Endodontics

Biodentine®
Dentin Substitute
Biodentine®: Save the root, Save the tooth

Bioactivity triggers regeneration

1. High biocompatibility with all dental tissues
2. Biodentine® increases the mineral density of dentin through calcium ion release
3. Biodentine promotes cell proliferation and supports periradicular healing

Outstanding seal with secure placement

2. Crystallization inside the dentin tubules allows a tight interface with dentin and ensures strong resistance to leakage
3. Biodentine sets in moisture in only a few minutes allowing fast repair procedures
4. Biodentine shows high wash-out resistance and high push-out bond strength avoiding material dislodgement during the restorative procedure (1,2)
When it comes to special endodontic treatments, predictability can sometimes be difficult. Biodentine® enhances your success rates due to innovative and bio-oriented properties.

**Technical Insights**

**Proven biocompatibility and bioactivity for endodontic repairs**
- High biocompatibility assessed and evidenced through many scientific publications
- High release of calcium ions to increase the mineral density of root canal dentin
- Shows both osteogenic and angiogenic properties to promote soft and hard tissue healing
- High purity tricalcium silicate with no aluminum inclusions or trace metals

**Tight seal supporting root longevity after root repair**
- Mineral tag formation in the dentin tubules ensures strong micromechanical retention and a tight consistent seal
- High resistance to leakage supporting clinical success for endodontic repair procedures
- High pH (≈12) inducing antimicrobial properties reducing the risk of reinfection

**Product properties adapted for a moist environment**
- Physical properties are not affected by contact with tissue fluids and blood due to Biodentine’s hydraulic nature
- Biodentine doesn’t wash out and stays in place
- High push-out bond strength, unaffected by the use of endodontic irrigation solutions

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**Biodentine**

**Dentin**

Biodentine cement labelled with fluorescein dye which has moved from the cement into the dentin tubules. Notice the plugs of material in the tubule openings.

**Mineral tags inside dentin tubules.**

_Biodentine™_ MTA

**Phosphate-buffered saline immersion**

<table>
<thead>
<tr>
<th>Time</th>
<th>Ca</th>
<th>Si</th>
</tr>
</thead>
<tbody>
<tr>
<td>24h</td>
<td>66.8 (5.1) a</td>
<td>14.4 (3.8) b</td>
</tr>
<tr>
<td>7 days</td>
<td>116.8 (10.1) a</td>
<td>77.8 (13.5) b</td>
</tr>
<tr>
<td>30 days</td>
<td>212.2 (26.4) a</td>
<td>166.8 (10.1) b</td>
</tr>
<tr>
<td>90 days</td>
<td>296.0 (26.0) a</td>
<td>206.6 (15.1) b</td>
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Mean (SD), n=5
Mean values followed by different letters in the same line of the same element are significantly different (P<0.05)
MTA, mineral trioxide aggregate

Source: Han, Okiji, IEJ, 2011

**Biodentine shows higher resistance to dislodgement, regardless of the irrigation solution**

Push-out bond strength (MPa)

Source: Guneser et al., JOE, 2013
Clinical cases

Perforation

Perforations of the root canal and of the pulp chamber floor usually are the most difficult accidents to solve and with uncertain prognosis. Biodentine has high sealing properties and is easy to place particularly in areas difficult to access. The setting time is a major advantage as work can be continued in the same operating session.

Apical surgery

For successful apicoectomy, retrograde sealing of resected root canals is essential because gutta-percha alone is known not to be capable of inducing osseous regeneration at the root tip. Biodentine shows a positive effect on osseous cells and allowed, in this case, complete osseous regeneration 6 months after treatment. [3]

Resorption

Cervical root resorption mostly occurs directly beneath the epithelial attachment and is caused ultimately by an injury to the periodontium.

Biodentine is easy to place, sets fast, shows a tight seal and causes no tooth discoloration. [4]

Biodentine can effectively treat root resorptions.
After removal of the coronal restorative material, an amalgam is noticed on the pulp chamber floor. Biodentine is prepared and the cavity is filled layer by layer without pressure. 1-year follow-up.

Amalgam is removed. Granulation tissue is exposed with bleeding and pain on pressure.

1-year follow-up.

The radiograph obtained immediately postoperatively shows an osseous defect about the mesiobuccal root tip. The fractured root canal instrument was completely removed. Even 3 1/4 years after the procedure, apical stability was found.

Apicoectomy was performed in order to remove granulation tissue and the fractured instrument.

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The arrow indicates the exposed fractured root canal instrument at the mesiobuccal root.

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Condition after excocchleation of the granulation tissue.

Closure of the cavity with Biodentine.

Clinical picture after 12 months.

X-ray findings 1 year post-op.

Closure of the cavity with Biodentine.

Clinical picture after 12 months.

X-ray findings 1 year post-op.
Available in:
- Box of 15 capsules and 15 single-dose pipettes
- Box of 5 capsules and 5 single-dose pipettes