MARCH – 2019

NEWSLETTER

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Opinions and Treatment decisions for Dental Erosion

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Icelandic dentists are well educated for diagnosis and treatment of dental erosion, but more emphasizes on causative factors are needed. These are the conclusions from a recent questionnaire study among dentists in Iceland.

More priority should be given to registration, dietary and salivary analyses in patients at risk for dental erosion.

Dentists are aware of a minimally invasive approach when treating dental erosion.

At present, little is known about dental health professionals` knowledge and treatment approach related to dental erosive wear (DEW). Dental practitioners' treatment decisions, as well as knowledge, experience and awareness of DEW were investigated in this questionnaire study. Since no recommended standard treatment exists, it is challenging for dental clinicians to make the best treatment decision, both in a short and long perspective.

Icelandic dentists seemed to be well educated for diagnosis and treatment of DEW. However, little priority was given to detailed registration of the lesions, dietary information and salivary analyses in patients at risk. The study presented two cases of DEW. Icelandic clinicians would most commonly give the patient information about dietary and drinking advices, followed by recommendation on use of fluoride rinse and information about brushing technique. Dentists were aware of a minimally invasive approach when treating erosive lesions, and when the restorative treatment was indicated, resin composite appeared to be the first material of choice.

This study has been a collaboration between the Faculty of Odontology, University of Iceland, Iceland; IceMedico ehf, Reykjavìk, Iceland; Specialist Oral Health Centre for Western Norway, Stavanger, Norway and Nordic Institute of Dental Materials (NIOM), Oslo, Norway.

Figure 1. Clinical intraoral pictures of case 1 used in the questionnaire. The patient is a 28 year old woman who had an eating disorder with vomiting as a teenager, but is now healthy.

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Full text available here:
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Residual stress in bench- and furnace-cooled porcelain-fused to zirconia appliances

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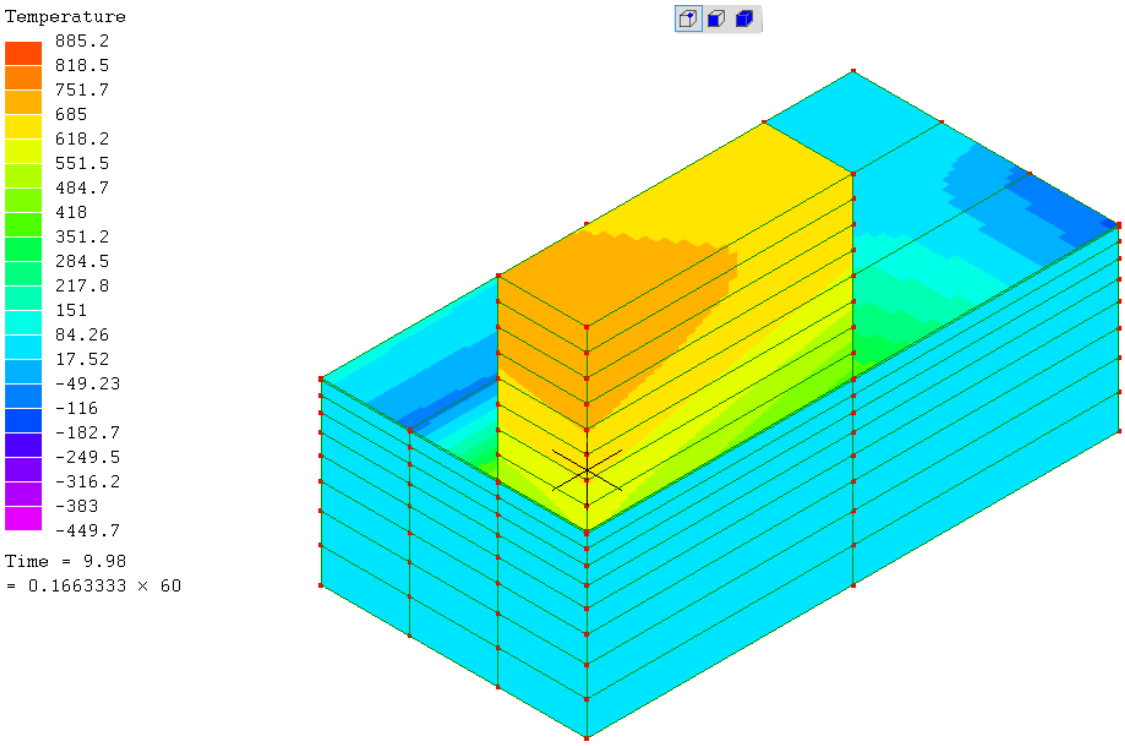
Residual stress contributes to delamination or chipping of porcelain veneered crowns and bridges. A new study[1] of veneered zirconia shows that the magnitude of residual stresses can only be estimated reliably from the manufacturers' thermal expansion coefficients if the veneered prosthesis is cooled slowly after the final firing. Fortunately, bench cooling as employed in the dental laboratory rarely attains the highest rates of quenching that the study investigated.

Rapid cooling gives insufficient time for stress relaxation or leucite precipitation.

Intricate interplay of viscosity, elasticity, thermal expansion and the glass transition.

In order to investigate the intricate interplay of viscosity, elasticity, thermal expansion and the glass transition that determines stress in porcelain fused to a substrate, one measures the bending of bi-material strips. The method has been used previously at NIOM with titanium as the substrate[2]. Now, in collaboration with a porcelain producer and the manufacturer of an optical dilatometer, the technique has been applied to porcelain-zirconia bilayer strips.
A thin substrate of zirconia was veneered with a thicker, uniform layer of porcelain and fired before cooling in the furnace or on the cooling plate. The bending of the specimen was measured throughout re-heating and subsequent cooling.

The furnace-cooled strip flexed exactly as predicted from the thermal expansion coefficients until the porcelain entered its glass transition around 500 °C. Rapidly cooled strip flexed much more strongly. Interpretation depended on finite-element analysis of temperatures during bench cooling. The explanation of the complex behaviour is that there had been insufficient time for either full stress relaxation or complete leucite precipitation after firing. These processes are reactivated on re-heating causing strips to bend first one way then the other.



Figur 1. Temperature distribution in a fired zirconia-porcelain strip 10 seconds after placement on the enamelled cooling plate.

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