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On the design of looped orthodontic retainer wires

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ABSTRACT

Removable Hawley orthodontic retainers have long been prescribed by clinicians following completion of active therapy. Only minor changes have occurred in the design of the retainer over the past 40 years. Structural, in-service failures of this appliance are typically: 1) permanent (inelastic) deformation of the as-prepared labial bow from masticatory action that induces unwanted force transmitted by the appliance to the dentition; or 2) accumulated material damage from removal and replacement of the retainer that eventually results in fracture of the labial bow. This paper reports the results of a series of experimental studies; the overall objective was the optimization of the appliance design, focusing on the labial bow. Wire size, material, temper, canine-loop height, markings for bend placements, heat-treatment of the prepared bow, and two procedures for removing and replacing the appliance were investigated. The collective outcomes suggest a combination of design-parameter values to help maximize the life of the labial bow of the retainer.

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