

BioactiveGlass

NISHIKA CANAL SEALER<sup>®</sup> BGmulti

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## Frequently Asked Questions & Clinical Cases

## Q01 What is NISHIKA CANAL SEALER BG multi?

A bioceramic material containing Bioactive Glass can be easily changed to your desired consistency by the addition of powder to the paste. It is a versatile material that can be used widely for the root canal filling, pulp capping, perforation repair, and root-end filling.

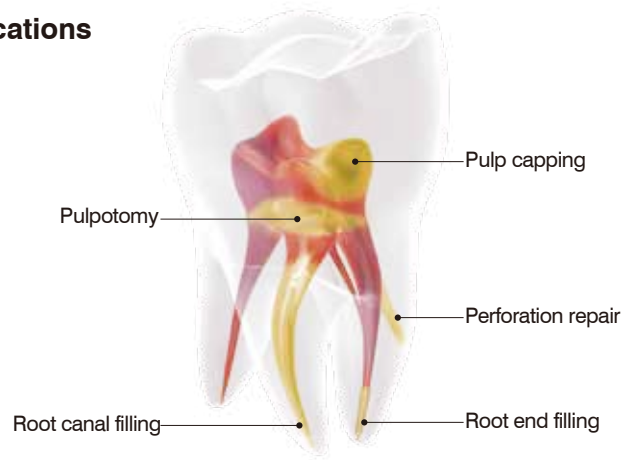
Paste 3g




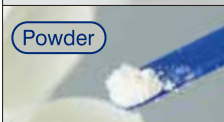
Powder 2g



### ● Indications



## Q02 What is the composition of NISHIKA CANAL SEALER BG multi?

	Paste A	Bismuth subcarbonate, Fatty acid, Silicon dioxide
	Paste B	Calcium silicate glass (a type of Bioactive Glass), Magnesium oxide, Purified water, Silicon dioxide, etc.
	Calcium silicate glass (a type of Bioactive Glass), Calcium hydroxide.	

### Q03 What is the setting mechanism?

The paste is cured by the reaction of fatty acids and magnesium oxide. When powder is added, it is cured by the reaction of fatty acid, magnesium oxide, and calcium hydroxide.

### Q04 What is different from MTA?

MTA used in the field of endodontic treatment is commonly used for the pulp capping, perforation repair, root-end filling, etc. Nishika Canal Sealer BG multi has the same intended use.

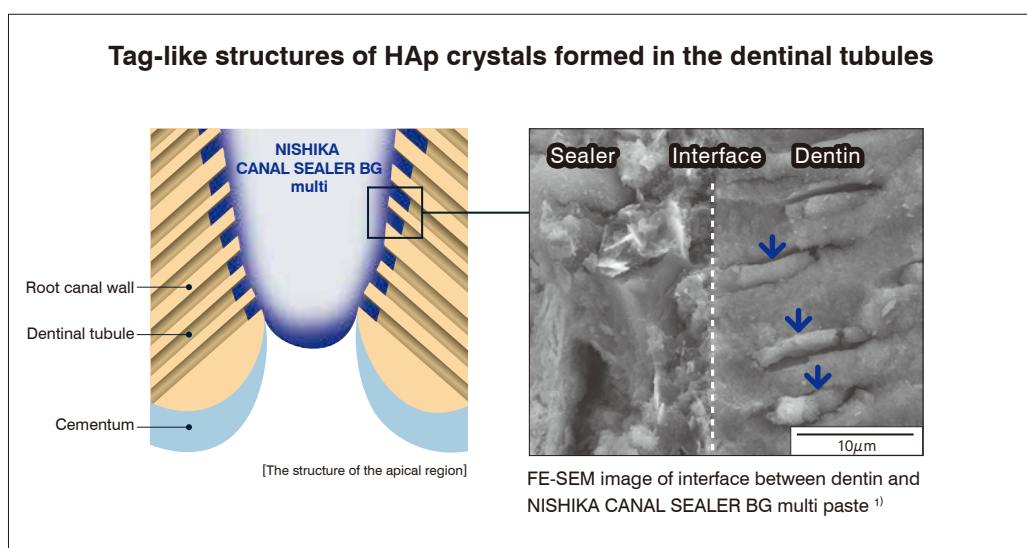
On the other hand, the setting reaction of the materials is different. MTA is cured by a hydration reaction with the material and water.

