Pathology of Spontaneous Flexor Tendon Rupture

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Closed flexor tendon rupture is rare. Furthermore, there is few cases of closed tendon flexor rupture which have unclear cause of mechanical and pathological factor of ruptures, spontaneous tendon ruptures.

<Objective>
To investigate spontaneous tendon ruptures which was operated surgically at our hospital.

<Materials and Methods>
5 cases 6 fingers of spontaneous tendon rupture
3 little, 1 ring, 2 thumbs.
4 fingers were ruptured at Zone 3
2 thumbs were ruptures at zone 2
All fingers had flexor digitorum profundus (FDP) or flexor pollicis longus (FPL) ruptures
3 fingers had flexor digitorum superficialis (FDS) ruptures.
1 case had fresh distal radius fracture, and 1 case had long-term steroid medication due to renal transplantation.
Another cause such as osteophytes, calcifications or fractures of hamate hook were not observed in all cases.
We investigated background of patients, injury reversals, and surgical methods, then discussed about the pathology of ruptures.

<Results>
Average age at surgery; 67.4 years (53 - 80 years).
Average follow-up period; 7.8 months (5 - 12 months).
Waiting period from injury to surgery; 328 days (5 days - 4 years).
1 male and 4 women.
4 right-side affected, 1 left-side affected.
4 dominant-side affected, 1 had nondominant-side affected.
At the time of injury, all patients had mild pain, but no one had sharp pain, hemotoma, or swelling.
All patients visited hospitals complaining disability of finger flexion. There were only 2 cases which has ruptures under the load by sports activities or works at the time of injury, and other 3 cases has no clear cause of injuries.

<Discussion>
19% of flexor tendon ruptures at our hospital had no cause such as obvious trauma or attrition rupture. Many cases had rupture of little finger at zone 3. These results were similar to the past reports. David T. Netscher JHSA 2014
However, FPL ruptures were also frequent at zone 2 and its cause is not clear.
Three cases injured at zone 3 of the little finger or ring finger FDP, which were judged to be attrition ruptures. But there was no bone spur or degenerative findings at surgery and CT images. As past reports, there were related factors such as existence of fragile part due to poor blood circulation or shearing force due to lumbrical muscle or tendon-junction. Aaron J. Bois JHSA 2007
It was considered the ruptures occured by fragility of the tendon tissue due to synovitis and repetitive micro damage at hamate hook and any anatomical factors.

<table>
<thead>
<tr>
<th>Affected fingers</th>
<th>Cause of injuries</th>
<th>Affected tendons</th>
<th>Waiting period</th>
<th>Previous disease</th>
<th>Surgical treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>74F</td>
<td>Rt little</td>
<td>none</td>
<td>FDS, FDP</td>
<td>2.5M</td>
<td>DRF(VT-20°)</td>
</tr>
<tr>
<td>62M</td>
<td>Rt little</td>
<td>tennis</td>
<td>FDS, FDP</td>
<td>1M</td>
<td>Steroid medication</td>
</tr>
<tr>
<td>80F</td>
<td>Rt ring Lt little</td>
<td>none</td>
<td>FDS, FDP</td>
<td>4Y</td>
<td>fresh DRF</td>
</tr>
<tr>
<td>53F</td>
<td>Lt thumb</td>
<td>Lifting a planter</td>
<td>FPL</td>
<td>5d</td>
<td>Direct repair</td>
</tr>
<tr>
<td>68F</td>
<td>Rt thumb</td>
<td>Making ices</td>
<td>FPL</td>
<td>3M</td>
<td>IP fusion</td>
</tr>
</tbody>
</table>

Case 80y.o. female

Fresh DRF with spontaneous 4,5 flexor tendon rupture
non-tuberculosis mycobacteria PCR negative, RF(-), MMP3(-)
Op; hamate hook resection, tendon transfer, ORIF at all once

Hamate hook was sufficiently covered with soft tissue and there was no other bone exposure which causes any ruptures