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THE DIFFERENCE OF L-SHAPE OF ORTHODONTIC WIRE IN ACRYLIC PLATE ON THE PRESSURE STRENGTH

INTRODUCTION

Orthodontic treatment is aimed at correction malocclusion in order to obtain healthy occlusion, both in its functional and aesthetical aspect, satisfaction and stability

Removable orthodontic appliance consists of several parts, baseplate made of acrylic and attached on the palate or bottom of the lower jaw. Active component made of stainless steel wire function to move the teeth into desired place. Retention is used to bear the component so as not removed from the mouth and anchorage.

Many kinds of wire bends that can be made as the basis of retention clasps, labial bow, or pear-ear in the manufacture of orthodontic removable orthodontic appliance. Of the many variations of shape it, bend can be grouped into three groups: a) basic groups with retention resembles the letter L to the end of the rectangle. b) basic groups with retention of the O-like shape with circular ends of wire bends, c) basic groups with retention of bend wire zig-zag or meander

In orthodontic clinic, a wire tag commonly used is L-shaped, however, determining its length is merely based on the tasted of operators, L-shaped tag allows them more easily use it.

The orthodontic materials above not only consider the aesthetic value but also have good strength. The strength of a material is defined as the average strength capacity in which a material show plastic deformity in certain amount or the presence of fracture of certain material with the same size and shape.



Fig 1.A: Removable Appliance

Fig 1.B: Component of Removable Appliance

Fig 1.C: Three kinds of orthodontic wire bends each with two variables, a) form an L, b) form the letter O, c) zig-zag

Fig 1.D: Configuration of wire bends in the acrylic plate removable orthodontic appliance

AIM

To observe the difference of L-shaped tag length of orthodontic wire in acrylic plate on the pressure strength

MATERIAL and METHODE



Fig 2.A: Glass plate, stainless steel wire and digital sliding vernier
Fig 2.B: Ortho resin
Fig 2.C: KAVI
Fig 2.D: Universal Testing Machine

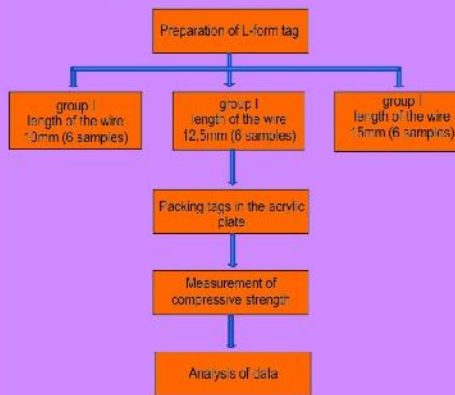


Fig 3: RESEARCH DESIGN

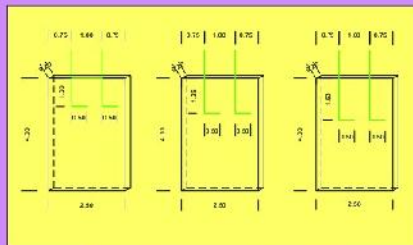


Fig 4: Study sample acrylic plate with different wire length



Fig 5.A: Stainless steel wire in acrylic base plate
Fig 5.B: Compressive strength testing of acrylic plate

RESULT

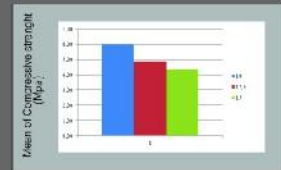


Figure 6: Diagram of red average compressive strength of orthodontic wires in the acrylic plate of length L different tag

From the analysis of test for normality (*Kormogorov Smirnov*) significance of each value is 0.710 for group I, group II and group III of 0.933 at 0.968. Significance value of each group is greater than 0.05 ($p > 0.05$). This indicates that the data from each group spread out according to the normal distribution.

From the analysis of homogeneity test (*Levene*) shows for all the groups obtained significance value of 0.575 which is greater than 0.05 ($p > 0.05$), so it can be concluded that these data are homogeneous.

DISCUSSION

The results of analysis of variance by using Oneway Anova F calculated values obtained at 4.902 with a significance value of 0.023. Significance value of 0.023 is smaller than the value of $p < 0.05$. It shows among the three treatment groups was there a significant difference (significance) of compressive strength

According Wayanardhana (2010) in his research, the form of a straight wire in the plate when the compressive strength tends to get split plate along the straight wire is compared with the wire that made a winding or coiled. It can be seen on the sample results of measurements using force measurement machine press on acrylic plate was found that the wire berbentuk letter L on the plate causes the plate split easily into two parts along a straight wire that forms the foot of the letter L.

The length of wire in the acrylic plate can affect the durability difference plate against the compressive strength. The longer the wire inside the plate acrylic plate compressive strength will decrease due to the adhesion properties of acrylic resin with a metal is zero. Because of the metal in the plate will reduce the volume and thickness of the plate. In this study the length of wire in the acrylic plate effect on the compressive strength. The length of wire in the acrylic plate that gives the greatest strength is the length of wire with a size of 10 mm and a length of wire in most small acrylic plate tekanya strength is the length of wire with a size of 15 mm.

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