

3936848 DTPT/ M : MAJOR : PROSTHODONTICS ; M.Sc. (PROSTHODONTICS)
KEY WORDS : MAGNET, ATTRACTIVE FORCE, CASTING PROCESS,
KEEPER, SEM., INSTRON TESTING MACHINE

ONANONG PROMBUT : THE EFFICIENCY OF NEODYMIUM-IRON-BORON MAGNET AS A RETENTION UNIT AFTER CASTING PROCESS.
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Permanent magnets have been used with success as retention aids in many dentistry fields such as sectional dentures, overdentures, maxillo-facial prosthesis and implant dentistry, for many years. Previous studies have proved that the closed-field system has advantages over others. Its attractive force comes from the attraction between the magnetic assembly (denture part) and the magnetizable alloys or keeper (root part). The objectives of this study were:

(a) To investigate whether the casting process of the keeper has any influence on the attractive force compared to the attractive force which the manufacturer claimed, (b) To attempt to find cheaper alloys to replace the 12% gold which was recommended by the manufacturer, (c) To observe the junction between the keeper and alloys by use of SEM.

Keepers were divided into 4 groups: (i) Non-cast, (ii) cast with 12% gold, (iii) cast with 2% gold and (iv) cast with base metal alloy. Each group comprised 10 samples and each sample was tested 10 times. The measurements of attractive force were made in the vertical direction by measuring the tensile load using an Instron testing machine (Floor model 5566 with load cell 100 N) at a loading speed of 0.5 mm./min. The differences between the 4 groups were calculated using one-way ANOVA and multiple comparison tests by LSD test. For the investigation by SEM., samples were sectioned and embedded in resin block, then the junction between keeper and alloy was observed.

The outcomes of this study showed that casting procedure significantly affected attractive force between the magnetic assembly and keeper ($p < 0.05$) without a significant difference among types of alloys used ($p < 0.05$). The SEM studies showed that the preformed keeper either did not fuse to alloys after casting, or there was a gap caused by the oxidizing layer between them. This air space appeared wider in the base metal alloy group than in the other two groups.