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Continuous Vertical Inside-Out Versus Traditional Vertical Inside-Out Meniscal Repair: A Biomechanical Comparison

Authors:

José Leonardo Rocha De Faria , MD, MSc, Rio De Janeiro, RJ BRAZIL
Arthur P. Grimaldi Santos, M.Sc., Florianópolis, Santa Catarina BRAZIL
Douglas Mello Pavão, MD, MSc, PhD, Petrópolis, Rio de Janeiro BRAZIL
Mariana Radulski, Medical Student, Florianópolis, Santa Catarina BRAZIL
Ana Carolina Leal Oliveira, PhD, Rio de Janeiro, Rio de Janeiro BRAZIL
Ari Digiácomo Ocampo Moré, PhD, Florianópolis, Santa Catarina BRAZIL
Alan de Paula Mozella, MD, MSc, PhD Rio de Janeiro, RJ BRAZIL
Joao Antonio Matheus Guimarães, MD, PhD, Rio de Janeiro, RJ BRAZIL
Robert F. LaPrade, MD, PhD, Edina, MN UNITED STATES
Carlos Rodrigo de M. Roesler, PhD, Florianópolis, Santa Catarina BRAZIL
Rodrigo Salim, MD,PhD, Ribeirao Preto, São Paulo BRAZIL

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Disclosures:

Síntegra surgical sciences hired José Leonardo Rocha de Faria to speak at some lectures for knee surgeons, on the topic of continuous meniscal repair. José Leonardo Rocha de Faria has Meniscal Suture Device Patent Pending: U.S. Patent and Trademark Office; U.S. Department of Commerce EFC ID: 38669170 Application number: 16799372 Attomey Docket Number: 7551 JLR-1 and Dispositivo de Sutura Meniscal Patent Pending: Case Number: BR 10 2019 0233559 Patent application filled on november 6, 2019 at INPI- National Institute of Industrial Property of Brazil. Dr. Rocha de Faria reports grants from Sintegra Surgical Sciences, during the conduct of the study; personal fees from Sintegra Surgical Sciences, outside the submitted work;

Dr. Robert F. LaPrade Disclosures: Consultant for Smith and Nephew, Ossur. Royalties from Ossur, Arthrex, Smith and Nephew and Elsevier. Committees for AOSSM, AANA, ISAKOS Editorial Boards for. AJSM, KSSTA, JEO, JISPT.

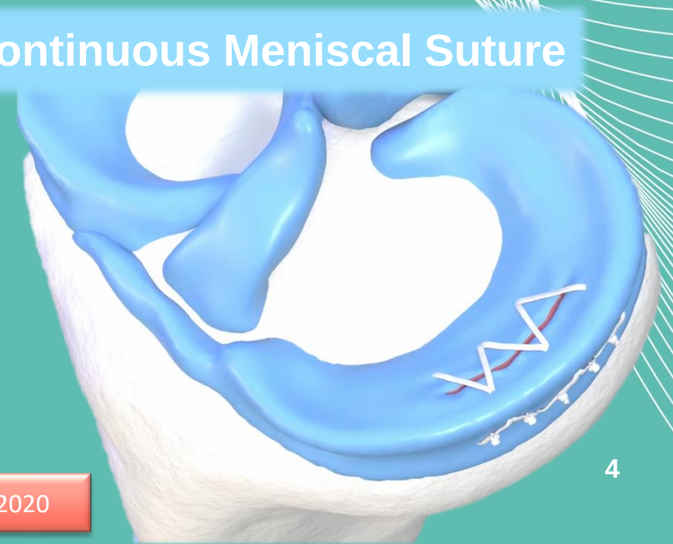
The other authors have nothing to disclose.

Sintegra Surgical Sciences contributed with the payment of the costs of the basic material, devices, sutures(and tapes) and animal models for this study.

INTRODUCTION

- Biomechanical assessment of meniscal repairs is essential for evaluating different meniscal suturing methods and techniques.

