGHT RESERVED.



RetroMTA®
Vital Pulp Therapy & Root Repair



Vital Pulp Therapy & Root Repair

RetroMTA®

RetroMTA is a hydraulic bioceramic material for repair and vital pulp therapy. portland cement is not used as a raw material. RetroMTA is a powder consisting of fine, hydrophilic particles that set in the presence of water and form a strong impermeable barrier. It contains hydraulic calcium zirconia complex as a contrast media. Setting time is 150 seconds. It has no discoloration even in the blood contamination. Therefore it is a ideal for aesthetic repair material. It contains no heavy metals. It has no toxicity to cells with in 48 hours. This means it is a ideal substance for vital pulp therapy. (pulp capping, pulpotomy and pulpectomy) In vivo condition, initial Ph is up to 12.5 and down to 7.8~8.0 in 4 weeks. Ex vivo study shows it has the high potential for biomineralization.



Fast Setting	No Discoloration	No Heavy Metal
No Cell Toxicity	Good Handling Properties	Economic Price



Mixing Instructions

1. Open the cap and pouch.
2. Pour the 0.3g powder into the floor of the cap
3. Cut the plastic pipettes with scissors
4. Make 3 drops onto the powder
5. Wet it gently with a plastic spatula for 20 seconds
6. Wait until the shiny surface disappears
7. Apply the putty like RetroMTA with proper pressure



RetroMTA®



1. 0.3g RetroMTA powder and wetting solution



2. Pour the 0.3g powder make 3 drops



3. Wet it gently within 20 seconds



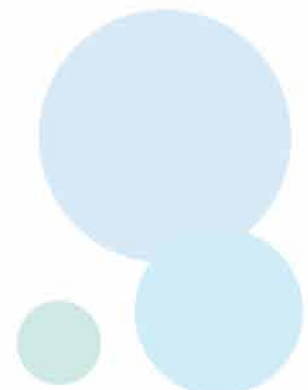
4. Wait until the shiny surface disappears



5. Apply it with a carrier

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)	2.0	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	2.78
Color	White	Yellow & Gray
Heavy metal	Non detected	Cr6+

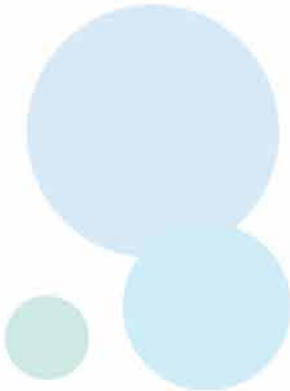
1) Mastersizer (Malvern co., ltd. Ver. 2.15)
2) KSL 5120
3) Calculated from composition measured by QX-RD (Phillips, PW1710)
4) Measured by Laser displacement sensor Micro Track 7000

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

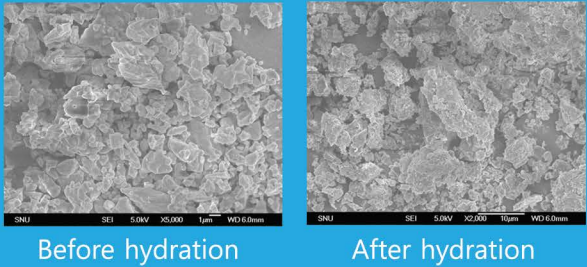
- Rapid setting time : 150 sec
- Excellent sealing ability
- Excellent bactericidal effect
- No discoloration
- No heavy metal : No Cr, As, Ni, Bi, Fe, Cd
- No toxic to cells : Grade 0 (cell toxicity test)
- Good radio-opacity : Al 5 mm above value



