Clinical Location of Hook of Hamate: A Technical Note for Endoscopic Carpal Tunnel Release

Tyson K. Cobb, MD, William P. Cooney, MD, Kai-Nan An, PhD, Rochester, MN

Endoscopic carpal tunnel release involves a limited surgical exposure to release the transverse carpal ligament* (TCL).1,2 Topographic landmarks can provide valuable reference points to enhance an operation. The hook of the hamate is a useful guide to the ulnar (safe) border of the carpal canal but can be difficult to palpate. Kaplan's cardinal line has been used to estimate the position of the hook of the hamate and the superficial palmar arch. However, the accuracy of this technique is questionable because it is based on a moving reference point, the web space of the thumb.

We report a technique to localize the position of the hook of the hamate and define key relationships of clinical importance for endoscopic carpal tunnel release.

Technique

The landmarks used to localize the hook of the hamate are illustrated in Figure 1. After the location of the pisiform is palpated and marked, a second mark is placed on the proximal palmar skin crease, in line with the midportion of the index finger or second metacarpal. These two points are then connected, forming the index-pisiform line. A second line is drawn from the midpoint of the base of the ring finger, proximally to the wrist crease at the junction of its middle and ulnar third, forming the fourth metacarpal line. The intersection of the index–pisiform line and the fourth metacarpal line directly overlies the hook of the hamate.

Materials and Methods

The technique was used to localize the hook of the hamate in 10 cadaveric upper extremities. A radiopaque marker was placed on the skin at the measured location of the hook of the hamate (Fig. 2). X-ray films were obtained in the anteroposterior plane. Radiopaque micrometers were placed in the field to allow for adjustments in magnification. The distance from the marker to the hook of the hamate was measured from the x-ray film. From anatomic dissection of cadaveric hands (n = 10), markers were also placed on Kaplan's cardinal line, the superficial palmar arch, and the distal extent of the TCL. Kaplan's cardinal line has been used to estimate the position of the hook of the hamate (Fig. 3). Kaplan's line is drawn parallel to the proximal palmar crease from the thumb web space to the ulnar aspect of the palm.3 It reportedly crosses the hook of the hamate at the level of the ulnar border of the ring finger. The position of this line is dependent on the position of the first metacarpal and then on the mobility of the first carpometacarpal joint. Direct anatomic
Patients who are candidates for endoscopic carpal tunnel release are consented and taken to the OR usually under sedation. The patient is marked, including all relevant anatomic landmarks. Incision is made between FCU and just ulnar to palmaris longus just proximal to the distal wrist crease taking care to not cut or injury the radially located palmar cutaneous branch of the median nerve. The hamate hook finder can be advanced on the ulnar side of the tunnel hugging the hook of the hamate until this hook is felt distally through the subcutaneous tissue. Then the blade assembly of the endoscope is introduced into the carpal tunnel. The surgeon's non-device hand can be used to hold and adjust the wrist, bringing the transverse carpal ligament into view through the scope. Endoscopic Carpal Tunnel Release. Case Example by Dr. James R. Urbaniak MD - Equipment: 4 mm 30 deg endoscope; hook knife; slotted cannula; long cotton padded Q tips. Anesthesia: Ensure that lidocaine does not contain epinephrine; median nerve block may be useful but does not allow the patient to demonstrate activity of the motor branch at the end of the case; local injection over proximal and distal incisions. Transection of TLC: The hook knife is placed into the obturator which already lies with in the distal incision; the blade is inserted into the mid-aspect of the TLC; the blade is then pulled from proximal to distal - the cannula and arthroscope positions are reversed; the blade is placed in the mid aspect of the TLC (where the TLC was first transected). An overview of carpal tunnel syndrome, including aetiology, relevant anatomy, clinical features, investigations, management and prognosis. Carpal tunnel syndrome (CTS) is a collection of symptoms and signs caused by compression of the median nerve in the carpal tunnel at the wrist. CTS is the most common compression neuropathy of the upper limb and is three times more common in women than men. The prevalence of CTS identified in European population studies varies from 1 to 7%, with peak incidence occurring in people aged 45-64 years. Aetiology. Ulnar carpal bones: the hook of hamate and pisiform. Floor: carpal groove formed by the palmar aspect of the proximal carpal row. A technical note on endoscopic carpal tunnel release. J Hand Surg Br. 1994 Feb;19(1):24-6. DOI: 10.1016/0266-7681(94)90042-6. The fascial roof extends radial to the hook of the hamate, which allows the ulnar neurovascular bundle to course radial to the hamate hook. The position of the ulnar nerve and artery is of particular significance for endoscopic carpal tunnel release. Most endoscopic devices are designed to divide the flexor retinaculum just to the radial aspect of the hamate hook. Utilizing cross-sectional analysis of nine cadaver specimens, we found the ulnar artery to course radial to the hamate hook in five and palmar to it in four. Therefore, the ulnar artery may be at greater risk of injury during endosco... This Clinical Practice Guideline (CPG) for carpal tunnel syndrome provides up-to-date, evidence-based recommendations for diagnostic, treatment, and postoperative procedures. Clinical practice guidelines (CPG) provide evidence-based recommendations for current orthopaedic diagnostic, treatment, and postoperative procedures. Multidisciplinary clinician work groups and AAOS staff work together to synthesize published research with the aim of providing a transparent and robust summary of the research findings for a particular orthopaedic disease topic. Clinical Practice Guideline on Carpal Tunnel Syndrome on OrthoGuidelines.org. Full Clinical Practice Guideline PDF on Carpal Tunnel Syndrome.