

**TENSILE FORCE MEASUREMENT BY USING
DIFFERENT LINGUAL RETAINER WIRES,
BONDING MATERIALS TYPES AND THICKNESS
(A COMPARATIVE IN VITRO STUDY)**

**A Thesis submitted to
The College of Dentistry, University of Baghdad
In Partial Fulfillment of Requirements for
The Degree of Master of Science
In Orthodontics**

By
Yassameen Ammar Salih
B.D.S

Supervised By
Assist. Prof. Dr. Mushriq Fawzi Al-Janabi

Baghdad-Iraq

December/2013

Sufar/1435

Abstract

The bonded orthodontic retainer constructed from multistrand wire and composite is an efficient esthetic retainer, which can be maintained long-term. Clinical failures of bonded orthodontic retainers, most commonly at the wire/composite interface, have been reported. This in vitro investigation aimed to evaluate the tensile forces of selected multistrand wires and composite materials that are available for use in the construction of bonded fixed retainers.

The study sample includes 120 wires divided into three groups, containing 40 wires each, according to the type of the wire (3 braided strands\ Orthotechnology, 8 braided strands\ G&H Orthodontics, 6 coaxial strands\ Orthoclassic wires). Then according to the type of adhesive (flowable\ Orthotechnology, non flowable\ G&H Orthodontics composites), each group was subdivided into two subgroups, with 20 wires each and according to the thickness of the adhesive (1mm, 2mm), each subgroup was further subdivided into two, with 10 wires each.

The samples were prepared for each composite in which a wire was embedded; then the composite was cured for 40 seconds and the specimens were stored in artificial saliva at 37°C in the incubator for 24 hours. Later, the ends of the wire were drawn up and tensile force was applied through Tinius-Olsen universal testing machine until the resin failed and the results were recorded in Newton (N).

The result of this study revealed that the 8 braided strands retainer wire shows the highest values of tensile force among the tested retainer wires, the non flowable composite demonstrates a higher tensile force than the flowable composite and increasing the thickness of composite overlying the wire increased the force required to detach the wire from the composite.