Nishika Canal Sealer BG multi is cured by acid-base reaction with fatty acid, magnesium oxide, and calcium hydroxide and has advantages such as ease of mixing, constant consistency, predictable setting time, and washout resistance.

### Q05 How is sealing ability?

It has an excellent sealing ability.

When this material is applied to tissue fluid, apatite is formed from the surface, and apatite tags are formed in the dentinal tubules to strongly integrate with dentin, which results in a high sealing ability.<sup>1)</sup>

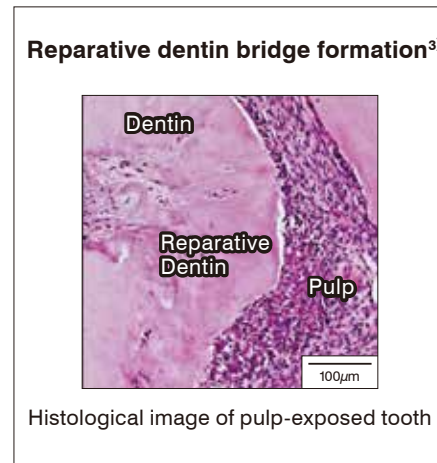
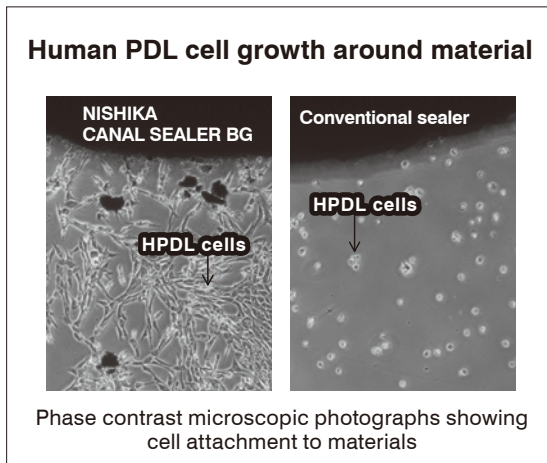
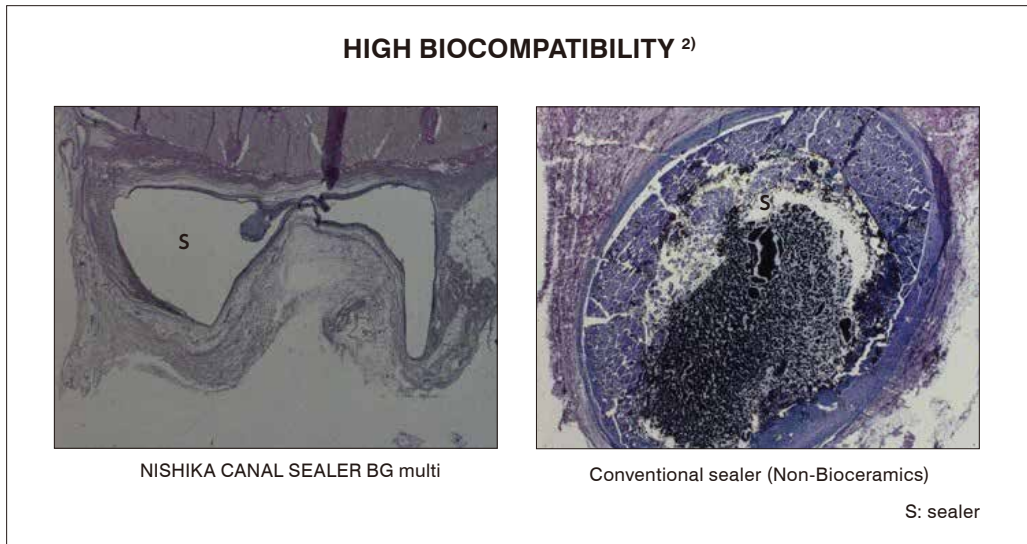


## Q06 How is biocompatibility?

It has high biocompatibility.

