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Packing Pressure Effect on Properties of Denture Base Acrylic Resins

Thursday, March 20, 2014: 2 p.m. - 3:15 p.m.

Location: Exhibit Hall AB (Charlotte Convention Center)

Presentation Type: Poster Session

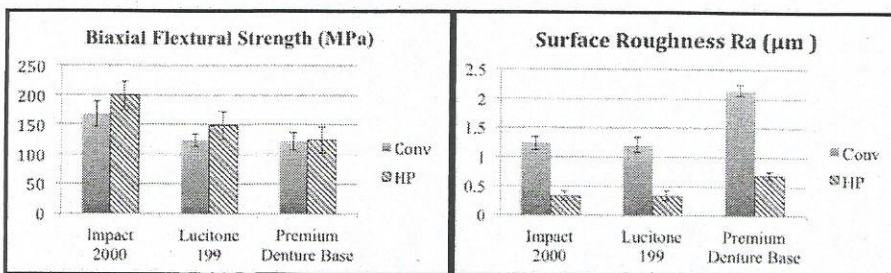
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Objective: To investigate the effect of increased packing pressure prior to polymerization of different denture base materials on their flexural strength (FS) and abrasion resistance.

Methods: Three heat curable denture acrylic resins were tested: Impact 2000 (Bosworth), Lucitone 199 (Dentsply), and Premium Denture Base (Patterson). Two different pressures were applied to each material prior to polymerization, (1) conventional (Conv) 3,500 psi and (2) high pressure (HP) 24,462 psi. Circular specimens (N=20/group) measuring 16x2 mm were prepared for biaxial flexural-strength (FS) testing in Instron machine. For Abrasion resistance rectangular specimens (N=10/group) measuring 40x15x3 mm were fabricated and polished (Mean surface roughness = $0.02\mu\text{m} \pm 0.004$), then subjected to 200,000 stimulated tooth-brushing cycles with a denture brush (Archtek) and a denture paste (Polident Dentu Creme - GlaxoSmithKline). Surface roughness (Ra) was measured using profilometry (SurfTest SJ-201, Mitutoyo). Data were analyzed using ANOVA and multiple comparison tests.

Results: Mean FS and surface roughness values for both pressure levels are displayed in the histograms:



Two-way ANOVA indicated a significant difference in flexural strength and abrasion resistance between the two packing pressures and three materials ($P < 0.0001$). The high pressure group recorded significantly higher flexural strengths two groups by approximately 20% vs. conventional pressure group ($P < 0.0001$). Also, the higher packing pressure increased significantly the abrasion resistance of the 3 tested resins by 66% to 74%. ($P < 0.0001$).

Conclusion: Results indicate that increasing packing pressure prior to polymerization of denture base materials can increase significantly the material's flexural strength and the resistance to abrasion.

Student Presenter

Keywords: Acrylics, Dental materials, Polymerization, Toothbrushes and pressure

Presenting author's disclosure statement:

I have a significant financial interest/arrangement or affiliation with an organization/institution whose products or services are being discussed in this session. I understand that I must disclose this information to the participants who attend my presentation. No

I have read the IADR policy on licensing.

Signed on 09/15/2013 by O. QUTUB

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