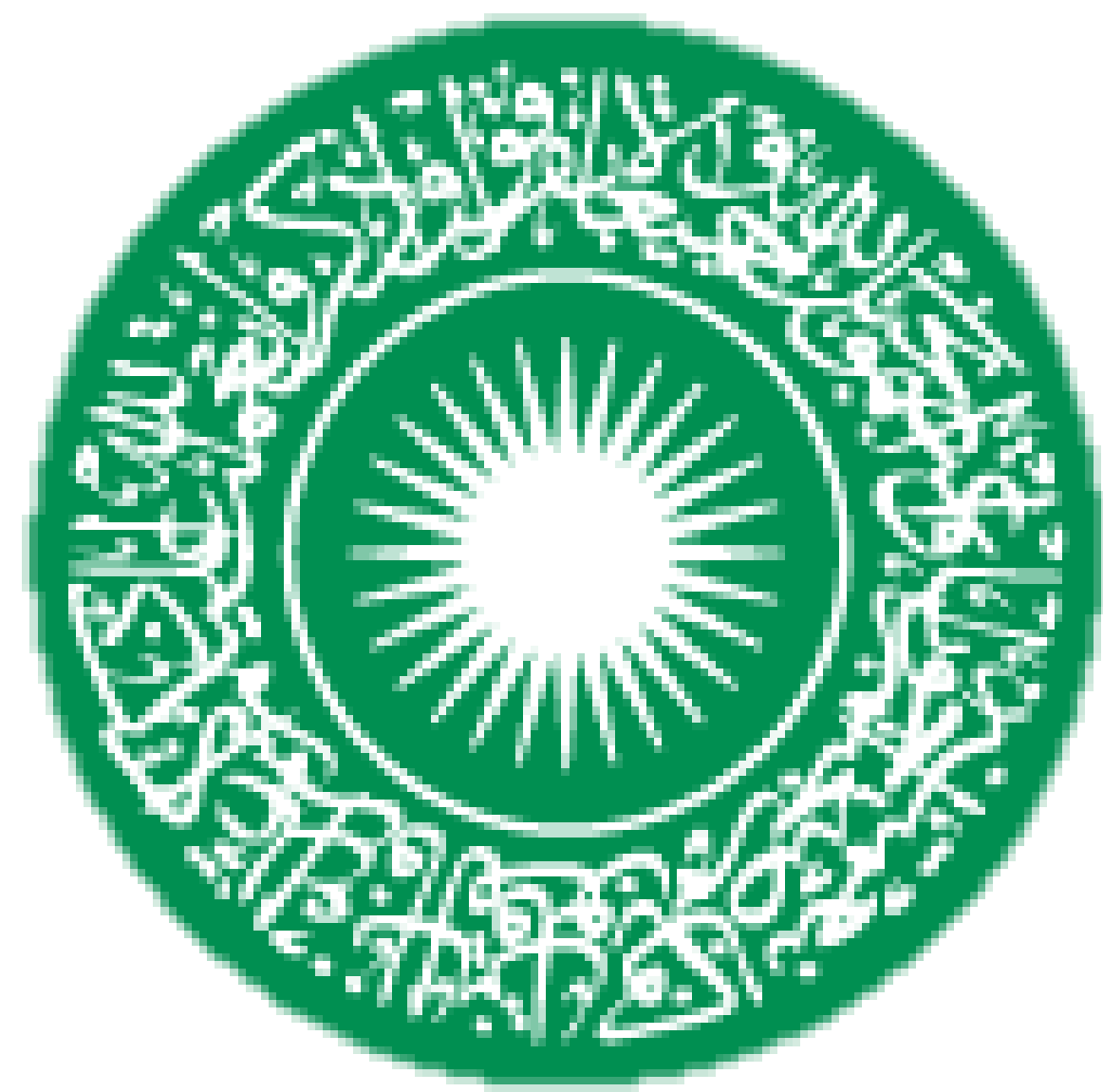


Comparison of marginal accuracy in two different materials used in provisional crown and bridge – an in vitro experimental study