It has been shown that human periodontal ligament cells grow in the vicinity of this material and that inflammation is smaller compared to conventional sealers (both eugenol and non-eugenol) in subcutaneous implantation on the back of rats.<sup>2)</sup>

In addition, it has been shown that when used as a pulp capping material, reparative dentin bridge has been formed in a rat pulp capping model.<sup>3)</sup>



Source: Division of Endodontics and Restorative Dentistry, Kyushu Dental University

## Q07 What is the setting time of paste ?





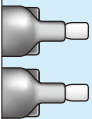
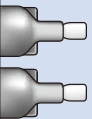
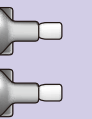
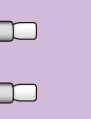



Intra oral setting time: approx. 60 min.

(Time required for gutta-percha points to harden and not to come off)

Final setting time: approx. 180 min.

**Q08** How does the mixing ratio of the paste and powder change the characteristics of the mixture?

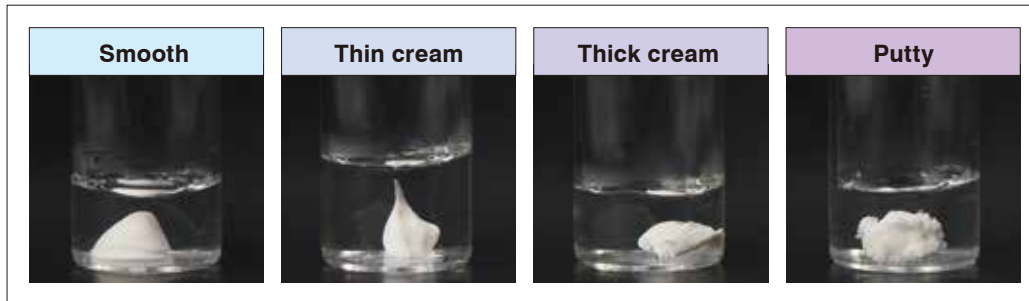
With the mixing of the powder with the paste, this material can adjust the consistency according to the intended use and can be applied widely for the pulp capping, perforation repair, and root-end filling.

	Smooth	Thin cream	Thick cream	Putty
Consistency				
	No powder	Less powder	More powder	
Mixing ratio Paste : Powder	10 : 0	10 : 2	10 : 4	10 : 6
pH	9.5 ~ 10.2	10.2 ~ 10.9	10.3 ~ 11.1	10.6 ~ 11.3
Final setting time	180min.	135min.	90min.	60min.
Radiopacity	6mmAl	5mmAl	5mmAl	4mmAl
Indicator of mixing ratio	 Paste only No powder added	 +	 +	 +
		 half a spoonful	 a spoonful	 2 spoonfuls

## Q09 Is it resistant to washout?

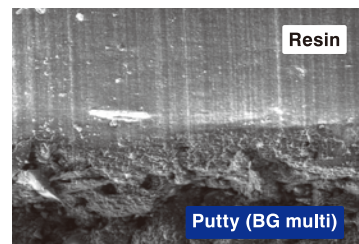
It exhibits excellent washout resistance in any consistency.

Even when exposed to water immediately after mixing, the shape does not break.<sup>4)</sup>



## Q10 How long will liner or restorative material wait to be placed on NISHIKA CANAL SEALER BG multi?

If it can be pressed for the filling in a putty consistency, you can proceed to the next step without waiting for curing due to an excellent washout resistance.



SEM image of interface between a conventional resin material and NISHIKA CANAL SEALER BG multi (putty).

## Q11 How economical is it?

It is economical, because of less material waste.

