

# Exploring the resilience of Two commercial suturing materials subjected to Thermocycling and Chlorhexidine immersion: An In Vitro Study

In periodontal surgery, the most common method of wound closure uses sutures. (Moore et al, 1996) A suture material is a synthetic or natural biomaterial used for tissue attachment and blood vessel ligation. A suture's tensile strength is one of the most critical in preserving the apposition of the surgical tissues and the position of the surgical flaps until the sutures are removed.

Chlorhexidine rinsing helps to reduce biofilm formation after periodontal surgery.

Thermocycling of dental materials simulate the temperature changes in the oral environment.

**AIM OF THE STUDY :** To evaluate the durability of two commercially available suture materials (non absorbable Mersilk and absorbable Vicryl) subjected to thermocycling was evaluated and compared after immersing in Chlorhexidine mouthwash

## MATERIALS

**GROUP A** – 15 specimen Mersilk

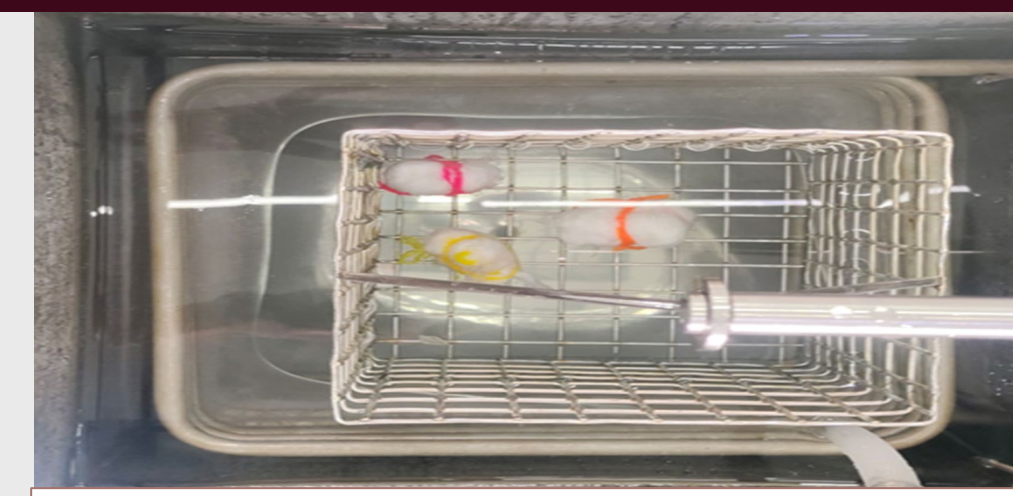
**GROUP B** – 15 specimen Vicryl

**Immersion Media** – Chlorhexidine mouthwash

## METHODOLOGY



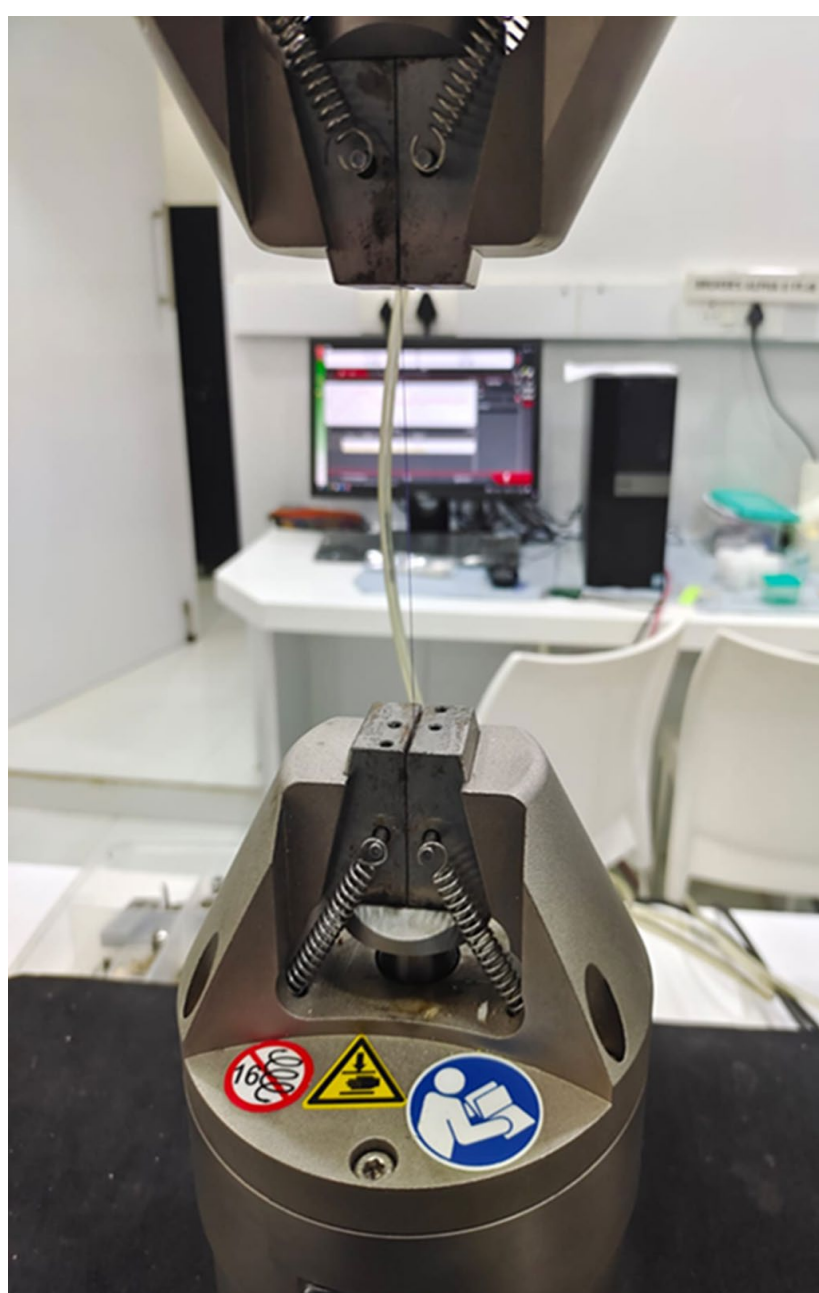
Samples prepared for thermocycling



Samples in thermostatically controlled media



Thermocycler TC 4 to simulate oral environment



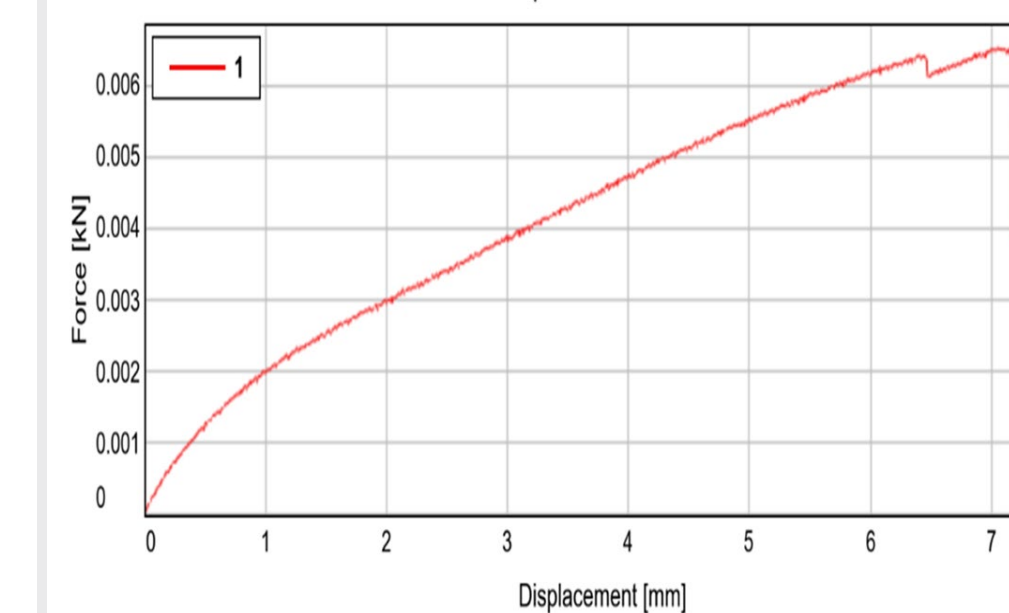
Suture material in INSTRON Universal Testing Machine E-3000

