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Role of Hyaluronic acid in evaluating tensile strengths of commonly used non absorbable suture materials

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1 Works for me dx.doi.org/10.17504/protocols.io.2f2gbqe

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ABSTRACT

Abstract

Objective: In Periodontics and other surgical disciplines, sutures play a detrimental role in healing of wound. The use of chemical adjuncts to boost healing has been experimented in recent years. The aim of this study is to evaluate the role of hyaluronic acid rinse in influencing the tensile strengths of commonly used sutures.

Materials and Methods: Two commonly used non-absorbable suture materials silk and polyamide were used for this in vitro study. Tensile strengths of the suture materials were determined pre and post immersion in hyaluronic acid (test) and chlorhexidine (control).

Results: Polyamide showed better stability in terms of tensile strength when compared to silk. Hyaluronic acid as a chemical adjunct did not alter the tensile strengths of both suture materials pre and post immersion.

Conclusion: This in vitro study has shown a promising property of hyaluronic acid with relation to stabilization of tensile strength of suture materials which needs to be evaluated in clinical settings.

EXTERNAL LINK

https://doi.org/10.4103/jispcd.JISPCD_343_19

THIS PROTOCOL ACCOMPANIES THE FOLLOWING PUBLICATION

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GUIDELINES

Two commonly used non-absorbable suture materials silk and polyamide were used for this in vitro study. Tensile strengths of the suture materials were determined pre and post immersion in hyaluronic acid (test) and chlorhexidine (control).

MATERIALS

NAME	CATALOG #	VENDOR
suture materials	ethicon 3-0	

SAFETY WARNINGS

NA

BEFORE STARTING

Citation: Sudhir Varma, Salim Abufanas [Ajman University}, Mohamed Jaber, Vijay Desai (03/18/2020). Role of Hyaluronic acid in evaluating tensile strengths of commonly used non absorbable suture materials. https://dx.doi.org/10.17504/protocols.io.2f2gbqe

The aim of this study is to evaluate the role of hyaluronic acid rinse in influencing the tensile strengths of commonly used sutures.

1 Two non-absorbable suture materials were exposed to two different media (1 control and 1 test) in in vitro settings and thermostatically controlled environment. The suture materials were evaluated for tensile strength at pre immersion and later at 24hrs post immersion in selected medium.

Study Materials

Tested suture materials were obtained from sterile, unexpired packets. 3-0 Mersilk^{TM}(Ethicon Inc., Somerville, NJ, USA) and 2-0 Ethilon^{TM} (Polyamide 6, Ethicon Inc., Somerville, NJ, USA).

Two experimental media which was placed in a thermostatically controlled environment were used for exposure to suture materials: Control group - Curasept ADS^{R}Mouthwash, (Curaden AG, Kreins, Switzerland), Test group - Hyaluronic acid rinse (0.2% Hyaluronic acid, 7.5% Xylitol- Ricerfarma S.R.L, Milano, Italy)

Testing method

15 samples of each suture materials were taken for each of the suture material which accumulated to a total of 30 samples (n=30). The suture materials were measured to 30cm in length. The first suture material (n=5) was tested for tensile strength at pre immersion and was calculated in N/mm^2. The sutures were then placed in a selected media for a period of 24hrs and the tensile strength was calculated .The procedure was repeated again for the second and third media respectively.

A Tinius Olsen Universal Testing Machine, Model No 50 ST (Tinius Olsen Ltd, Surrey, UK) was used to assess the tensile strength of the samples. The testing was done with an initial load cell capacity calibrated at 50N for pre immersion. The testing speed to standardize the tensile strength determination for each sample was placed at 2mm/min to avoid any structural damage to the suture material. The length of the specimen was benchmarked at 30cm. Tensile strength was determined pre immersion with a single pull till fatigue or failure sets in. For post immersion, load cell was raised gradually to 100N and was recorded at this level. This level was then kept the maximum load bearing figure.

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