Achilles Tendon Repair Bio-Tape Applicator

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NEED
➢ Wyss Institute’s adhesive bio-tape will be used for Achilles tendon rupture surgeries
➢ Limitation: No applicator device → variability in bio-tape application + effectiveness

Objective: Design a device for surgeons to wrap the bio-tape around an achilles tendon

Requirements: With a single operator, wrap gel uniformly around a cylinder with 5 kPa force

SOLUTION & DESIGN

(A) Bio-gel is loaded onto applicator face
(B) Strings pulled to wrap device around tendon
(C) Device removed, bio-gel adhered to tendon

Innovation
➔ Custom made for Wyss bio-gel
➔ 3D Printed (PLA) original design

TESTING & RESULTS

Testing performed on prototype #1

Dimensions Test: ✓
Device must fit biotape dimensions and the handle must be ergonomically sized

Surface Coverage Test: ✗
< 75% paint transfer per quadrant on 4/5 gels

Force Test: ✗
Device must deploy at least 5kPa - test inconclusive for prototype #1

CONCLUSION

Revisions
➢ Prototype #2 has 6 panels → smoother wrap/ surface coverage around tendon
➢ Handle provides easy activation of device

Impact and Future
Our device will standardize application and increase effectiveness of the biotape for surgical tendon repairs