

Achilles tendon tissue turnover prior to and immediately after acute rupture in humans.

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Disclosure

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What do we know?

- The healthy human Achilles tendon tissue has a very limited turnover in adults
- Increased tissue turnover occurs in tendinopathic Achilles tendons
- Tissue samples from both tendinopathic Achilles tendons and ruptured Achilles tendons share some of the same features

→ Are Achilles tendon ruptures preceded by an increased tissue turnover?

Aims

1. To describe the tissue turnover of the Achilles tendon prior to rupture
2. To calculate the synthesis rate of proteins in the early healing phase

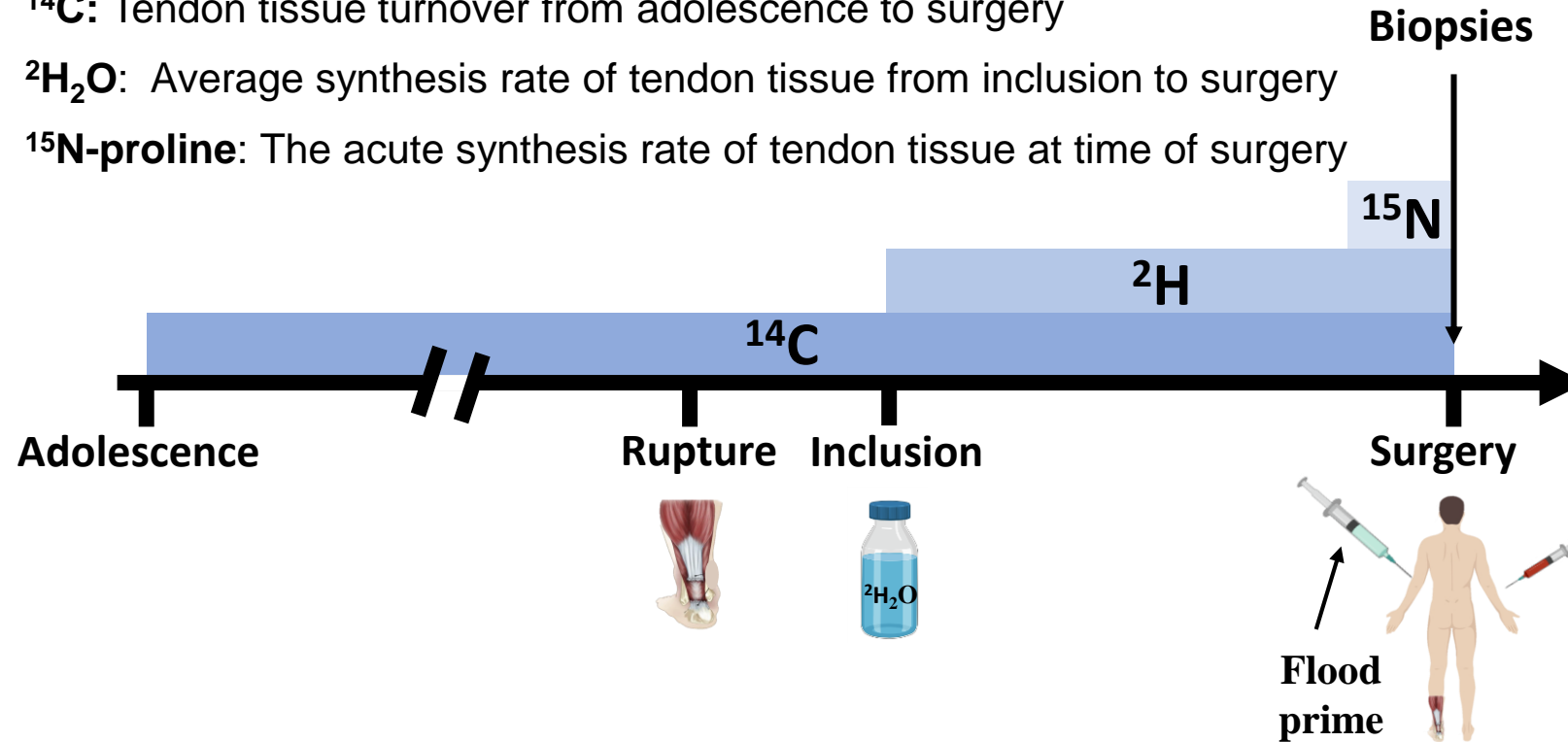
Methods

- 18 patients with acutely ruptured Achilles tendons eligible for surgery
- Seen in the outpatient clinic within 4 days after rupture
- Surgery within 14 days after rupture
- Biopsies during surgery
 - One biopsy from the ruptured part of the tendon
 - One biopsy 3-5 cm proximal to the rupture site (control)
- Biopsies were analysed for 3 different stable isotopes
 - ^{14}C
 - Deuterium oxide ($^2\text{H}_2\text{O}$) (oral ingestion at inclusion)
 - ^{15}N -proline (flood-primed continuous infusion 3-hours before surgery)

Experimental design

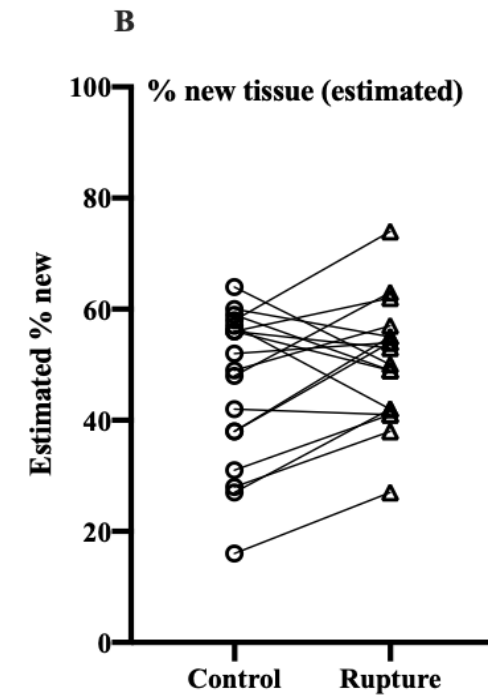
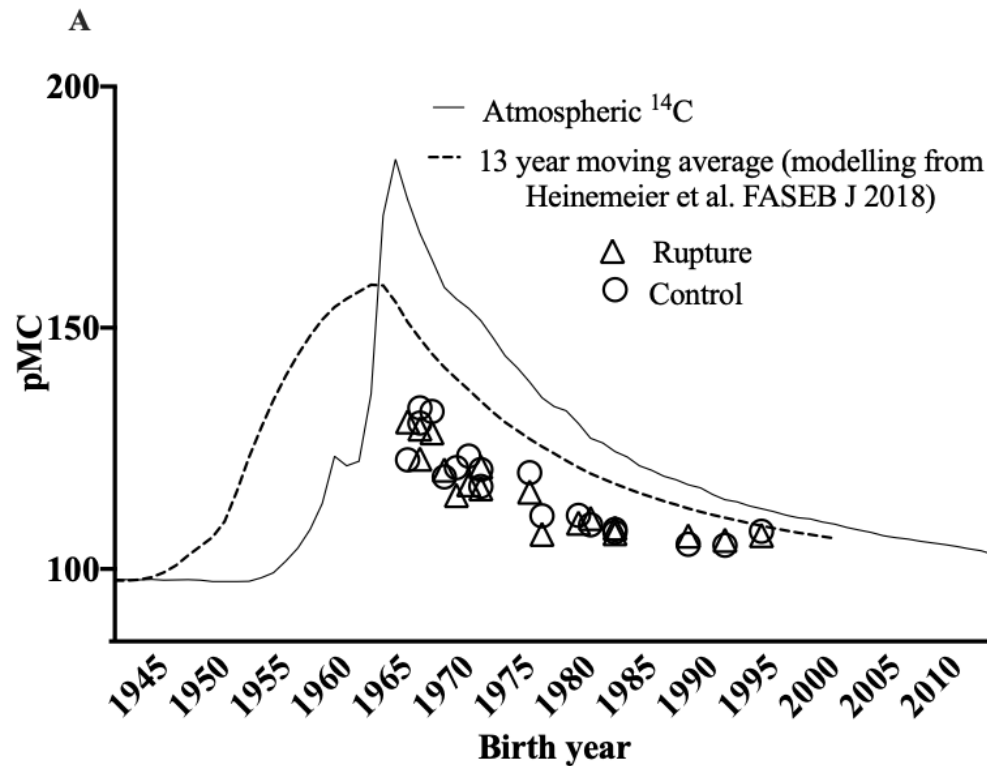
Analyses