**Paste** ..... Over 50 root canals per 3g-syringe

**Powder** ... Creamy consistency approx.100 applications per 2g-jar  
Putty consistency approx.50 applications per 2g-jar

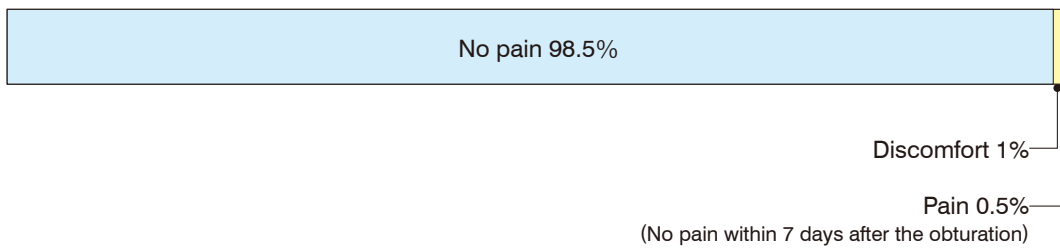
## Q12 What technique can be used for root canal filling?

- Single cone
- Multi-cone technique
- Lateral condensation
- Vertical condensation
- Sealer only, etc.

**Q13 Are there any clinical results with NISHIKA CANAL SEALER BG multi as a root canal sealer?**

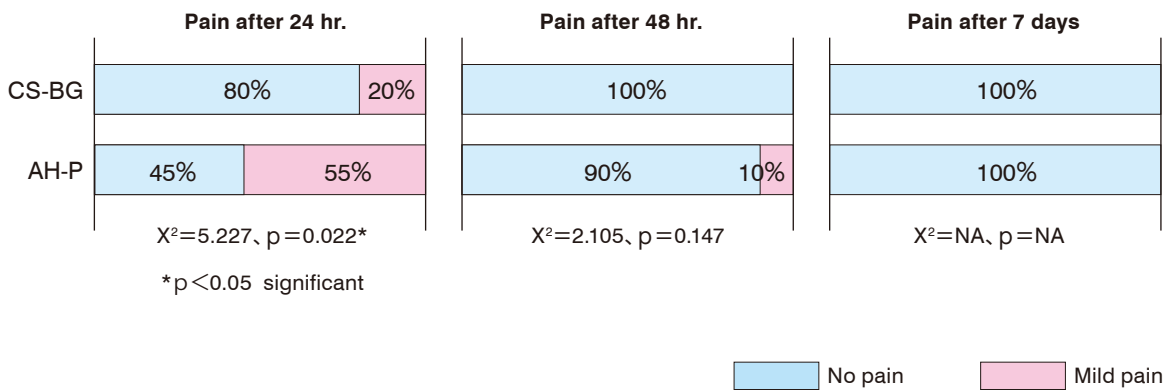
**1) Postoperative Pain <sup>5)</sup>**

- Study design: prospective cohort study
- Material: NISHIKA CANAL SEALER BG multi paste
- Number of cases: 555 cases (November 2017 – November 2019)
- Root canal obturation techniques: Single-cone technique (24%)  
Multi-cone technique without condensation (55%)  
Lateral condensation technique (20%)  
Vertical condensation technique (1%)



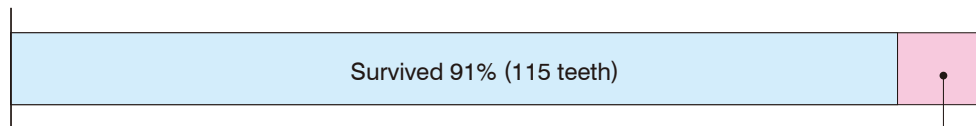
**2) Postoperative Pain <sup>6)</sup>**

- Study design: randomized controlled trial
- Material: NISHIKA CANAL SEALER BG multi paste (CS-BG), Epoxy resin-based root canal sealer (AH-P)
- Number of cases: 40 cases (20 cases each)
- Postendodontic pain following root canal therapy



