Dorsal injection in the treatment of trigger fingers and trigger thumb. Anatomical study

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Corticosteroid injections are **effective** for trigger digits.

The **pain** during the injection is an **always-present** side effect.

The palmar midline technique is the most used but other techniques have been also described as a **dorsal intra-sheath** technique (Foucher et al. in 1992).


As the **dorsal skin** has less density of sensitive receptors, injecting from the dorsal skin **may be less painful** than the volar technique.

The **purpose** of this study was to assess if an injection through the dorsal web is **feasible** and **safe** for an **extra**-sheath injection of trigger fingers and trigger thumb.


Anatomical study in 12 cadaveric hands.

Mean age was 83 years (range, 70–96).

An injection through the dorsal web was performed on each digit by the same author using a 25G needle. The path followed by the needle was fixed using an instant adhesive to avoid any change on its trajectory.
○ **Thumb:** ulnar dorsal injection at the **MP joint level** keeping the thumb in abduction and directing the **needle towards** the subcutaneous tissue at the **metacarpal’s head** with an angle of approximately 90° to the axis of the thumb.
**Fingers:** Through *dorsal web* with the MP joint 30° flexed and directing the *needle towards* the *subcutaneous* tissue at the *metacarpal’s head* that can be palpated with the other hand of the investigator with an angle of 45° relative to the finger axis.
A careful resection of the palmar skin was carried out.

- **Location** of the needle’s tip
- **Distance** between the needle and main structures

- The technique was considered useful when the needle tip reached the volar subcutaneous tissue near the flexor tendons sheath.

- **Risk** of major injury was considered **high** when the mean distance from the needle to the neurovascular bundle was \(< 1\text{mm}\).
Digital caliper
Precision 0.03mm
Results

- The tip of the needle reached the palmar subcutaneous tissue near the sheath of the flexor tendons in all injections.

- The overall mean distance from the needle to the neurovascular bundle was 1.63 millimeters and it was > 1mm in all digits.

- Two injuries in 84 injections (1 nerve, 1 artery) in the same hand.
Results on each digit

<table>
<thead>
<tr>
<th>Digit</th>
<th>Injections</th>
<th>Approach</th>
<th>Mean distance to nerve or artery in mm</th>
<th>Minimum distance to nerve or artery in mm</th>
<th>Maximum distance to nerve or artery in mm</th>
<th>Injured structures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thumb</td>
<td>12</td>
<td>Dorso-ulnar</td>
<td>3.08 (SD = 1.87)</td>
<td>0.25</td>
<td>6.60</td>
<td>9 FPL sheath</td>
</tr>
<tr>
<td>Index</td>
<td>12</td>
<td>Dorso-ulnar</td>
<td>1.28 (SD = 0.98)</td>
<td>0</td>
<td>3.09</td>
<td>1 nerve</td>
</tr>
<tr>
<td>Middle</td>
<td>24</td>
<td>All</td>
<td>1.63 (SD = 0.78)</td>
<td>0.58</td>
<td>3.75</td>
<td>2 interosseous and 1 pulley</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Dorso-ulnar</td>
<td>1.75 (SD = 0.69)</td>
<td>0.62</td>
<td>2.96</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Dorso-radial</td>
<td>1.51 (SD = 0.88)</td>
<td>0.58</td>
<td>3.75</td>
<td></td>
</tr>
<tr>
<td>Ring</td>
<td>24</td>
<td>All</td>
<td>1.19 (SD = 0.68)</td>
<td>0</td>
<td>2.52</td>
<td>1 artery. 1 pulley</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Dorso-ulnar</td>
<td>1.13 (SD = 0.67)</td>
<td>0</td>
<td>2.52</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Dorso-radial</td>
<td>1.24 (SD = 0.71)</td>
<td>0.28</td>
<td>2.39</td>
<td></td>
</tr>
<tr>
<td>Little</td>
<td>12</td>
<td>Dorso-radial</td>
<td>1.48 (SD = 1.21)</td>
<td>0.28</td>
<td>4.61</td>
<td>1 tendon sheath</td>
</tr>
<tr>
<td>Total</td>
<td>84</td>
<td></td>
<td>1.63 (SD = 1.15)</td>
<td>0</td>
<td>6.41</td>
<td>2 injuries (2.38%)</td>
</tr>
</tbody>
</table>

- **Safest digit was the thumb** and the most dangerous was the index.
- **At the middle finger the technique was safer from the dorso-ulnar side.**
Limitations

- Anatomical study so there is **no feedback** with patient during the injection. It would be useful to **avoid some injuries**.
- The **number of specimens** were small.
- All injections were performed by the same surgeon, providing good internal validity but limiting its **external validity**.
- A **dorsal technique** has been previously published by Foucher reporting similar results with no complications.
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- It was an **intra-sheath** technique but injecting into the sheath is not necessary = **results** in **subcutaneous** injection
- A subcutaneous technique through dorsal skin is not new, has been widely used to digital block – **familiar technique**.
A subcutaneous injection near the flexor tendon sheath can be carried out through the dorsal web with a low, but present, risk of neurovascular injury.

It could be useful for trigger digits injection although it should be assessed in a clinical study.
Thank you