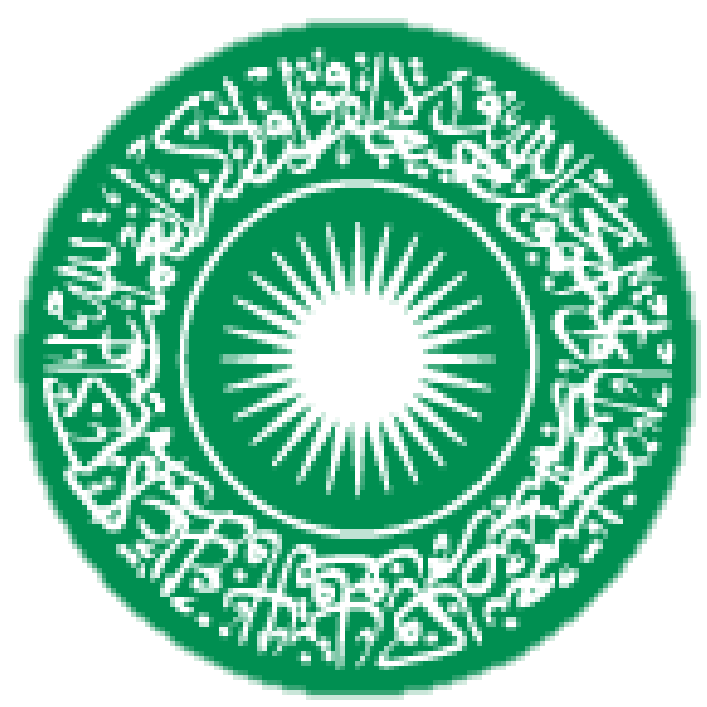


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Comparison of marginal accuracy in two different materials used in provisional crown and bridge – an in vitro experimental study

Objective

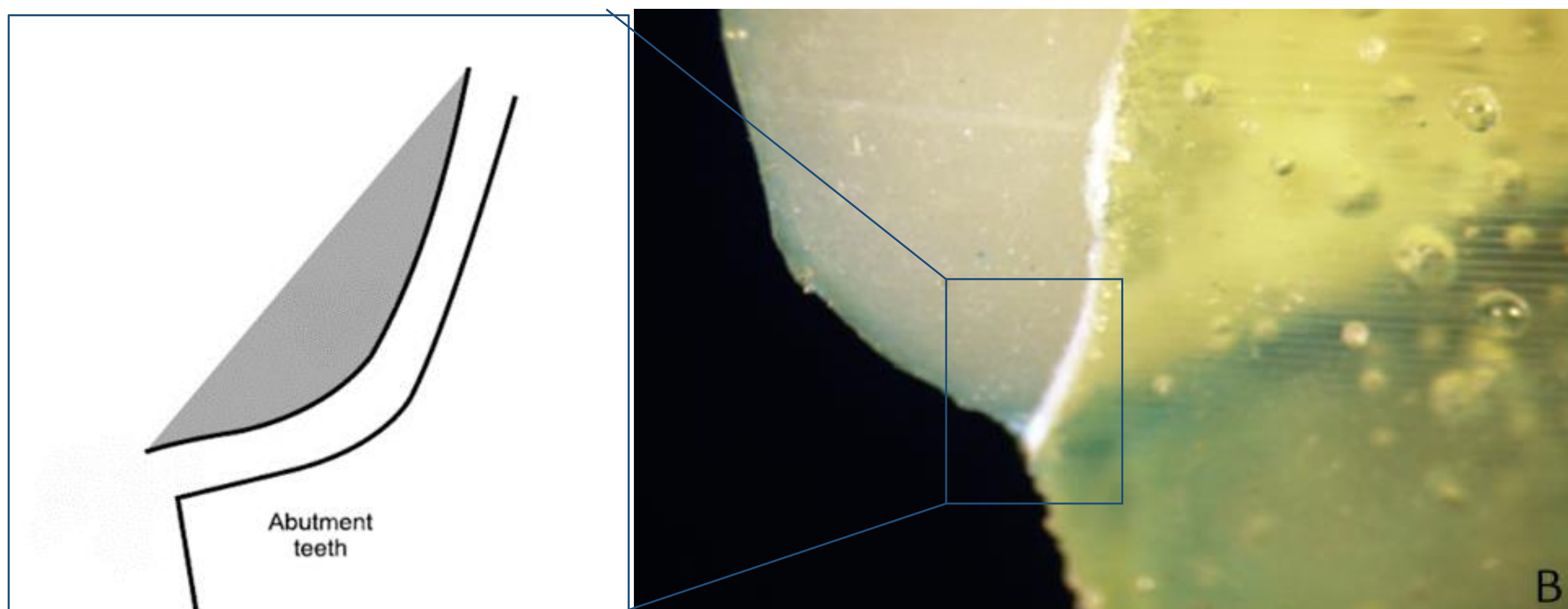
To determine the difference in the marginal accuracy at buccal, lingual, mesial and distal margins of temporary crowns fabricated with Protemp 4 versus Integrity crown and bridge material