### 3) 3-year Retrospective Follow-up <sup>7)</sup>

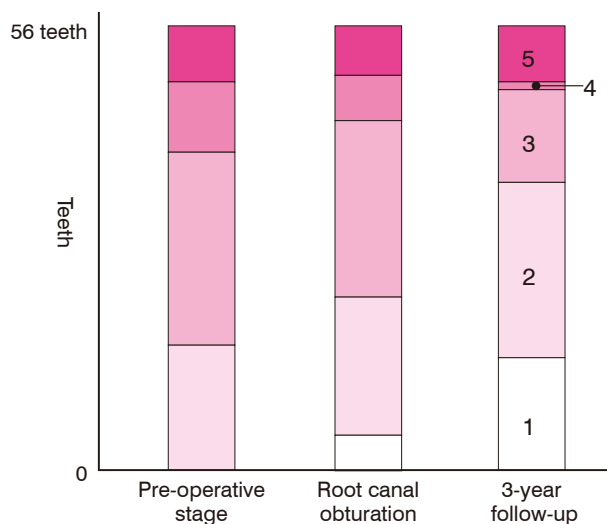
- Study design: Retrospective study
- Material: NISHIKA CANAL SEALER BG multi paste
- Number of cases: 127 cases
- Root canal obturation techniques: Single-cone technique (30%)  
Multi-cone technique without condensation (65%)  
Lateral condensation technique (5%)



Extracted 9% (12 teeth)

The 12 extracted teeth were initially diagnosed as non-preservable by the dentist because of root cracks or fractures and extensive bone defects, but were endodontically treated in accordance with the patients' strong requests.

#### Periapical index score (56 surviving teeth)



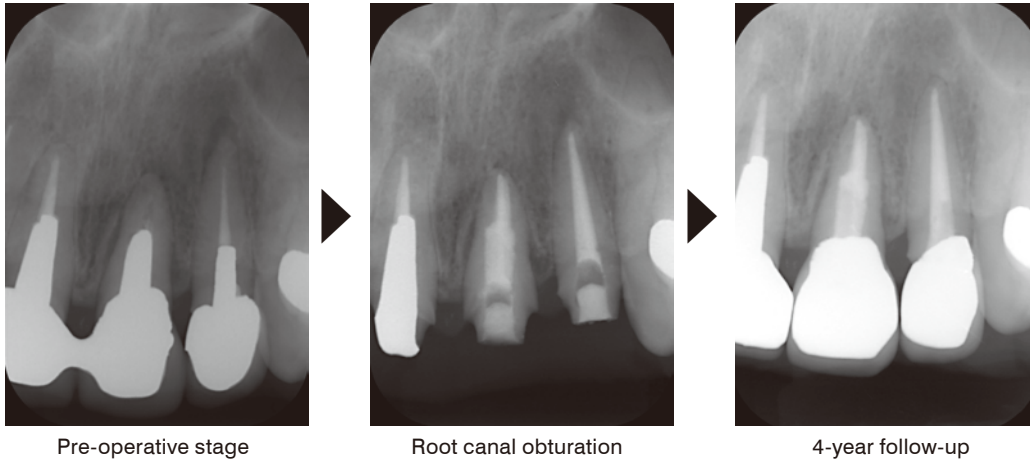
- Score 1: Normal periapical structure
- Score 2: Bone structural changes indicating, but not pathognomonic for, apical periodontitis
- Score 3: Bone structural changes with some mineral loss characteristic of apical periodontitis
- Score 4: Well-defined apical radiolucency
- Score 5: Radiolucency with radiating expansion of bone structural changes

The rates of scores 1 and 2 increased, whereas those of scores 3 and 4 decreased. Herein, a bioceramics-based sealer, can be applied to achieve favorable outcomes in endodontic therapy.



## Clinical case 1 Root Canal Filling<sup>8)</sup>

- A female at the age of 55
- Refractory apical periodontitis in the left maxillary anterior teeth region. After the symptoms subsided by the infected root canal treatment, a root canal filling was performed, using single cone technique. There was no change in the tight root canal filling after 4 years, and the apical periodontal tissues remained normal after the apical lesion .