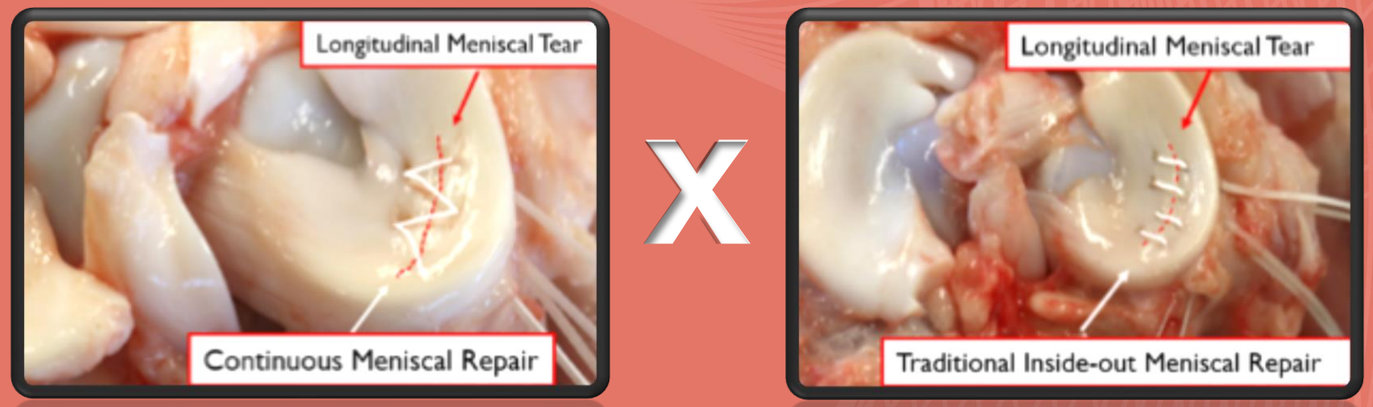
- The continuous meniscal suture technique is a new method of meniscal repair and has not yet been biomechanically evaluated



Rocha de Faria et al., Arthrosc Tech 2020

PURPOSE

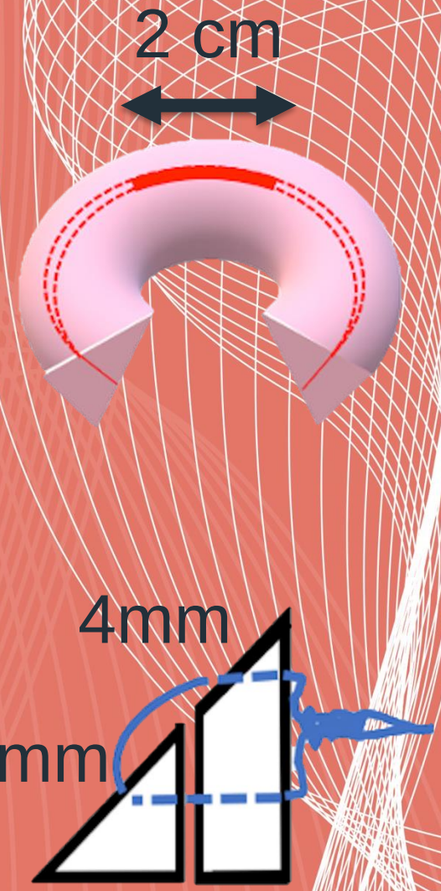
- To evaluate the displacement, stiffness after cyclical loads and load to failure for a continuous vertical inside-out meniscal suture versus a traditional vertical inside-out meniscal suture in a porcine medial meniscus.



