

The effect of different durations of induction melting on metallography and some mechanical properties of cobalt chromium alloy and denture clasp

Cobalt chromium alloy for removable partial denture can be melted by different methods such as acetylene flame with oxygen, electrical resistance and high-frequency induction. The aim of this work was to study the effect of prolonged induction melting of cobalt chromium alloy – both laboratory and clinically. All specimens prepared for testing were classified into three groups according to the duration of induction melting of the alloy; group (1) : immediate casting, group (2) delayed casting for additional two seconds, and group (3) delayed casting for additional four seconds. The increase of the duration of induction melting for additional four seconds significantly decreased the fatigue resistance of the clasp and mechanical properties of the alloy. Light and scanning electron microscopic examinations showed more carbide precipitations in the overheated group (3). Microporosities in the cast clasps were also revealed in group (3). Energy dispersive X-ray showed more chrome precipitations and decrease in cobalt content in the matrix of overheated group (3). From this study, we can conclude that prolongation of the duration of melting of cobalt chromium alloy for additional four seconds will never improve the fatigue resistance of the clasp.