- ^{14}C : Tendon tissue turnover from adolescence to surgery
- $^2\text{H}_2\text{O}$: Average synthesis rate of tendon tissue from inclusion to surgery
- ^{15}N -proline: The acute synthesis rate of tendon tissue at time of surgery



Results

18 patients included in the ^{14}C analysis

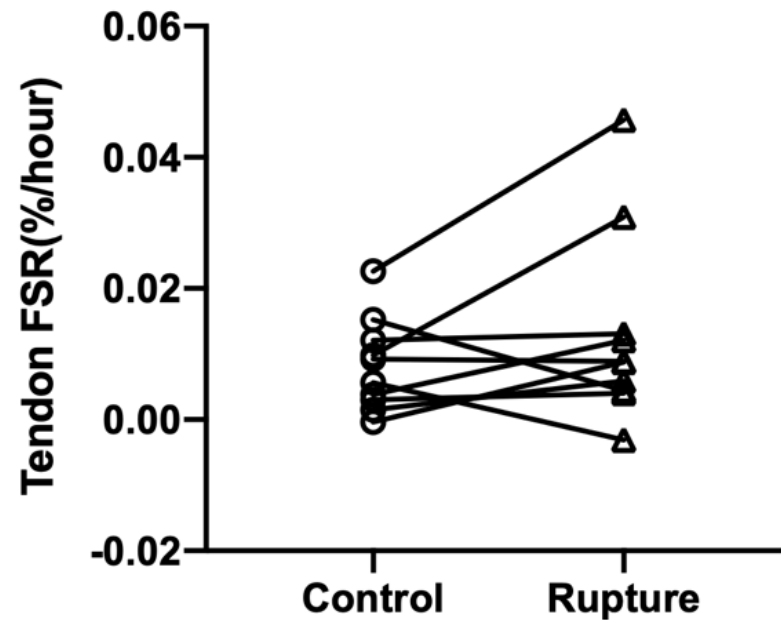


Not statistically significant

An average of 48% newly synthesized tendon tissue

Results

10 patients included in the ^2H analysis
(average synthesis rate from inclusion to surgery)



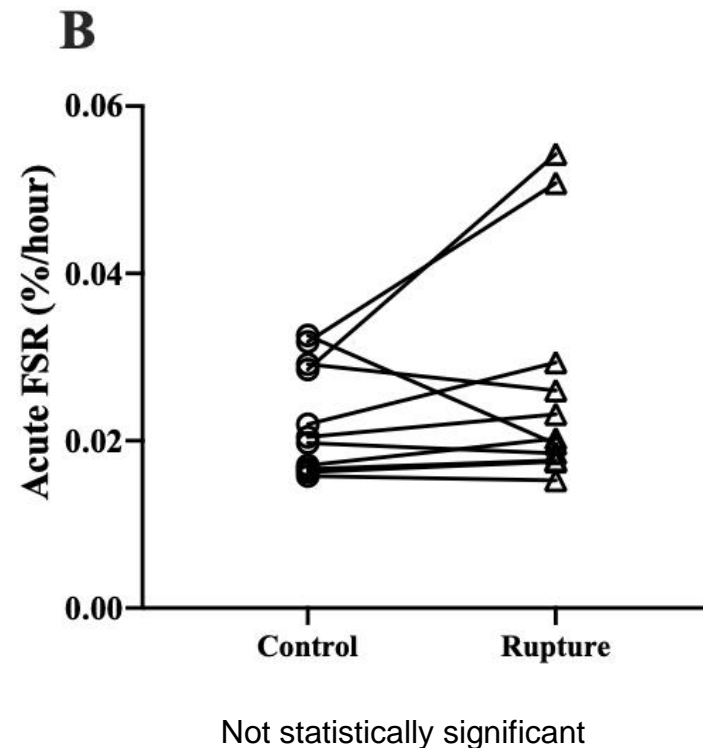
**Average synthesis rate from
inclusion to surgery: 0.01%/hour**