- Study Design: Controlled Laboratory Study

METHODS

- Thirty porcine knees were acquired and divided into two test groups of 15 knees each.
- A 2.0 cm longitudinal red-white zone transition lesion was created in the body of the medial meniscus of all knees.
- The continuous suture (CS) group (group A) received four vertical stitches performed with a continuous vertical meniscal suture technique, and the traditional suture (TS) group (group B) received a traditional vertical suture with four stitches



VERTICAL CONTINUOUS MENISCAL SUTURE TECHNIQUE

- To perform the continuous meniscal suture technique the Meniscus 4ALL Device is necessary

- The step by step of technique can be seen on this QR-CODE

SCAN ME

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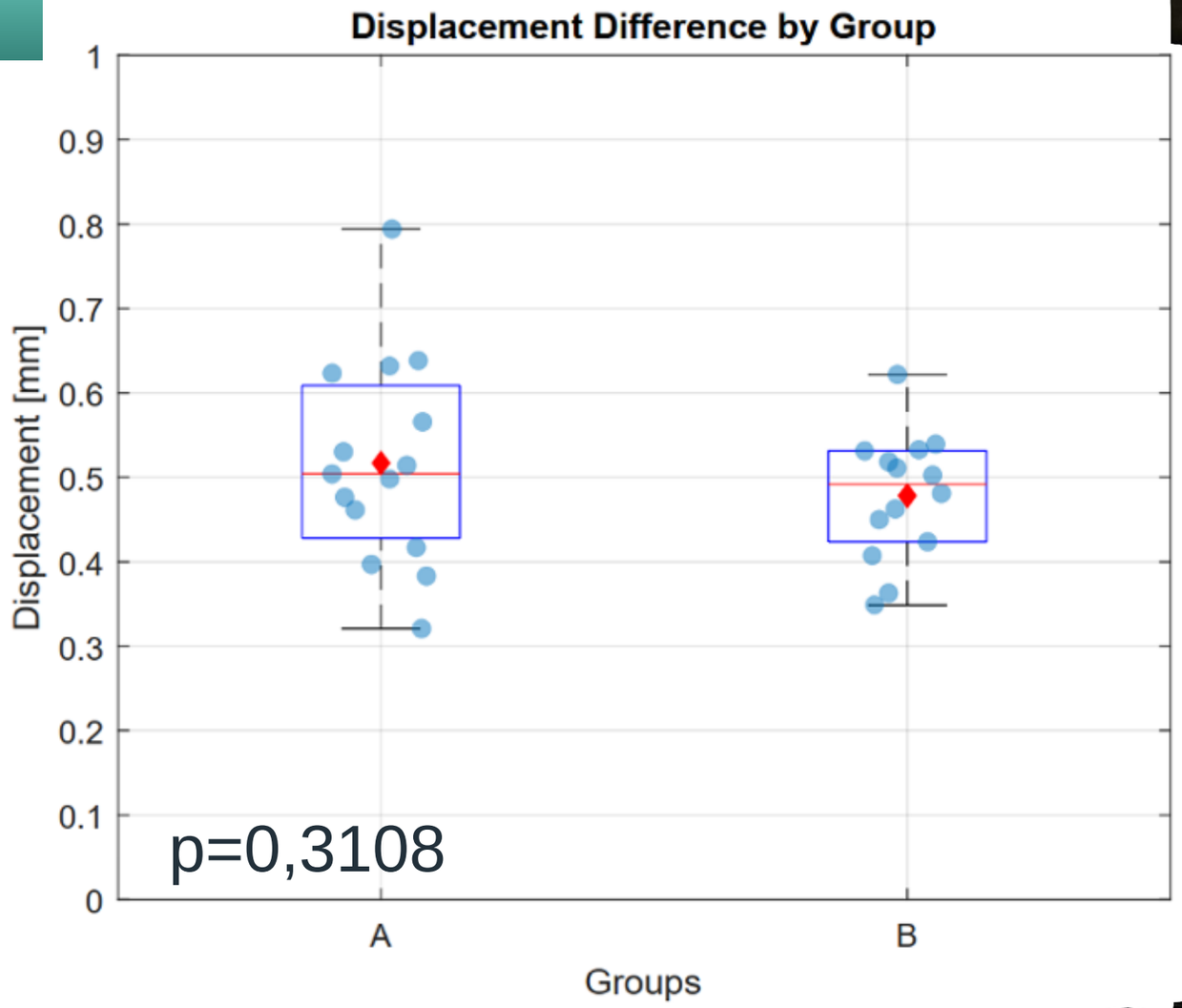
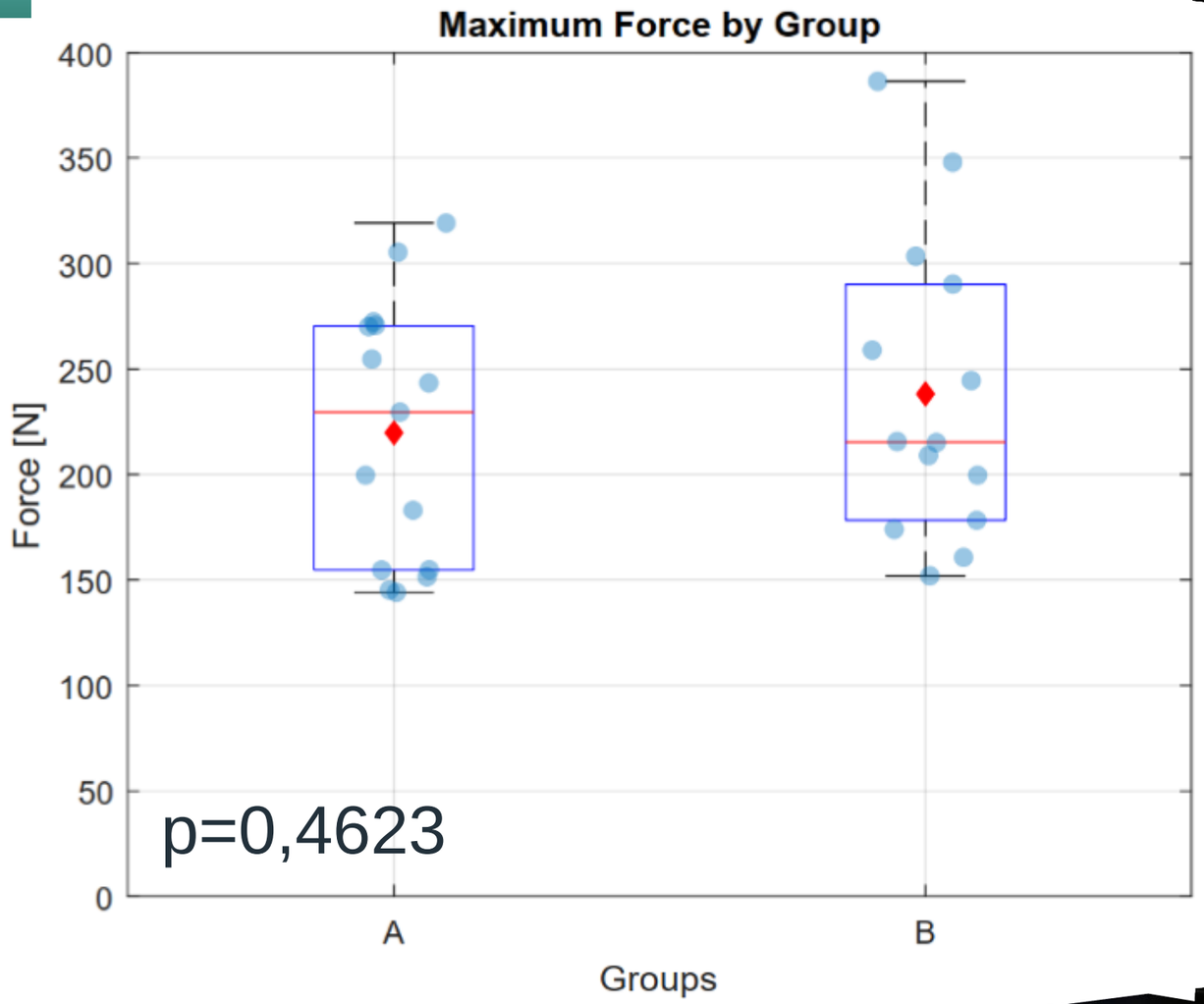
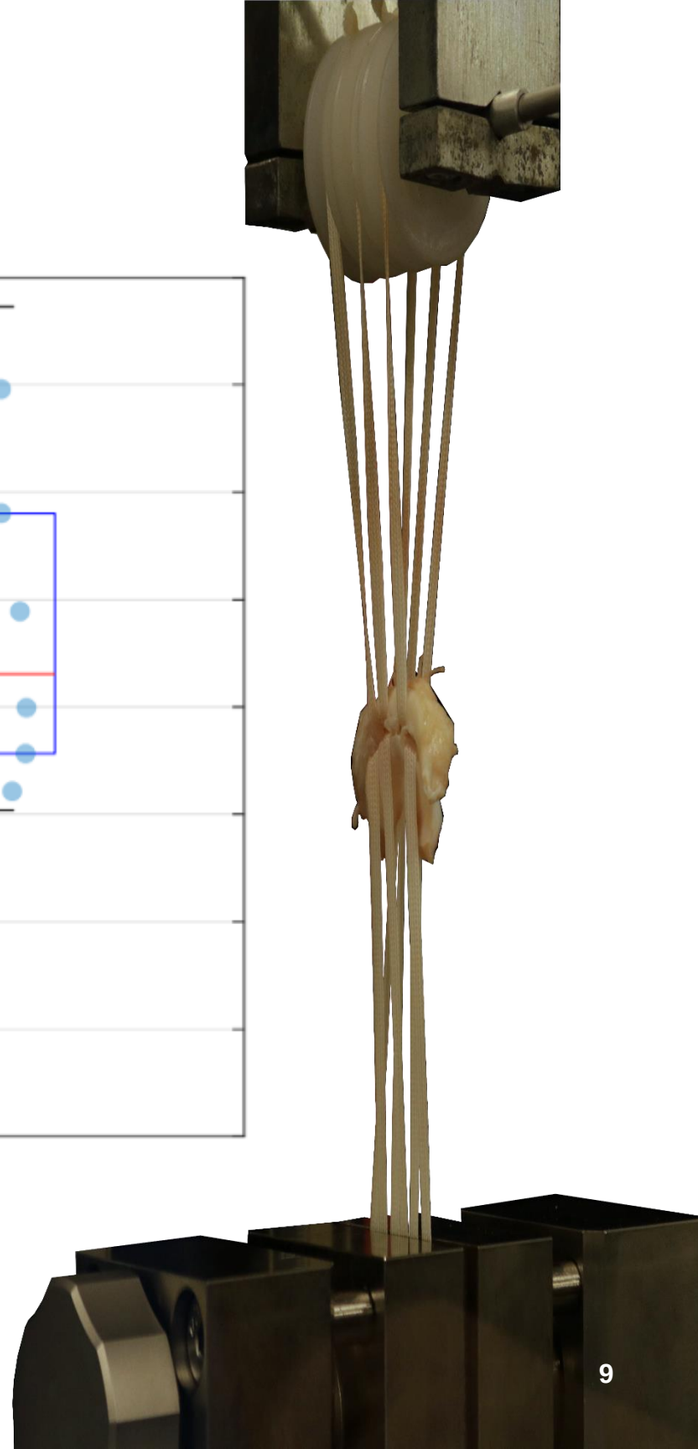
RESULTS

