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Poster(Non-Competing)

An Experiment Of Using X-Ray Microtomography (XMT) To Study The Depth Of Bonding Agent Penetration Into Dentinal Tubules

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Introduction: This is a novel study of the depth of penetration of bonding agents (BA) by using a miniaturised CT-scan, XMT. The Linear Attenuation Coefficient describes the fraction of a beam of x-rays or gamma rays that is absorbed or scattered per unit thickness of the absorber. The higher the LAC, the more opaque the image is. **Materials and Methods:** The primer and sealer of bonding agent (BA) were added with contrast, iodine and tin methacrylate respectively. Each drop of the mixture were scanned for 1 hour with Mu Cat2 XMT. Linear Attenuation co-efficient (LAC) of the BA must be optimized to appear more than the enamel & dentine. 3 extracted molar teeth were sectioned up to the dentine layer and the dentine were acid etched, dried and applied with the BA. The teeth were scanned by using the same machine for 24 hours and the penetration depth of the BA was studied by using in house (Queen Mary University of London) software. **Results:** The LAC of dentine was 1.6 cm⁻¹, enamel 2.6 cm⁻¹ and the primer was 3.2 cm⁻¹. Penetration depth of BA was about 30-300um. However, the penetration depth of the BA were not homogenous throughout the dentine. **Conclusion(s):** We have demonstrated that XMT gives a clear picture of penetration depth of the contrast added primer with iodine that warrants further studies in this field.

KEYWORDS: x-ray microtomography, bonding agent, penetration, contrast