56 y/o male custodian with persistent right ulnar wrist pain, points to ulnocarpal wrist and hook of hamate region. No history of trauma or injury.

Loren Longenecker
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Avascular Necrosis of the proximal pole of the Hamate

Avascular Necrosis of the Hamate: Three Cases and Review of the Literature

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AVN of the hamate

- Rare
- Because of rarity, currently no consensus on etiology, disease presentation or best management.
- Presentation non specific
  - Most common symptoms is ulnar swelling with pain present dorsal, volar or both. If AVN of hook- volar TTP
  - Grip strength and ROM variably affected
- Etiology
  - Trauma/fracture- 5
  - Repetitive motion/microtrauma, overuse- 4
    - 2 tennis players, 1 gymnast
  - Unknown, idiopathic- 2
  - Corticosteroids- 1
- Diversity of location of AVN within hamate
  - Hook- 2
  - Proximal pole- 4
  - Total - 4
  - Distal pole- 4
- Average delay in diagnosis of 1 year
<table>
<thead>
<tr>
<th>Author, year</th>
<th>Age, years</th>
<th>Com plaints, years</th>
<th>Side</th>
<th>Etiology</th>
<th>Location</th>
<th>Treatment</th>
<th>Histology proven</th>
<th>FU</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peters 2014</td>
<td>8, F</td>
<td>1.5</td>
<td>L</td>
<td>Unknown</td>
<td>Hook</td>
<td>Excision hamate hook</td>
<td>Y</td>
<td>8</td>
<td>No pain, full strength and motion compared with other hand, QuickDASH 0</td>
</tr>
<tr>
<td>Peters 2014</td>
<td>44, M</td>
<td>1.5</td>
<td>R</td>
<td>Sports (tennis)</td>
<td>Proximal pole</td>
<td>Débridement, VBG from distal radius based on 5th ECA</td>
<td>Y</td>
<td>7</td>
<td>Pain, full strength and motion compared with other hand, QuickDASH 0</td>
</tr>
<tr>
<td>Peters 2014</td>
<td>36, F</td>
<td>0.2</td>
<td>R</td>
<td>Trauma (fall)</td>
<td>Proximal pole</td>
<td>Débridement, impaction with cancellous graft (distal radius)</td>
<td>Y</td>
<td>1</td>
<td>Disabling pain hamate region, F/E 40/0/40, UD/RD 15/0/25, grip strength 18 vs 27 kg other hand, QuickDASH 70</td>
</tr>
<tr>
<td>Mazis 2012⁸</td>
<td>58, M</td>
<td>2</td>
<td>R</td>
<td>Unknown</td>
<td>Total</td>
<td>Débridement, capitulonatohamate fusion with cancellous graft (iliac crest)</td>
<td>N</td>
<td>0.3</td>
<td>Mild pain, reasonable force, F/E 30/0/30, DASH from 25 to 17</td>
</tr>
<tr>
<td>Juon 2008⁶</td>
<td>21, M</td>
<td>0.3</td>
<td>L</td>
<td>Repetitive motion</td>
<td>Total</td>
<td>Débridement, VBG from dorsal distal radius based on posterior intersosseus artery</td>
<td>Y</td>
<td>0.5</td>
<td>No pain, resumed work, good incorporation graft and normal signal hamate on MRI</td>
</tr>
<tr>
<td>Tukenez 2005⁵</td>
<td>25, M</td>
<td>3</td>
<td>R</td>
<td>Sports (gymnast)/repetitive motion</td>
<td>Proximal pole</td>
<td>Débridement, capitothamate fusion with spongy graft</td>
<td>Y</td>
<td>2</td>
<td>No pain, grip strength and ROM equal to other side</td>
</tr>
<tr>
<td>De Smet, 1999⁷</td>
<td>66, F</td>
<td>0.2</td>
<td>L</td>
<td>Corticosteroids</td>
<td>Total</td>
<td>Proximal row carpectomy (for AVN of scaphoid, lunate and triquetrum)</td>
<td>N</td>
<td>3</td>
<td>No pain, grip strength 12 versus 17 kg other hand, F/E 30/0/60, UD/RD 20/0/25</td>
</tr>
<tr>
<td>Telfer, 1994⁴</td>
<td>16, M</td>
<td>1.5</td>
<td>L</td>
<td>Trauma (fall)</td>
<td>Total</td>
<td>Débridement, capitulotriquetrophamate fusion with cancellous graft (iliac crest)</td>
<td>Y</td>
<td>1</td>
<td>No pain, F/E 25/0/35, nonunion in CMC 5 and hamatolunate joint</td>
</tr>
<tr>
<td>Failla 1993¹⁴</td>
<td>36, F</td>
<td>1.5</td>
<td>L</td>
<td>Sports (tennis)</td>
<td>Hook</td>
<td>Excision hamate hook</td>
<td>Y</td>
<td>0.2</td>
<td>Return to sports, grip strength equal to other side</td>
</tr>
<tr>
<td>Van Demark 1992³</td>
<td>45, M</td>
<td>0.3</td>
<td>R</td>
<td>Trauma (machine)</td>
<td>Proximal pole</td>
<td>None (patient declined surgery as he was able to return to work)</td>
<td>N</td>
<td>1</td>
<td>Nondisabling pain, F/E 45/0/53, UD/RD 20/0/14, grip strength 50 versus 57 kg other hand</td>
</tr>
<tr>
<td>Vogel 1963³</td>
<td>23, M</td>
<td>1</td>
<td>L</td>
<td>Sport trauma (hockeystick on hand)</td>
<td>Distal pole</td>
<td>Unknown</td>
<td>N</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Logròscino, 1938²</td>
<td>29, M</td>
<td>0.2</td>
<td>R</td>
<td>Trauma / osteomyelitis</td>
<td>Distal pole</td>
<td>Débridement, sequester and macroscopic necrotic bone</td>
<td>N</td>
<td>0.3</td>
<td>—</td>
</tr>
</tbody>
</table>
Vascular supply of hamate

- 4 subtypes of AVN (total, proximal pole, distal pole and hook) correlate with vascular supply
- Receives blood via dorsal intercarpal arch, recurrent ulnar artery and ulnar artery at 3 non articular surfaces: dorsal, volar, medial on base of hook of hamate.
- Intraosseous anastomoses in body of hamate seen during injection studies.
- Proximal pole and hook are more prone to AVN based on vascular supply
  - Proximal pole solely depending on interosseous supply
  - Hamate hooks supplies by single vessel are more prone in cases of hamate fx
References