Hypothesis

H₀: There is no difference in marginal accuracy in temporary crowns fabricated with Protemp 4 and Integrity crown and bridge material

Marginal discrepancy

Vertical marginal misfit/gap between margin of the temporary crown and the prepared tooth model in micrometers (μm)



Material & Methods

Study Design

In-vitro experimental

Setting

Dental Clinics, Aga Khan University Hospital, Karachi

Study Duration

September – December 2019

Sample Size

Twenty-four (24)

Surfaces of Interest

Ninety-six (96)

Sampling Technique

Non-probability consecutive sampling

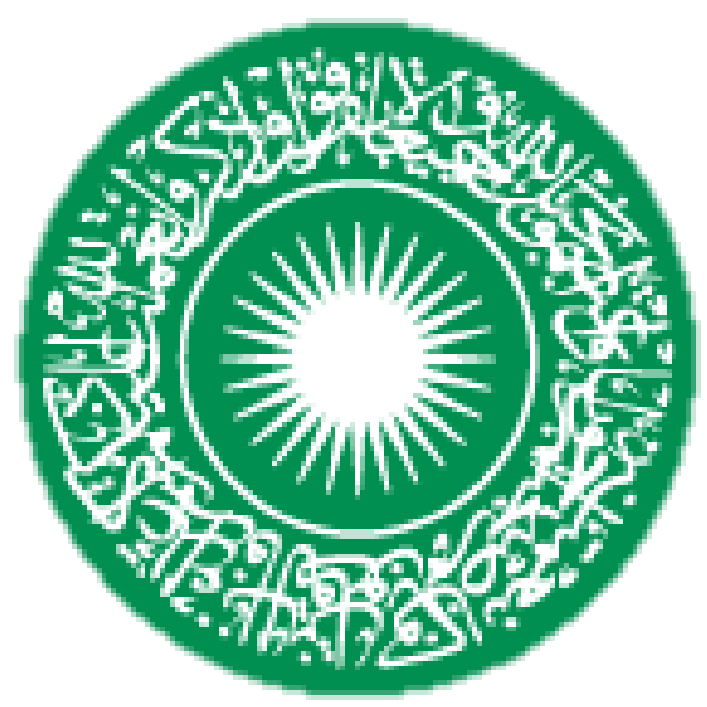
Inclusion Criteria

Temporary crowns fabricated on prepared typodont mandibular molar tooth

Exclusion Criteria

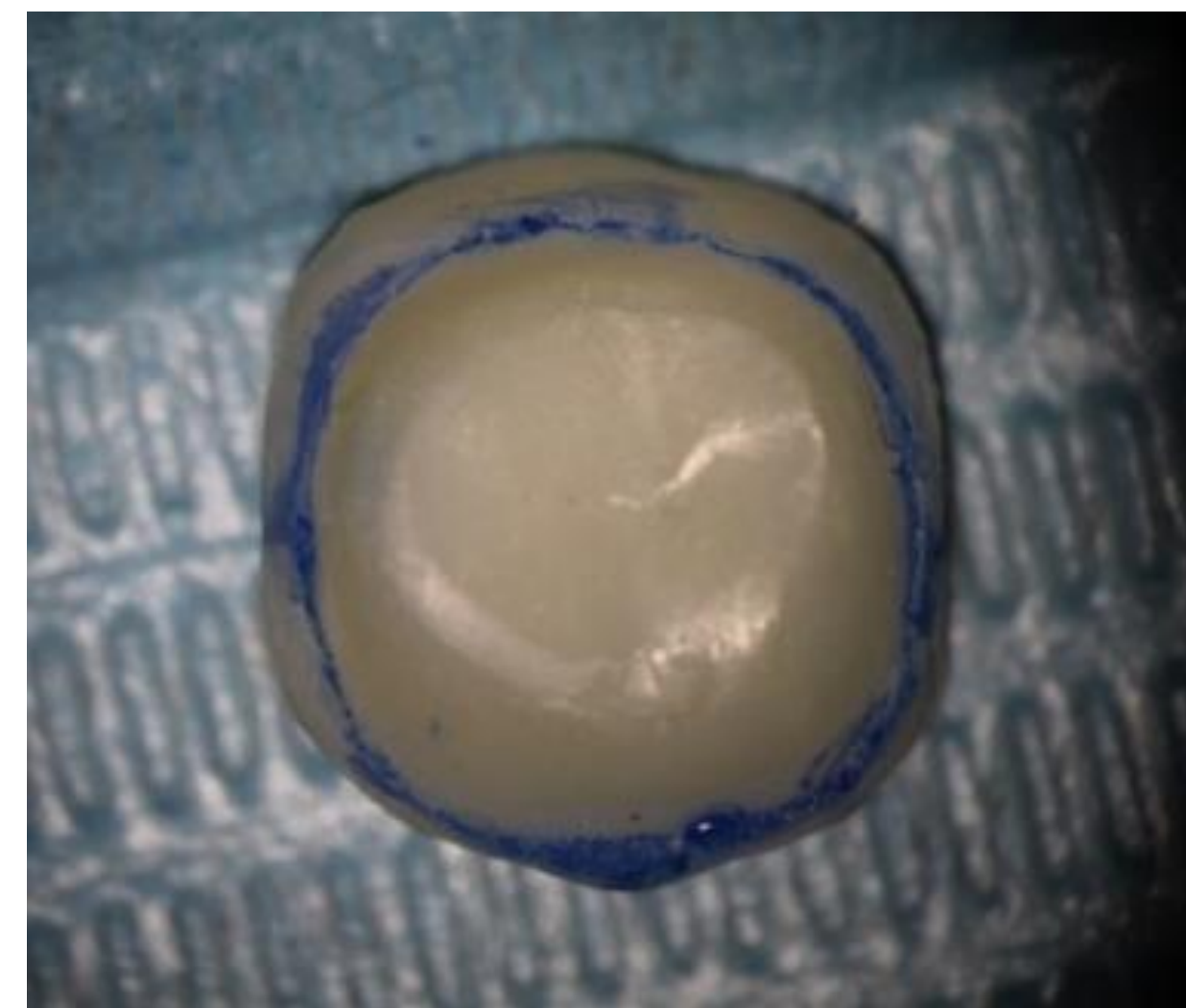
Temporary crowns exhibiting voids or cracks





Comparison of marginal accuracy in two different materials used in provisional crown and bridge – an in vitro experimental study