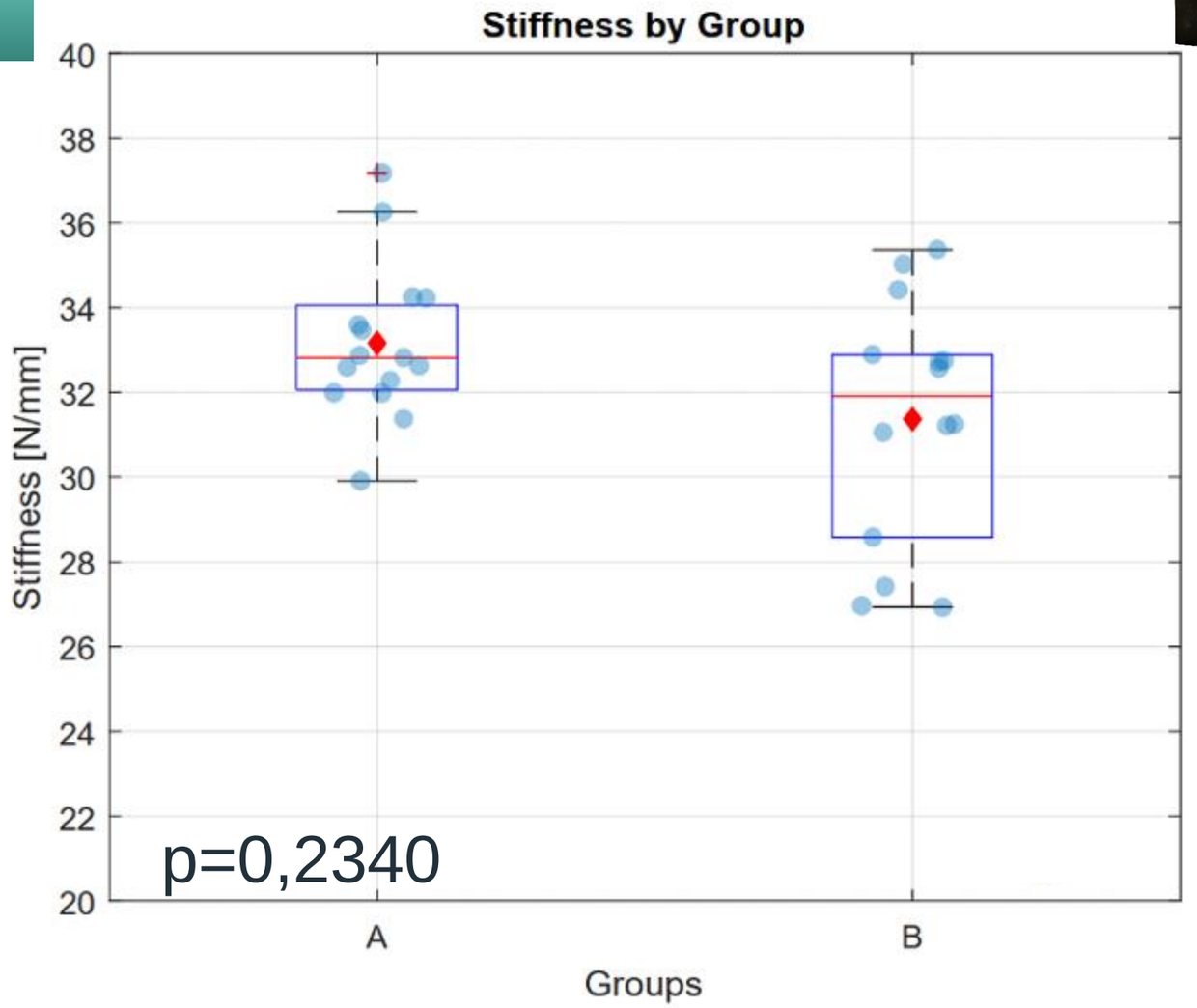

Displacement Difference by Group
Displacement [mm]
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
p=0,3108
A
B
Groups