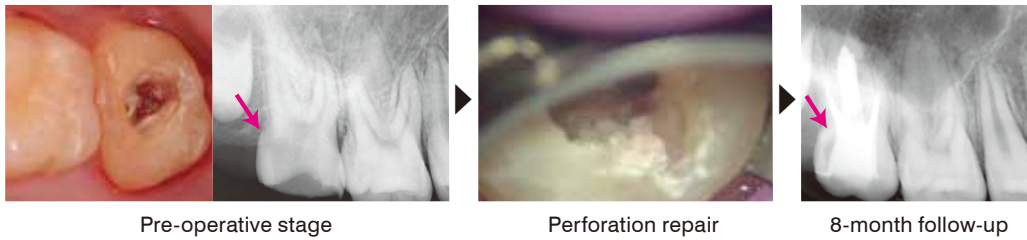
## Clinical case 2 Pulp Capping<sup>8)</sup>

- A female at the age of 72
- After the removal of the infected dentin from caries (Figure a), a thin layer of a sealer-like mixture was initially applied to the dentin surface, and a whipped mixture was filled on it (Figure b). Then, the excess mixture was removed, and composite resin was used for the repair (Figure c). Although the wettability to dentin is lower in the whipped mixture which has moldability by added powder than in sealer-type mixture, the handleability during the pulp capping is improved by the method shown in this case.



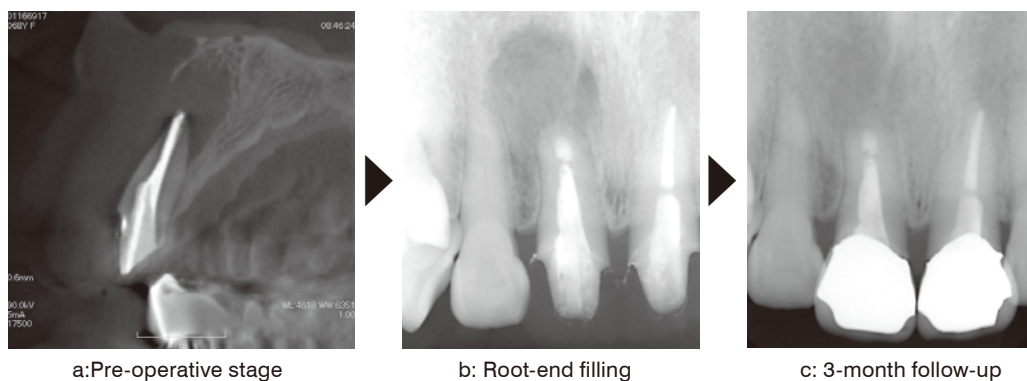
### Clinical case 3 Perforation Repair<sup>8)</sup>

- A male at the age of 12
- Perforation observed in the distal tooth cervix was sealed with sealer-like and whipped mixtures, and the whole area was covered with adhesive resin to complete the procedure. At eight months after the perforation repair, the sealing condition was unchanged with no pain or signs of inflammation observed, and normal conditions were maintained.



### Clinical case 4 Root-end Filling<sup>8)</sup>

- A female at the age of 69
- In the case of radicular cyst treatment (Figure a), the cystectomy and apicoectomy were performed, and then the root-end filling was performed (Figure b). After a cavity at the root apex was prepared with an ultrasonic retro-tip, the cavity was filled with a whipped mixture, and the procedure was completed by pressing the cavity with a cotton ball containing saline. At three months after the root-end filling, there was no recurrence of pain or fistula, and the reduction of the radiolucency (increased radiopacity) in the root apex was confirmed (Figure c).



◎ **Reference**

- 1)Yoshii *et. al.*, JpnConserv Dent, 59(6): 463-471, 2016.
- 2)Kato *et. al.*, JpnConserv Dent, 65(2): 145-153, 2022.
- 3)Hanada *et. al.*, J Biomed Mater Res B Appl Biomater, 107(B), 161-168, 2019.
- 4)Ishikawa, DENTAL DIAMOND 誌上デンタルショー 使ってみたい歯科のベストアイテム 2022, 77-80, 2022.
- 5)Washio *et. al.*, IJERPH, 17(23): 8857, 2020.
- 6)Supreet, *et. al.*, JConserv Dent, 26(2):194-198, 2023.
- 7)Washio *et. al.*, ODEP. 2(1): 16-24, 2022.
- 8)Kitamura, *et. al.*, DENTAL DIAMOND 歯内療法の種類の新神器 2023-2024;142-145, 2022.

**For Further Information**



<https://www.nishika.co.jp/english/bgm/>