(for comparison, the synthesis rate in
healthy patella tendons: 0.04-0.06%/hour)

Not statistically significant

Results

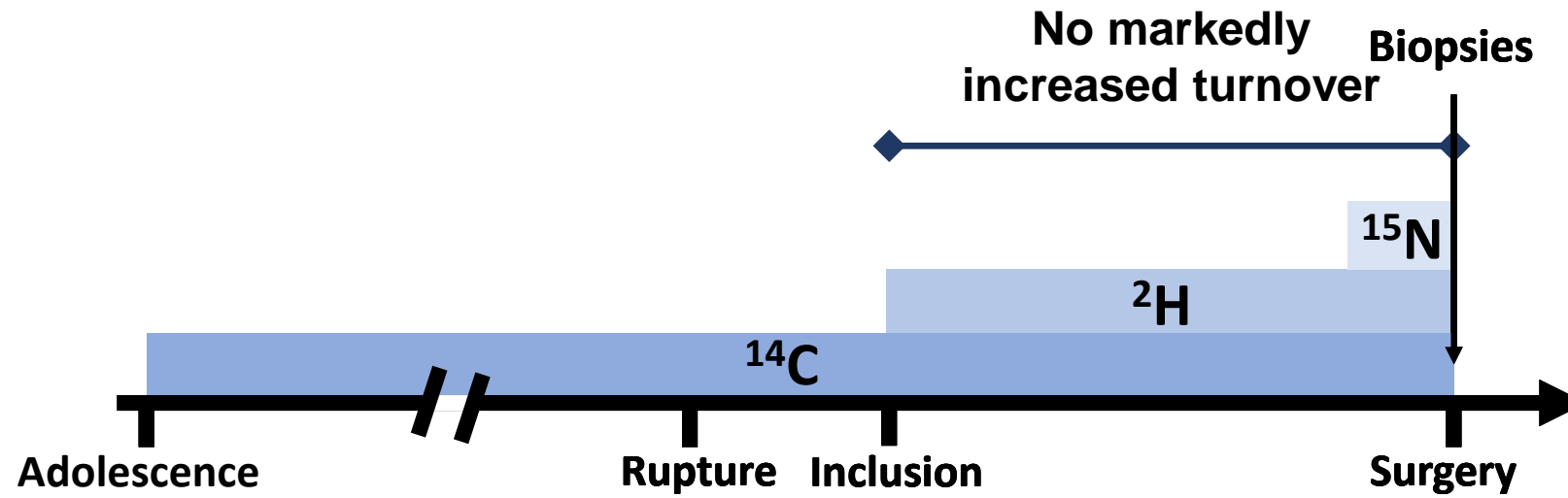
11 patients included in the ^{15}N analysis (synthesis rate at time of surgery)



