

Retention of provisional crowns cemented with three temporary cements



UAB School of Dentistry

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John Burgess, D.D.S., M.S.

Assistant Dean for Clinical Research
University of Alabama in Birmingham
SDB 536, 1530 3rd Ave S
Birmingham, AL 35294-0007
Telephone 205-996-5795 FAX 205-975-4747
JBurgess@UAB.edu

Deniz Cakir, D.D.S., M.S.

Instructor
University of Alabama in Birmingham
SDB 609B, 1530 3rd Ave S
Birmingham, AL 35294-0007
Telephone 205-996-6152 FAX 205-975-4747
deniz@uab.edu

Purpose

To measure provisional crown retention cemented with three cements.

Experimental Design

Cementation Techniques:

Group 1 –Temposil 2 (experimental, Coltene/Whaledent)

Group 2 – Temposil (Coltene/Whaledent)
Group 3 –TempBond NE (Kerr)

Replications: 10

Materials and Methods

Thirty freshly extracted teeth were selected for this study. The teeth were divided into three groups of ten teeth and the roots were notched to provide retentive areas and the teeth were placed into split PVC tubing filled with acrylic resin (Fig 1). After the resin polymerized, the occlusal surfaces were ground flat and placed into a lathe for precise uniform reduction with diamond cutting tools to produce a uniform crown preparation with exact taper, diameter and fit (Fig 2). An orientation groove was placed into the occlusal surface of preparation by hand using a 69 L bur (Brasseler, Georgia) and high-speed handpiece NSK, Brasseler, GA).

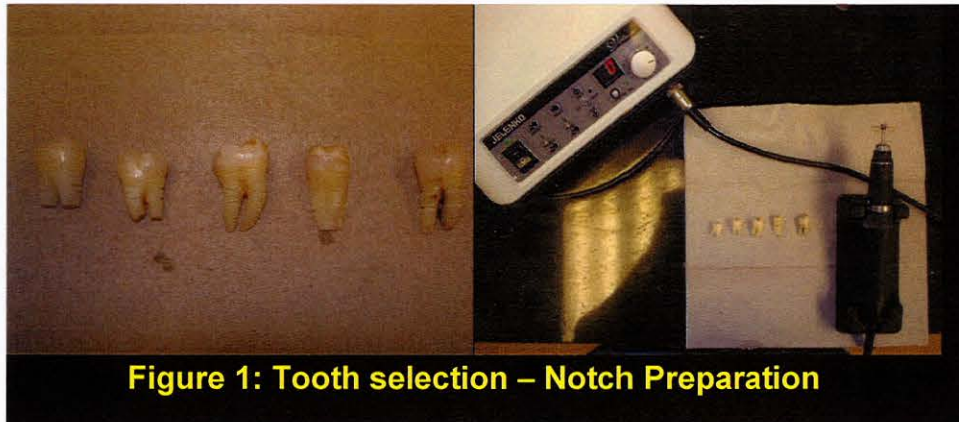
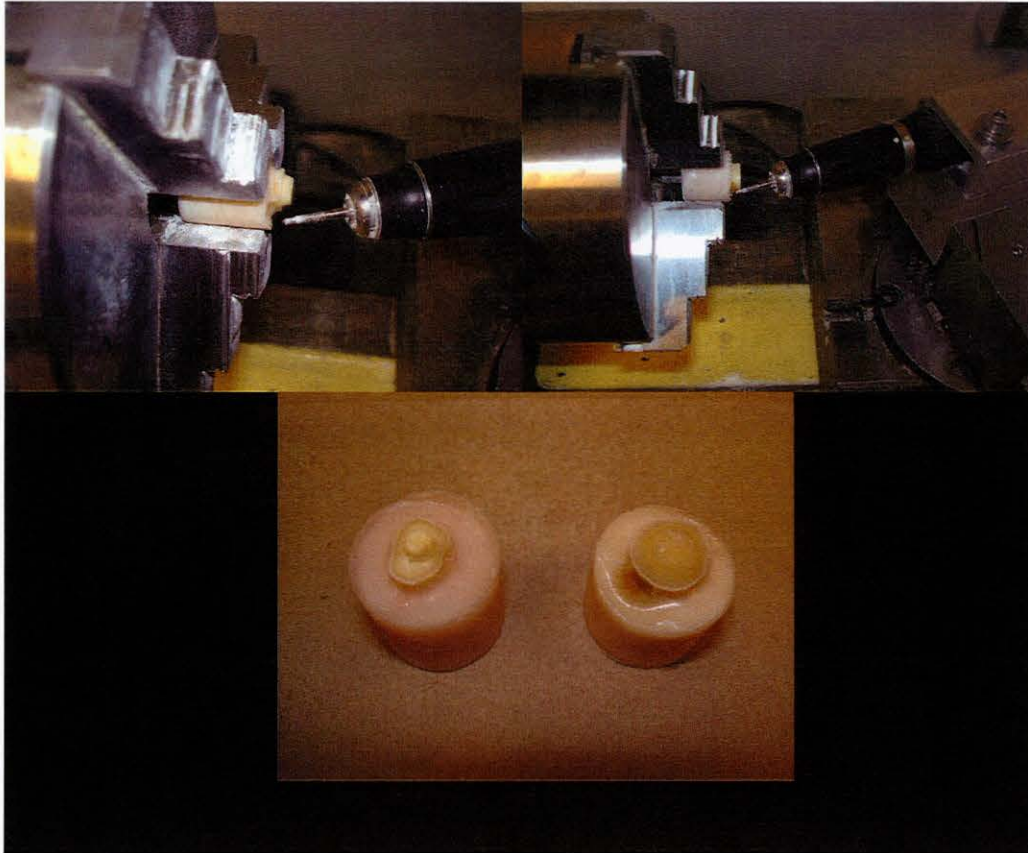