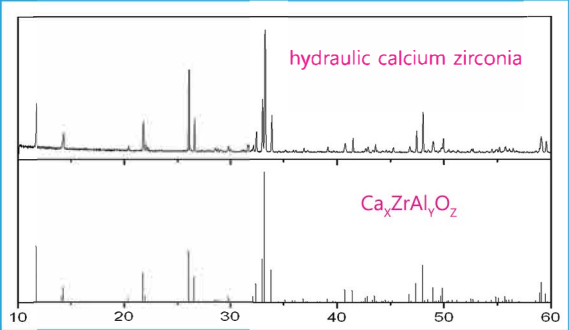


Hydraulic calcium zirconia

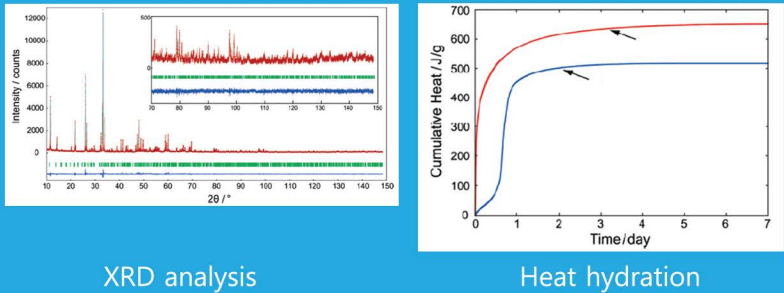
SEM



XRD analysis



Heat hydration



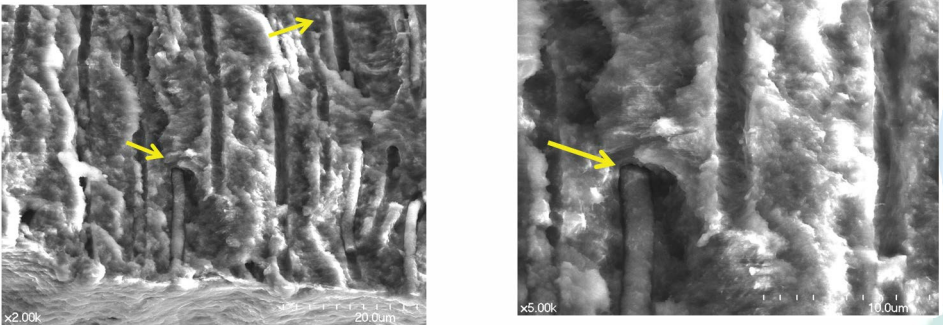
Sealability

Material & Methods : immersion 12 hr before chemical setting



Result : No leakage

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



X2000

X5000



Cell toxicity (ISO 10993-5)

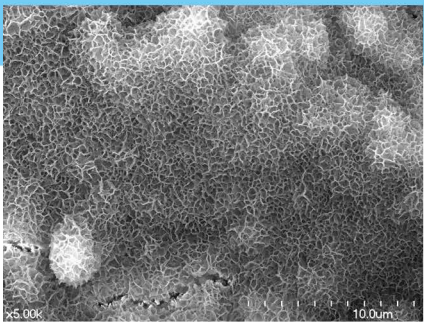
Material and methods

- 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

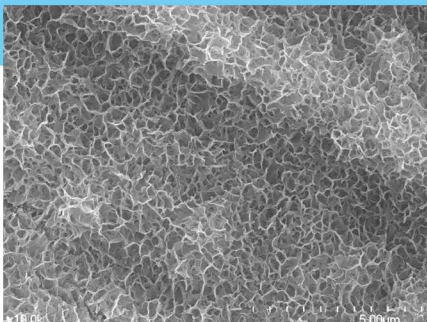
Result

- Grade 0
- No toxic to cell

CDHA formation in PBS after 2wks

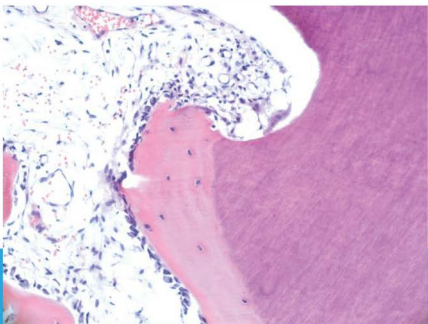
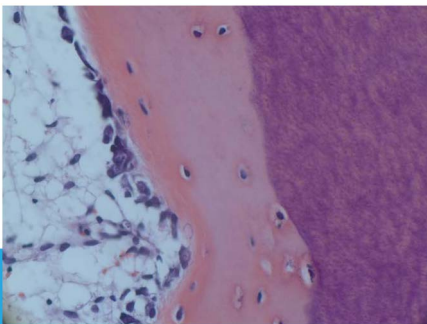