Material & Methods



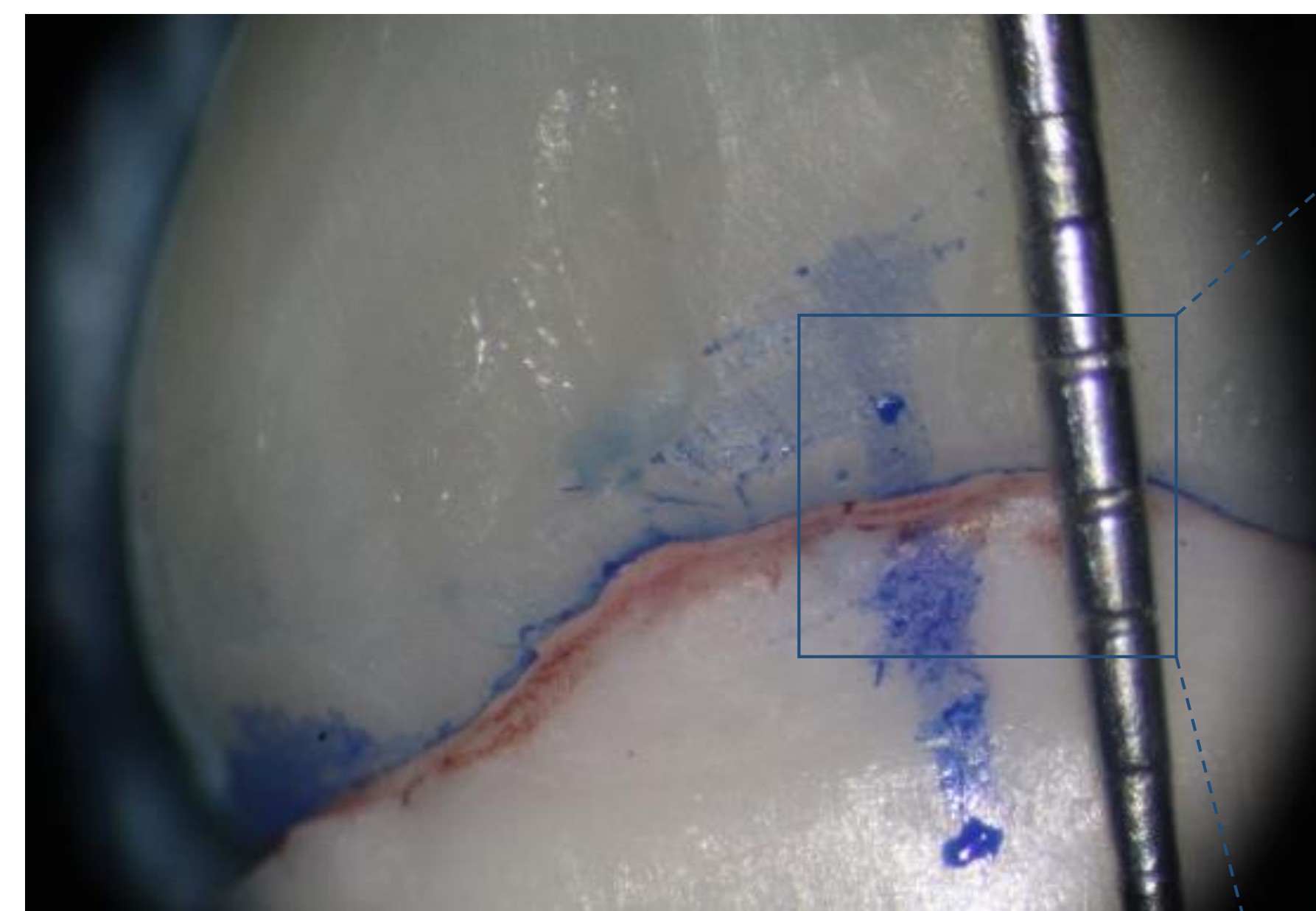