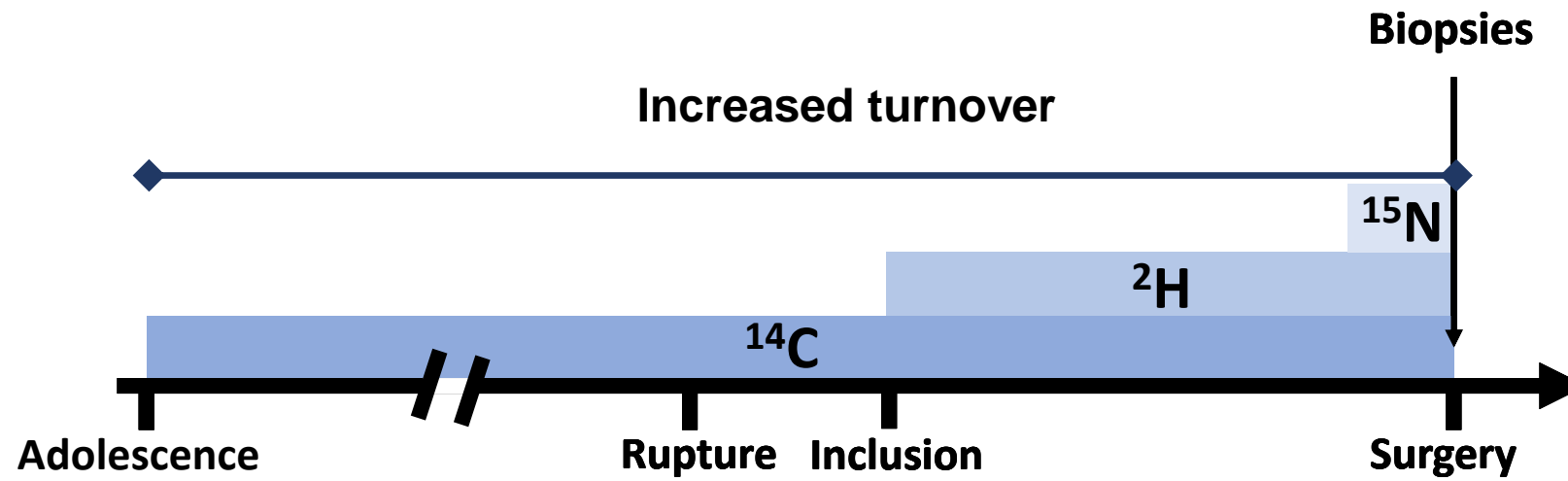
**Synthesis rate at time of surgery:
0.025%/hour**

(for comparison, the synthesis rate in
healthy patella tendons: 0.04-0.06%/hour)

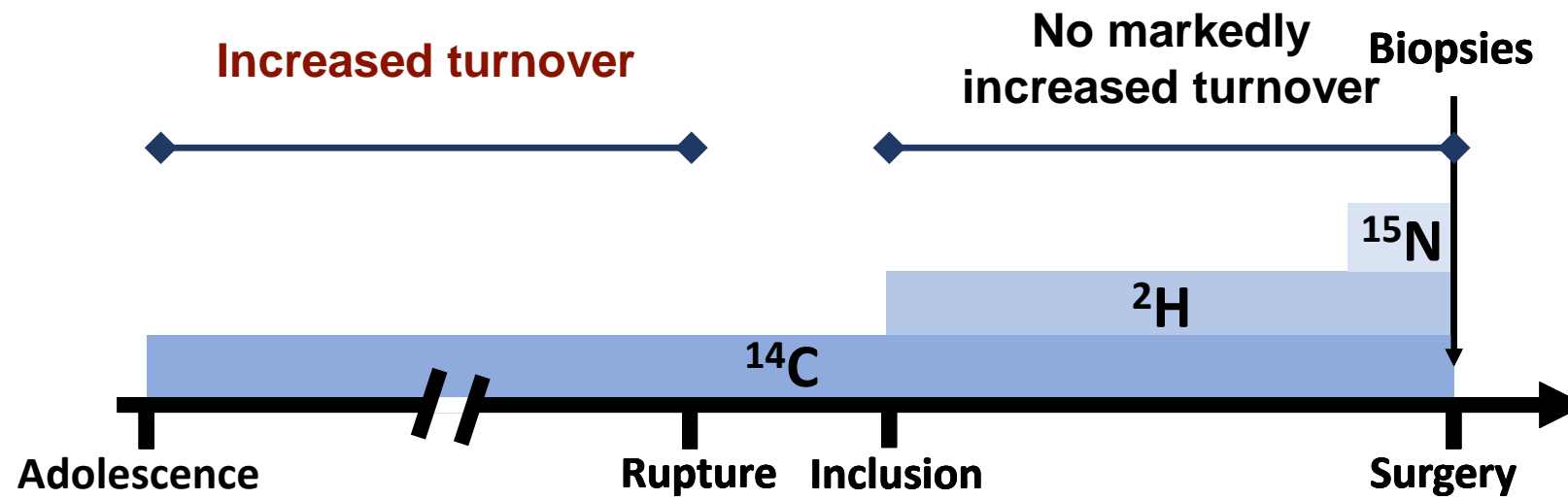
Results



Results



Conclusion



References

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