Introduction
Silicone elastomers are the material of choice to replace missing facial parts which have been lost through disease or trauma. The ideal material for external facial prosthesis has been well defined. Some of the desirable properties are (1) Resistance to tear at the thin margins (2) Tensile strength and the resulting elongation gives an indication of flexibility of the prosthesis (3) Ease of moulding (4) Colour stability (5) Water absorption (6) Non toxicity and non-sensitivity to the host tissues.

• The primary goal of the maxillofacial prosthodontist is to restore the patient’s appearance, improve their self-esteem and help them lead as normal a life as possible. “Every human has the divine right to look human.” The results of the prosthetic treatment are influenced by the properties of the prosthetic material. The most common reason for refabrication of facial prosthesis is degradation of colour and physical properties.
• Silicone elastomers were first used for external prosthesis by Barnhart in 1960. The preference for silicone especially the room temperature vulcanizing (RTV) have been overwhelming. Scientific investigations have demonstrated the superiority of high temperature vulcanizing (HTV) silicones which are generally stronger, tougher, and stiffer than RTV materials. The major limitation of HTV silicone is in the fabrication. The material requires a milling machine and fabrications of metal moulds.

Aims & Objectives
To evaluate the properties of three commercially available silicone used for maxillofacial prostheses. There are various physical and mechanical properties like tensile strength, hardness, tear strength, water absorption and color stability, which affects the longevity and clinical performance of facial prosthesis. This study has been modeled to analyze both the physical and mechanical properties of three commercially available silicone rubber used for maxillofacial prostheses. The properties evaluated are

- Tensile strength
- Tear strength
- Hardness
- Water absorption

Materials and methods
The dumbbell shaped specimens were made to measure tensile strength and tear strength, rectangular shaped specimen for hardness, and disk shaped specimens were made for water absorption. All the specimen were made using brass die, and flaking procedure for curing. (Fig 2, 3 & 4)

The tensile strength and tear strength was carried out using Housfield Testing machine, hardness using Shore a durometer. (Fig 5)

Water sorption was carried out using desicators, and later preserved in distilled water and maintained at 37\(^0\) C. and weighing was done at regular intervals.

![Fig 1a](image1a) ![Fig 1b](image1b) ![Fig 1c](image1c)

The study was conducted using three commercially available silicone elastomers used for the fabrication of maxillofacial prosthesis and type of chemical reaction and processing conditions are shown in Table I. (Fig 1a, 1b & 1c)

![Fig 2](image2) ![Fig 3](image3)

Graph 1
Graph 2
Graph 3

![Fig 4](image4) ![Fig 5](image5)

Graph IV

Results
- No significant difference in tensile strength of materials was found, however Cosmesil high compliance showed better strength over other two materials (Graph I)
- Statistically significant difference was observed between the three groups with respect to mean tear strength (P<0.05). Higher mean tear strength (Kgf) was recorded in ‘Cosmesil high compliance’ material followed by ‘Prestige elastomer’ and ‘Cosmesil standard’ respectively. (Graph II)
- Hardness of all three materials were almost same, and no statistical difference was found. (Graph III)
- Prestige facial elastomer showed higher water absorption rate than the other two materials, but it was not significant. (Graph IV).

Conclusion
Among the materials evaluated in this study ‘Cosmesil high compliance’ had significantly higher tear strength and tensile strength than other materials but not statistically significant. Hardness was almost same for all the materials. ‘Prestige elastomer’ had higher water absorption than the other two materials. Within the limitations of present study, ‘Cosmesil high compliance’ is a preferable material among the three materials. However other properties like flexibility, colour stability, biocompatibility and others have to be evaluated.

References

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