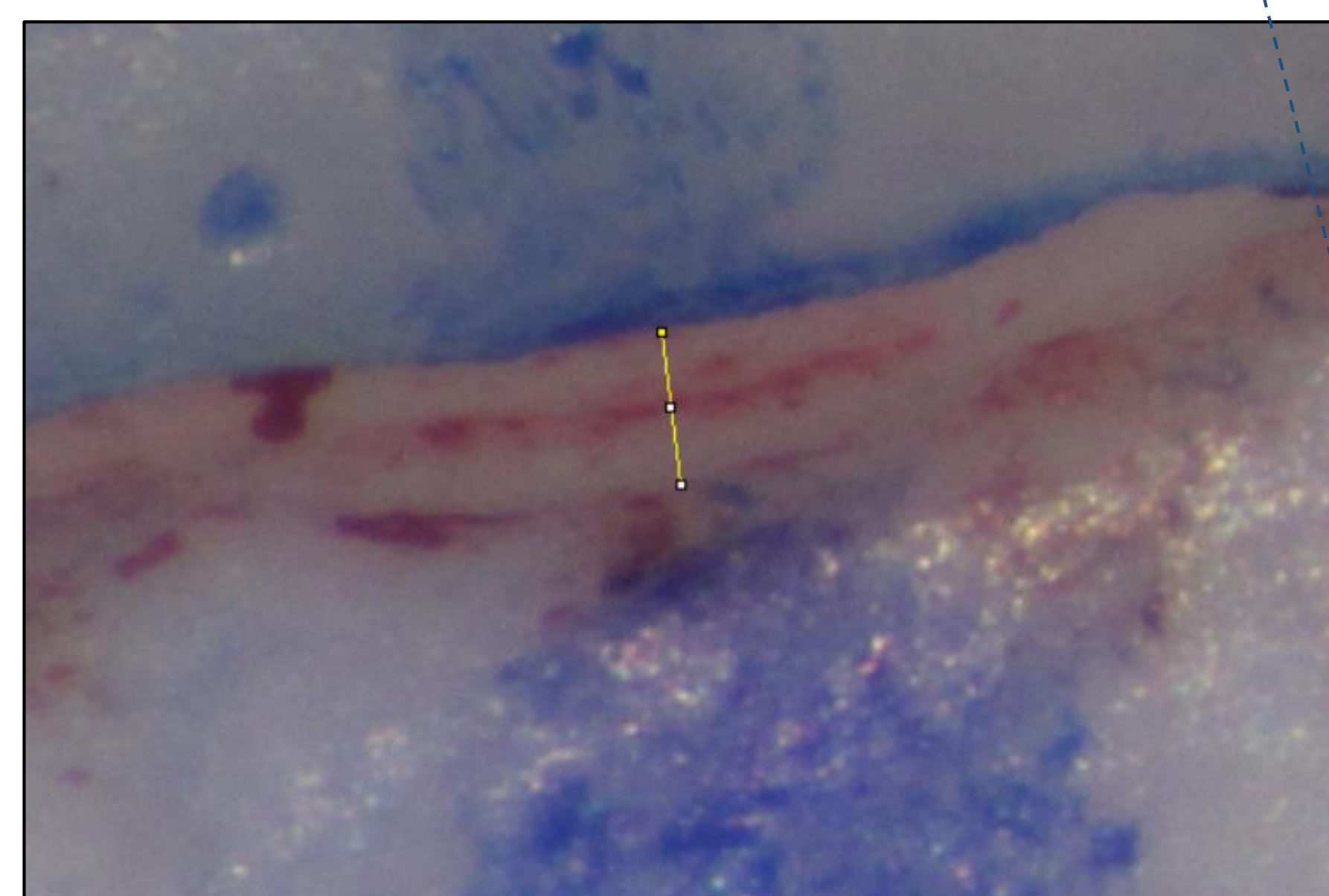
Temporary crown