Pre immersion

Day 7

Day 14

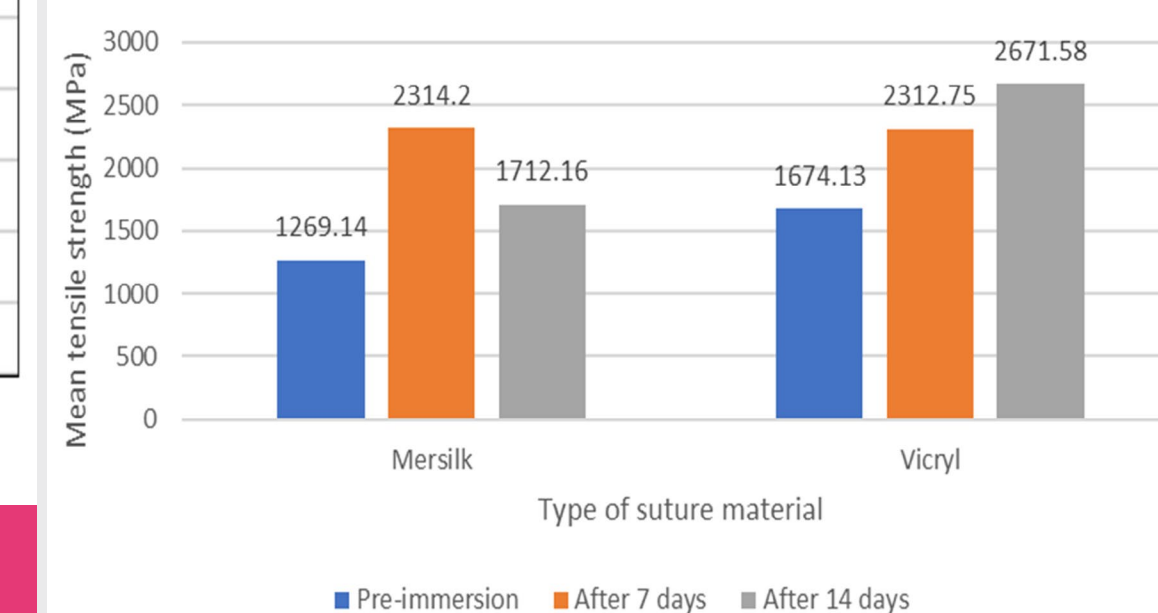
## RESULTS



The graph was plotted and the Mean tensile strength (MPa) value was recorded

## STATISTICAL ANALYSIS

Comparison of tensile strength between Mersilk and Vicryl



In the current study, Vicryl showed an increase in tensile strength when compared with MERSILK and the results were statistically significant (p-value < 0.001).

## DISCUSSION

Alsarhan et al (2018)	Tensile strength of 4-0 and 5-0 Vicryl sutures significantly increased in chlorhexidine and Listerine	<ul style="list-style-type: none"> <li>❖ Vicryl and Mersilk are most popular suture material in periodontal surgery.</li> <li>❖ The present study compared the tensile strength between absorbable and non absorbable suture material after immersion in CHX mouthwash.</li> <li>❖ This is the first experimental research of its kind that evaluated the tensile strength, of Mersilk and Vicryl by simulating the oral environment.</li> <li>❖ Therefore the current study evaluated the breaking point of Mersilk and Vicryl sutures in maintenance phase post periodontal surgery as CHX mouthwash is commonly prescribed during this phase</li> </ul>
Alamer et al (2019)	Polypropylene, Mersilk and Vicryl - immersing in artificial saliva. PP is best suture material followed by Vicryl and Mersilk respectively.	
Taysi et al (2021)	Polyglycolic acid and polyglactin 910 were considerably sensitive to immersion in artificial saliva.	
Anushya et al (2022)	Black silk and vicryl in grape and lemon juice. Tensile strength of black silk was slightly lower than the vicryl	

**CONCLUSION:** Our findings suggest the tensile strength of Vicryl sutures significantly increased in chlorhexidine immersion media. Hence, Vicryl can be preferred for the periodontal surgeries due to its retention properties for longer periods compared to Mersilk as it has less tensile strength.