Figure 2: Preparing mounted tooth in lathe



After the teeth were prepared to uniform dimensions, Protemp was used to make provisional crowns for the preparations with a hole placed in the occlusal area. After the provisional restorations polymerized, the finished crowns were individually fit on the tooth, the margins checked for opening and fit (explorer does not catch) and the crowns cemented with one of the three provisional cements for each group of ten teeth. The cements were mixed following the manufacturers directions and a 2kg weight was placed on the cemented crown until the cement had set.



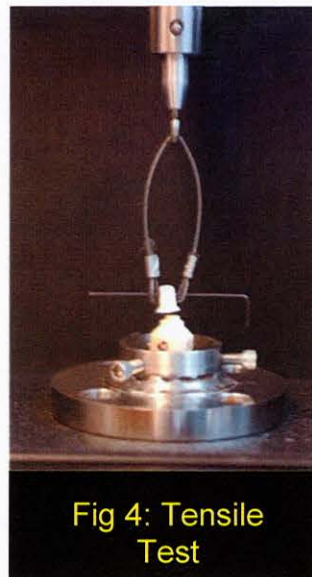
Fig 3: Cemented crown

Specimens of Group 1 were cemented with Temposil (experimental, Coltene/Whaledent) according to manufacturer's directions.

Specimens of Group 2 were cemented with Temposil (Coltene/Whaledent) following the manufacturer's directions.

Specimens of Group 3 were cemented with TempBond NE (Kerr) according to manufacturer's directions.

Excess cement was carefully removed and the crowns were placed in an incubator set at 98⁰F in tap water for 24 hours before debonding. A metal rod was placed through the hole on the crown and through the loops of a wire. Specimens were attached to the hook of the testing machine using the wire (INSTRON Model no: 5565) and loaded in tension at a cross-head speed of 0.5 mm/min until debonding occurred. The force (N) of debonding was recorded. Examination of the failure site was made optically with loops and recorded as cohesive, mixed or adhesive.



Results

Materials		Failure Load (N) (\pm SD)
Temposil Experimental	Lot: 0119097 Exp Date: 2007-10	13.5 (\pm 6)
Temposil	Lot: 0123210 Exp Date: 2009-04	18.7 (\pm 10)
TempBond NE	Lot: 6-1024 Exp Date: 2008-03	6.8 (\pm 5)

The results were analyzed with ANOVA and Tukey B post hoc test. Three significantly different groups were present and all cements produced significantly different retention values. The experimental material was intermediate and TempBond produced the lowest tensile strengths.

Remarks the commercially available Temposil produced the highest strengths. Upon closer examination it was noted that the experimental Temposil material did not adequately mix and the cement often did not polymerize.

The Experimental Temposil was not an improvement over the commercially available material, in either ease of mixing or in the retention it produced. That said both Temposil materials outperformed Temp Bond NE which is a provisional cement with a long clinical history of success.