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**Supplementary materials**

This supplementary document provides further modeling and sensitivity analyses to understand the effects of our assumptions on the predicted functional outcome.

**Figure S1.** Modeled force-length curve for ECRB and BRA.

![Figure S1](image)

**Figure S2.** Effects of different tendon curve assumptions on the attachment location. (A) Normalized tendon force-strain curve determined from experiments (Loren and Lieber, 1995) and corresponding fitting results (black solid lines). (B) As tendon compliance increases (e.g., higher tendon strain at normalized force of 1), optimal attachment location moves closer to the wrist joint, regardless of optimization task.

![Figure S2](image)
Figure S3. Passive elbow flexion (A–C) and wrist extension (D–F) torque-angle characteristics post-surgery for a tendon with compliance equal to ECRL in Figure S2A.

Figure S4. Active elbow flexion (A–C) and wrist extension (D–F) torque-angle characteristics post-surgery for a tendon with compliance equal to ECRL in Figure S2A.
Figure S5. Passive elbow flexion (A–C) and wrist extension (D–F) torque-angle characteristics post-surgery for a tendon with compliance equal to ECRB in Figure S2A.

Figure S6. Active elbow flexion (A–C) and wrist extension (D–F) torque-angle characteristics post-surgery for a tendon with compliance equal to ECRB in Figure S2A.
Figure S7. Passive elbow flexion (A–C) and wrist extension (D–F) torque-angle characteristics post-surgery for a tendon with compliance equal to ECU in Figure S2A.

Figure S8. Active elbow flexion (A–C) and wrist extension (D–F) torque-angle characteristics post-surgery for a tendon with compliance equal to ECU in Figure S2A.
Figure S9. Passive elbow flexion (A–C) and wrist extension (D–F) torque-angle characteristics post-surgery for a tendon with compliance equal to FCR in Figure S2A.

Figure S10. Active elbow flexion (A–C) and wrist extension (D–F) torque-angle characteristics post-surgery for a tendon with compliance equal to FCR in Figure S2A.
Figure S11. Passive elbow flexion (A–C) and wrist extension (D–F) torque-angle characteristics post-surgery for a tendon with compliance equal to FCU in Figure S2A.

Figure S12. Active elbow flexion (A–C) and wrist extension (D–F) torque-angle characteristics post-surgery for a tendon with compliance equal to FCU in Figure S2A.
Figure S13. Comparison of peak passive (A and B) and active (C and D) torque under different tendon compliance assumptions. Note that peak passive elbow flexion (A) and wrist extension (B) torque decreases with more compliant tendons, whereas tendon compliance does not affect either peak active elbow flexion (C) or wrist extension (D) torque. However, this peak occurs at a slightly different position.
Figure S14. Predicted attachment locations with elbow weight factor of 10 and wrist weight factor of 1.
Figure S15. Predicted attachment locations with elbow weight factor of 1 and wrist weight factor of 10.