X5,000

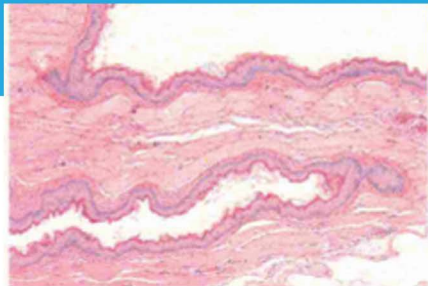


X10,000

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

Pulp capping • Pulpotomy • Pulpectomy • Apexification • Apexogenesis • REP

Endodontic

Perforation • Apical surgery • Root resorption • Replantation • 1-visit Apexification • Indirect pulp capping

Esthetic

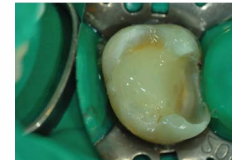
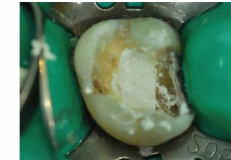
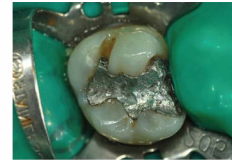
Treatment of discoloration • Prevention of discoloration • No Black of discoloration



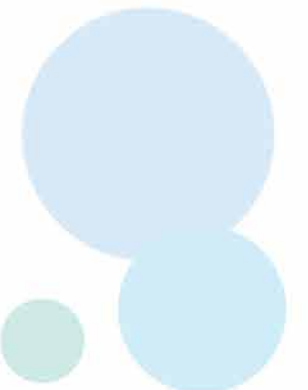
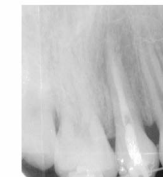
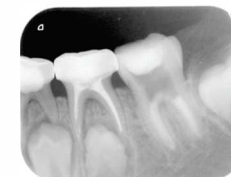
PEDIATRIC



Vital Pulpotomy



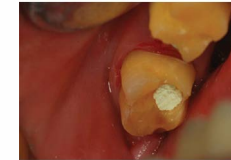
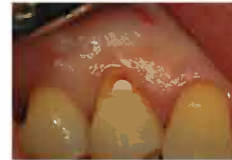
Apexogenesis



PEDIATRIC



Pulp Capping



Apexification

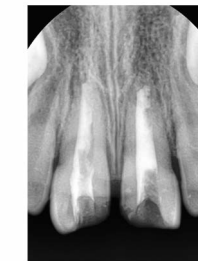


2010. 01

2010. 02



crown fracture



RetroMTA grafting



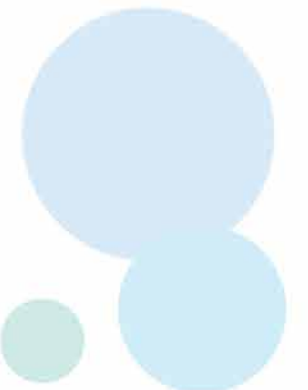
12ms F/U



2009. 01



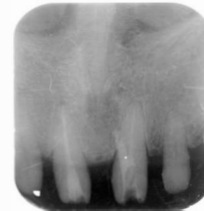
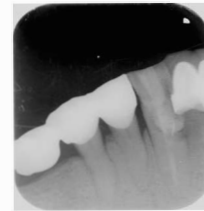
2009. 07



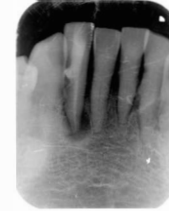
Endodontic



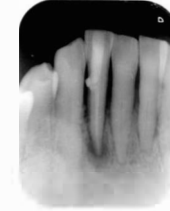
Perforation



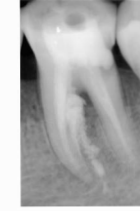
2009. 4. 27



2009. 6. 5



2009. 12. 21



26y, female, #46
2010. 10. 28 CF
2010. 11. 11 CR SET



50y, male, #36
2010. 10. 27 CF
2010. 11. 8 CR SET



25y, male, #36
2010. 2. 17 CF
2010. 3. 26 CR SET

Apicoectomy



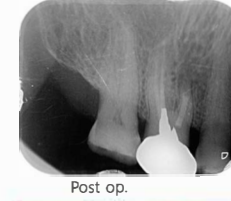
Pre op.



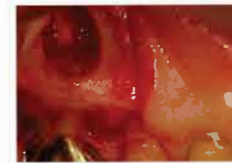
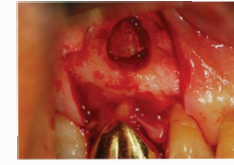
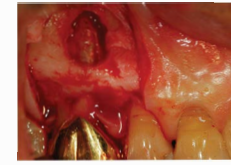
Post op.



Pre op.



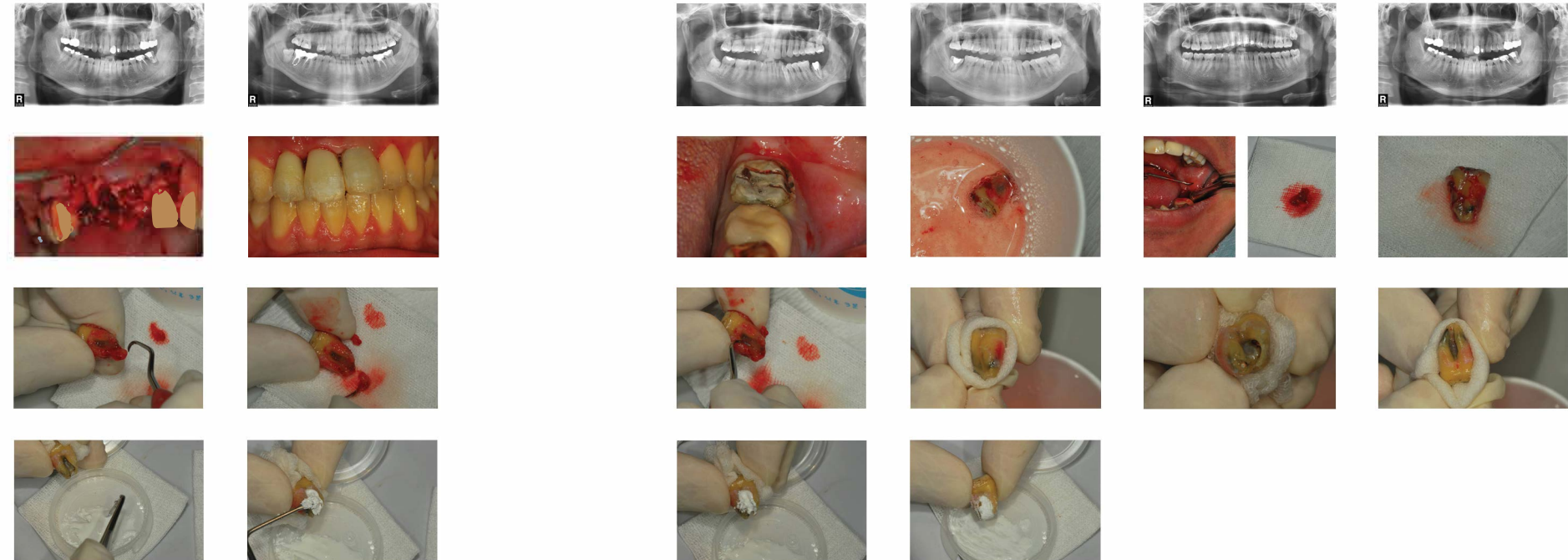
Post op.



Endodontic



Replantation



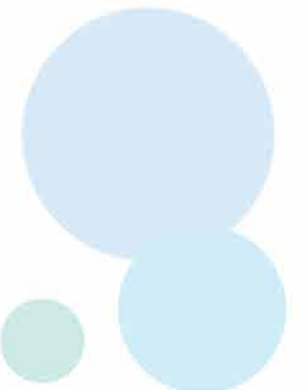
Root Resorption



2010. 9.



2010. 10.



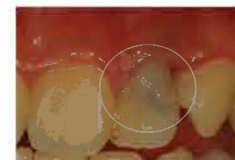
Esthetic



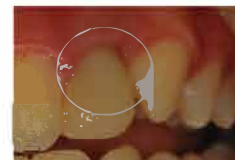
Treatment of
discoloration

Prevention of
discoloration

No Black of
discoloration



기존 MTA시 흑변



RetroMTA시 흰색유지



OrthoMTA
Guttapercha
기존 MTA흑변



OrthoMTA
Guttapercha
RetroMTA 백색

