DEVELOPMENT OF A NEW DESIGNED KNIFE FOR TRIGGER FINGERS

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Trigger finger is one of the most common problems that are treated by hand surgeons. At first, conservative treatment with corticosteroid injection is usually done. This conservative treatment sometimes has the recurrence of the symptom and the risk of tendon rupture to inject it in many times.

(Purpose)

We developed a new designed knife for minimum invasive surgery of Trigger finger. The purpose of this study is to confirm the availability and safety for this treatment.

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(Materials and Methods)

This knife is composed by a small blade and a two-piece guide with an introducer of tendon sheath with the protection of the flexor tendon and the landmark of the position of the blade to protect the tissue around it. It presents a specialized shape to cut A1 pulley that manufactured a prototype for this study. Twenty-five fingers of five cadaveric hands were investigated the anatomical location and to make sure the availability and safety to cut A1 pulley.

1. For incision of this method
2. Palmar phalangeal crease (PPC)
3. Proximal end of A1 pulley

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\begin{align*}
\text{thumb} & : 5\text{mm} (4\sim 6\text{mm}) \\
\text{index} & : 22\text{mm} (21\sim 23\text{mm}) \\
\text{middle} & : 23\text{mm} (21\sim 24\text{mm}) \\
\text{ring} & : 22\text{mm} (21\sim 23\text{mm}) \\
\text{little} & : 18\text{mm} (17\sim 19\text{mm})
\end{align*}
\]

4. Length of A1 pulley (ave.)

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\begin{align*}
\text{thumb} & : 5\text{mm} (4.5\sim 5.5\text{mm}) \\
\text{index} & : 12\text{mm} (11\sim 13\text{mm}) \\
\text{middle} & : 12\text{mm} (11\sim 14\text{mm}) \\
\text{ring} & : 12\text{mm} (11\sim 12\text{mm}) \\
\text{little} & : 10\text{mm} (9\sim 11\text{mm})
\end{align*}
\]

5. Distance among neurovascular bundle

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\text{app.} 9\sim 10.5\text{mm}
\]

(Result)

The anatomical location of proximal end of A1 pulley from palmar phalangeal crease (PPC) was 5mm in thumb (4-6mm), 22mm in index and ring finger (21-23mm), 23mm in middle finger (21-23mm), 18mm in little finger (17-19mm).

The average length of each A1 pulley was 5mm in thumb (4.5-5.5mm), 12mm in index (11-13mm), middle (11-14mm) and ring (11-12mm) finger, 10mm in little finger (9-11mm).

The average distance of neurovascular bundle around the both side of A1 pulley was 9mm in thumb (8-10mm), 9.5mm in index (9-10mm) and ring (9-10mm) finger, 10.5mm in middle (10-11mm), 9mm in little finger (8-10mm)

(Conclusion)

1. We developed the new designed knife for trigger fingers, and investigated the complications with the cadaveric hands.
2. The A1 pulley were cut completely in all cases.
3. Ten tendons in Twenty-five fingers had the injury of a surface and longitudinal tear.