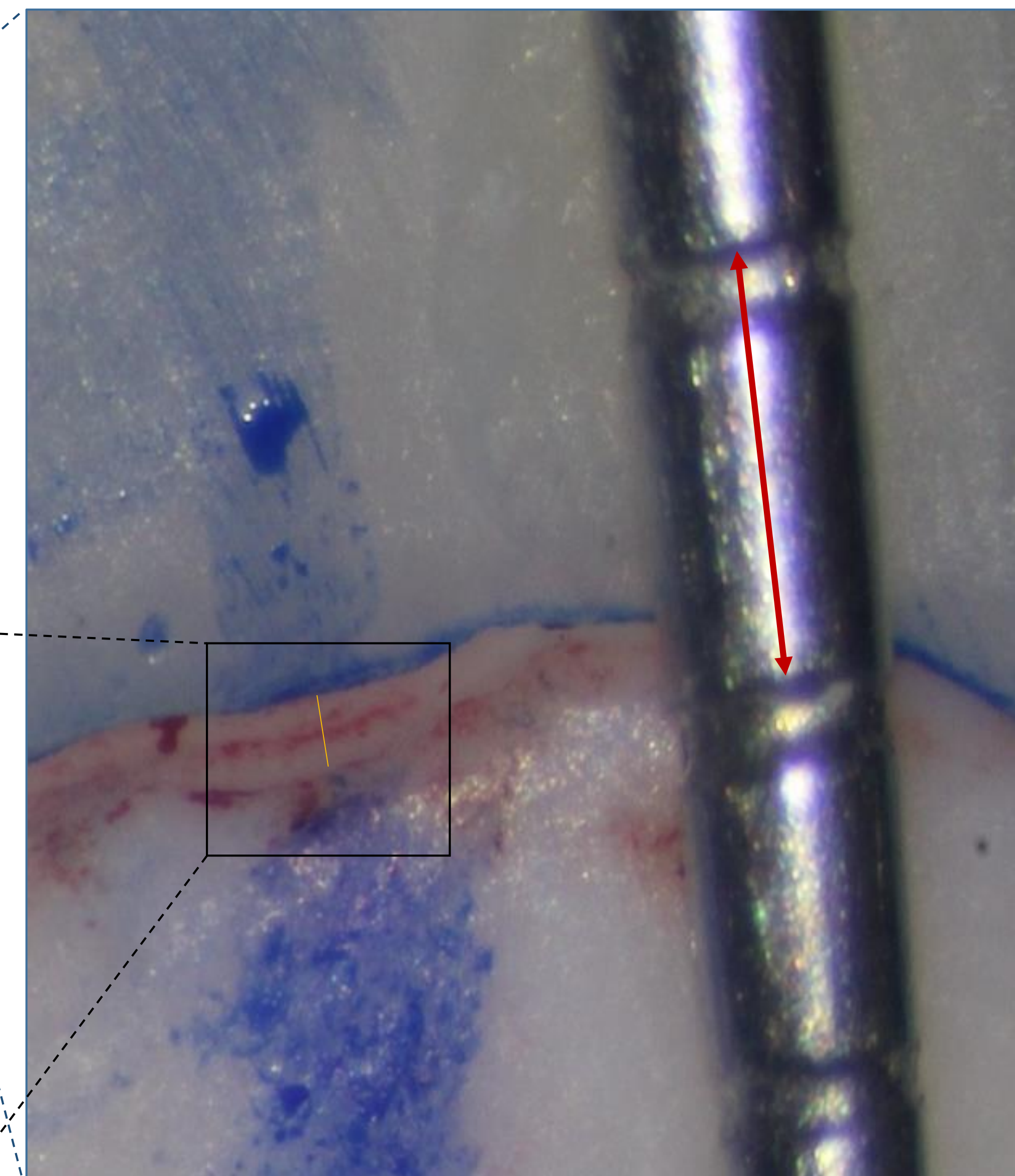
Prepared Abutment



Stereomicroscope



Software: Image J, v. 1.52a



100 μ m
Marginal Discrepancy

Results

Table I: Mean marginal discrepancy

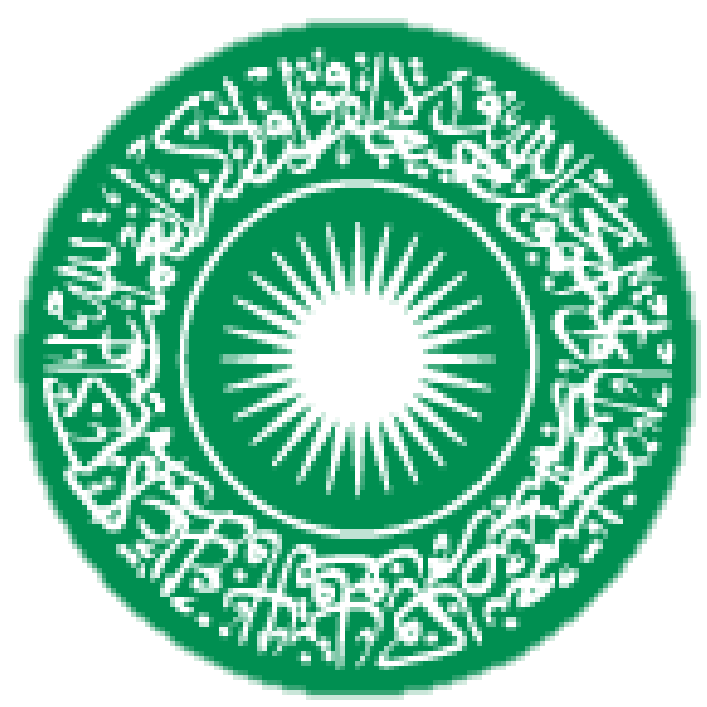
	Material	Buccal n = 24	Mesial n = 24	Lingual n = 24	Distal n = 24	
Marginal discrepancy (μ m)	Protemp 4 n = 48	582.7 $\pm$ 268.7	323.3 $\pm$ 160.9	331.7 $\pm$ 147.6	404.2 $\pm$ 207.2	410.5 $\pm$ 221.8
	Integrity n = 48	438.3 $\pm$ 153.5	271.6 $\pm$ 173.3	232.5 $\pm$ 154.8	332.5 $\pm$ 167.8	318.7 $\pm$ 175.8
<i>p</i> value		< 0.01				0.027

Independent t-test; One-way ANOVA; Post Hoc Tukey
Significant *p*-value ≤ 0.05

Table II: Effect of provisional crown bridge material, preparation wall and the interaction between the two on marginal discrepancy

	Type III Sum of Squares	Mean Square	F	p-value
Temporary Material	0.20	0.20	5.98	0.02
Surface	0.78	0.26	7.75	<0.01
Temporary Material* Surface	0.03	0.01	0.28	0.84

Factorial ANOVA
Significant *p*-value ≤ 0.05



Comparison of marginal accuracy in two different materials used in provisional crown and bridge – an in vitro experimental study

Author	Country	Material	Methodology	Prepared Specimen	Separating Media	Manipulation	Finishing Instrument	Microleakage
Javed F. 2019	Pakistan	Protemp 4; Integrity	Stereomicroscope 25.6x	Ivory	Petroleum jelly	Elevation and depression	Diamond impregnated discs	Protemp 4: 410µm Integrity: 318µm
Dureja 2018	India	Protemp 4; CAD-Temp	Stereomicroscope 40x	Ivory	None	None	Scalpel	Protemp 4: 63.44µm
Amin 2015	India	Protemp 4; Luxatemp; Visalys	Stereomicroscope 6.3x	Stainless steel	None	None	Rotary rubber cups	Protemp 4: 71.59µm
Adnan 2013	Pakistan	Integrity; Tempron	Phase contrast microscope 4x	Ivory	Petroleum jelly	None	Diamond impregnated discs	Integrity: 200µm
Givens 2008	USA	Integrity; Garant; Luxatemp	Stereomicroscope 10x	Ivory	Petroleum jelly	Elevation and depression	Acrylic bur	Integrity: 218 µm

Strengths

1. High stereoscopic magnification (25.6x)
2. Comparison of two popular material that had limited data

Limitations

1. Thickness of separating media was not standardized
2. Samples did not undergo thermocycling

Conclusions

1. Provisional crowns fabricated using Integrity showed greater marginal accuracy than Protemp 4 crowns
2. The buccal margin of the prepared abutment was the least marginally accurate
3. Marginal accuracy is significantly affected by the type of provisional material and the margins of the preparation