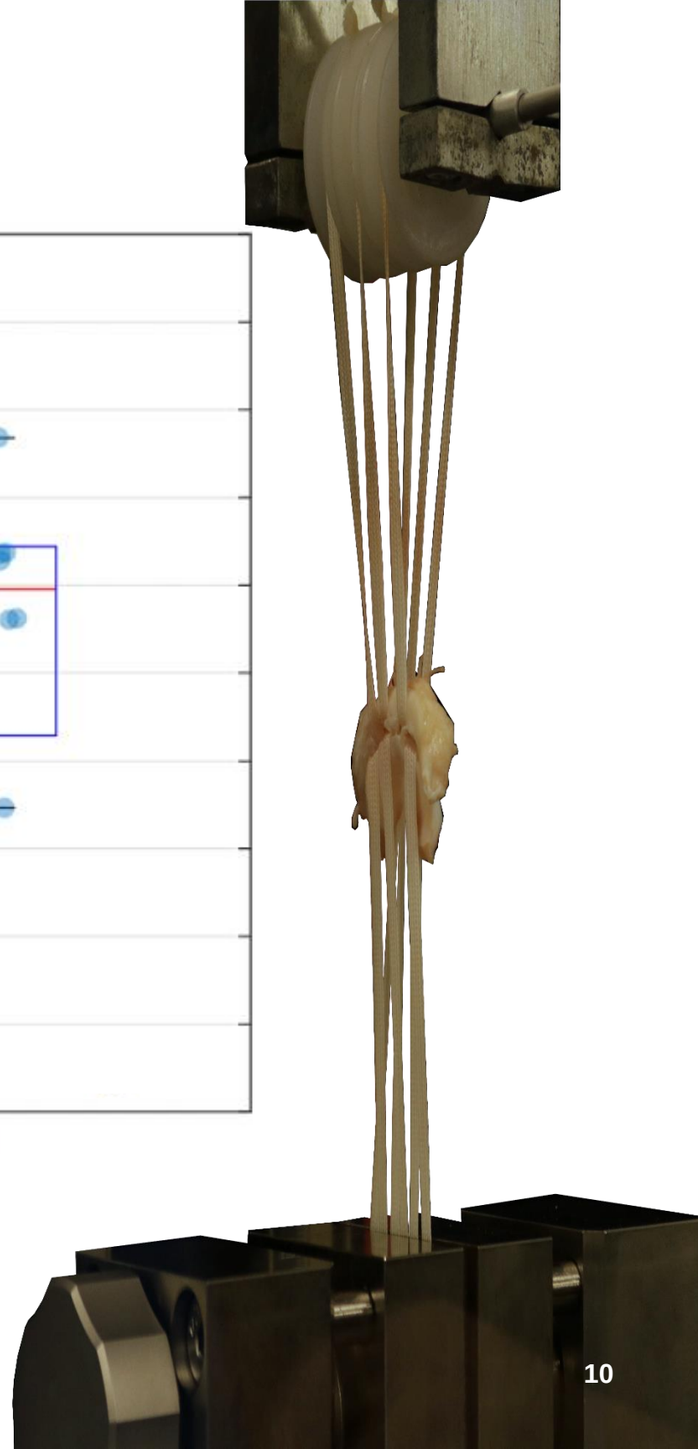
RESULTS


Maximum Force by Group
Force [N]
400
350
300
250
200
150
100
50
0
A
B
Groups
p=0,4623



RESULTS


Stiffness by Group
Stiffness [N/mm]
40
38
36
34
32
30
28
26
24
22
20
A
B
Groups
p=0,2340



RESULTS

	Widening Gap after 30 Cycles (p-value = 0.3108) [mm]			Ultimate Failure Load (p-value = 0.4623) [N]			Ultimate Load Stiffness (p-value = 0.2340) [N/mm]		
A (n=15)	0.52	±	0.12	219,9	±	61,6	36.2	±	1.8
B (n=14)	0.48	±	0.07	238,3	±	71,3	35.3	±	2.4

The most important finding of this study was that there was no significant difference in lesion displacement, system stiffness, and maximum load to failure between continuous vertical inside-out meniscal suture and inside-out vertical mattress suture techniques. This demonstrated that the continuous vertical inside-out meniscal suture is biomechanically similar to the meniscal suture, considered the gold standard treatment for longitudinal meniscal tears.

CONCLUSION

A continuous vertical meniscal suture created a beneficial configuration for treating longitudinal meniscal lesions which was biomechanically similar to a traditional vertical suture technique. Therefore, the continuous vertical suture technique appears to be a good option for the surgical treatment of longitudinal tears of the medial meniscus.

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