INTRODUCTION:
The etiology of de Quervain’s disease is still unknown. Repetitive motion, awkward wrist position and septation within the first dorsal compartment are considered to be possible causes. While these conditions might produce high gliding resistance and cause micro damage of the tendons and retinaculum, there have been no studies to investigate the gliding resistance to our knowledge. The purpose of this study was to measure the gliding resistance of the extensor pollicis brevis (EPB) and abductor pollicis longus (APL) tendons within the first dorsal compartment.

METHODS:
We used a tendon frictional testing device modified from a previously described and validated gliding resistance testing machine. Fifteen human cadaver wrists (mean age 76.4 years) were used. Septation in the first dorsal compartment were present in eight of the wrists. The gliding resistance was measured in seven wrist positions: 60 degrees extension, 30 degrees extension, 0 degrees, 30 degrees flexion, and 60 degrees flexion (all in neutral deviation), and 30 degrees ulnar deviation, 15 degrees radial deviation in neutral extension/flexion. The wrist position was maintained using a custom-built external fixator.

For each tendon, two-factor ANOVA with repeated measures of wrist position was used to compare the gliding resistance among the 7 wrist positions and between specimens with and without septation. When significant interactions were identified, separate 1-factor repeated measures ANOVA models were run for the specimens with septation and without septation.

RESULTS:
There was no significant difference in EPB gliding resistance between septation and non-septation (p=0.18) wrists, although there was a significant effect due to wrist position (p<0.05) and a significant interaction between wrist position and septation status (p<0.05). With septation, the gliding resistance of the EPB was significantly higher in 60 degrees wrist flexion compared to all other wrist positions tested (p<0.05) (Figure 2). In the non-septation group, gliding resistance of the EPB tendon was significantly higher in 60 degrees flexion and 60 degrees extension compared to the other 5 wrist positions (p<0.05). Although not statistically significant, there was a diverging trend between septation/non-septation at 30 and 60 degrees flexion, with septation having a higher gliding resistance. At the other wrist positions, however, the gliding resistances were very similar.

There was no significant difference in APL tendon gliding resistance comparing the septation and non-septation groups (p=0.67). Wrist position, however, had a significant effect (p<0.05) on APL tendon gliding resistance (Figure 3). In 60 degrees wrist flexion the APL tendon had significantly higher gliding resistance than the other wrist positions (p<0.05). There was no significant interaction between septation status and wrist position in gliding resistance of the APL tendon (p=0.44).

DISCUSSION:
Although statistically significant differences were not observed, there was a trend for EPB tendons with septation to have higher gliding resistance in the wrist flexion position. Higher friction associated with movements in certain wrist positions, such as pinching in wrist flexion, especially in the presence of septation, may induce surface damage, which in turn may result in inflammation.

CONCLUSION:
A combination of septation and wrist position significantly affected tendon gliding resistance and could play a role in de Quervain’s disease.

REFERENCES: