Palmar Midcarpal Instability

Michael D. Hwang, MD, Ryan Klinefelter, MD

Continuing Medical Education

CME INFORMATION AND DISCLOSURE

The Review Section of JHS will contain at least 3 clinically relevant articles selected by the editor to be offered for CME in each issue. For CME credit, the participant must read the articles in print or online and correctly answer all related questions through an online examination. The questions on the test are designed to make the reader think and will occasionally require the reader to go back and scrutinize the article for details.

The JHS CME Activity fee of $20.00 includes the exam questions/answers only and does not include access to the JHS articles referenced.

Statement of Need: This CME activity was developed by the JHS review section editors and review article authors as a convenient education tool to help increase or affirm reader's knowledge. The overall goal of the activity is for participants to evaluate the appropriateness of clinical data and apply it to their practice and the provision of patient care.

Accreditation: The ASSH is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

AMA PRA Credit Designation: The American Society for Surgery of the Hand designates this Journal-Based CME activity for a maximum of 2.00 "AMA PRA Category 1 Credits™". Physicians should claim only the credit commensurate with the extent of their participation in the activity.

ASSH Disclaimer: The material presented in this CME activity is made available by the ASSH for educational purposes only. This material is not intended to represent the only methods or the best procedures appropriate for the medical situation(s) discussed, but rather it is intended to present an approach, view, statement, or opinion of the authors that may be helpful, or of interest, to other practitioners. Examinees agree to participate in this medical education activity, sponsored by the ASSH, with full knowledge and awareness that they waive any claim they may have against the ASSH for reliance on any information presented. The approval of the US Food and Drug Administration is required for procedures and drugs that are considered experimental. Instrumentation systems discussed or reviewed during this educational activity may not yet have received FDA approval.

Provider Information can be found at http://www.assh.org/Pages/ContactUs.aspx.

Technical Requirements for the Online Examination can be found at http://jhandsurg.org/cme/home.

Privacy Policy can be found at http://www.assh.org/pages/ASSHPrivacyPolicy.aspx.

ASSH Disclosure Policy: As a provider accredited by the ACCME, the ASSH must ensure balance, independence, objectivity, and scientific rigor in all its activities. All authors participating in the activity are required to disclose to the audience any relevant financial relationships with any commercial interest to the provider. The intent of this disclosure is not to prevent authors with relevant financial relationships from serving as authors, but rather to provide members of the audience with information on which they can make their own judgments. The ASSH must resolve any conflicts of interest prior to the commencement of the educational activity. It remains for the audience to determine if the audience's relationships may influence the educational content with regard to exposition or conclusion. When unlabeled or unapproved uses of drugs or devices are discussed, these will also be indicated.

Disclosures for this Article

Editors

The editors involved with this CME activity and all content validation/peer reviewers of this journal-based CME activity have reported no relevant financial relationships with commercial interest(s).

Authors

All authors of this journal-based CME activity have reported no relevant financial relationships with commercial interest(s).

Planners

The planners involved with this journal-based CME activity have reported no relevant financial relationships with commercial interest(s). The editorial and education staff involved with this journal-based CME activity has reported no relevant financial relationships with commercial interest(s).

Learning Objectives

- List the physical and x-ray findings in patients with palmar midcarpal instability.
- Discuss the various proposed anatomic etiologies for palmar midcarpal instability.
- List the implicated injured or lax ligaments associated with palmar midcarpal instability.
- Describe the splint used in patients with palmar midcarpal instability.
- Discuss the surgical options for patients with palmar midcarpal instability.
- Summarize the results for surgery for patients with palmar midcarpal instability.

Deadline: Each exam purchased in 2013 must be completed by January 31, 2014, to be eligible for CME. A certificate will be issued upon completion of the activity. Estimated time to complete each month's JHS CME activity is 2 hours.

THE PATIENT

A 40-year-old, right hand–dominant man reports chronic right wrist pain and popping after a fall onto his right outstretched hand 1 year ago. On examination, he has slight volar sag of the carpus. He has a positive midcarpal shift test with a reproducible clunk.[1] Lunotriquetral shear and ballottement tests are negative. He has no signs of generalized ligamentous laxity. Radiographs demonstrate a volar intercalated segmental instability pattern without evidence of lunotriquetral dissociation such as disruption of Gilula arcs or proximal migration of the triquetrum in relation to the lunate. There is no evidence of previous fracture or dislocation or degenerative arthritis.

From the Hand and Upper Extremity Center, Department of Orthopaedics, The Ohio State University, Columbus, OH.

Received for publication March 26, 2012; accepted October 8, 2012.

No benefits in any form have been received or will be received related directly or indirectly to the subject of this article.

Corresponding author: Ryan Klinefelter, MD, Hand and Upper Extremity Center, Department of Orthopaedics, The Ohio State University, 915 Olentangy River Road, Suite 3200, Columbus, OH 43212; e-mail: ryan.klinefelter@osumc.edu.

0363-5023/13/38A03-0024$36.00/0
http://dx.doi.org/10.1016/j.jhsa.2012.10.006

THE QUESTION

What is the best treatment option to relieve pain and instability in a patient with palmar midcarpal instability?

CURRENT OPINION

Midcarpal instability is an uncommon, relatively poorly understood entity.[2] It is a form of carpal instability nondissociative with instability between the proximal and distal carpal rows. Lichtman and Wroten[2] classified midcarpal instability into intrinsic—which consists of palmar, dorsal, and combined types—and extrinsic, which results from bone abnormalities outside the carpus, most commonly a malunited distal radius. This review focuses on palmar midcarpal instability.

In palmar midcarpal instability, biomechanical studies have implicated injury or laxity to the ulnar arm of the volar arcuate ligament (triquetral-hamate-capitate ligament) and the dorsal radiocarpal ligament.[3,4] There is question as to whether certain cases of palmar midcarpal instability are caused by radial-sided injury to the scaphotrapezium-trapezoid joint, which may explain why attempts at ulnar-sided soft tissue repair or reconstruction have had mixed results.[5,6] Treatment options have included a trial of nonoperative therapy, soft tissue repair or reconstruction, and partial wrist arthrodeses, such as triquetro-hamate, 4-corner, and radiolunate arthrodesis. More recently, arthroscopic thermal capsulorrhaphy has been described.

THE EVIDENCE

Nonoperative treatment

Nonsurgical treatment consists of activity modification, nonsteroidal anti-inflammatory drugs, and splinting. In particular, a splint with a pisiform boost applying dorsally directed pressure to reduce the volar sag in palmar midcarpal instability has been proposed.[2] In 1981, Lichtman et al[7] described 10 patients with midcarpal instability. Six were satisfied with nonoperative measures. Wright et al[8] reported on a series of 45 patients, which likely included a mix of patients with palmar and dorsal midcarpal instability. Seven were treated nonoperatively, and 57% were reported to have good or excellent results as measured by the Mayo Modified Wrist Score, which evaluates pain, functional status, motion, and grip strength. It is unclear whether patients from either series had resolution of clunking or whether they just adapted to the situation.

Operative treatment

Soft tissue repair/reconstruction: In 1993, Lichtman et al[9] described surgical treatment of 15 wrists with midcarpal instability, 9 with soft tissue procedures. Among those 9 patients, 2 had volar capsular reefing, 1 had an isolated dorsal radiocarpal capsulodesis, 5 underwent distal advancement of the ulnar arm of the arcuate ligament (triquetral-hamate-capitate ligament) combined with dorsal radiocarpal capsulodesis, and 1 had a triquetral-hamate ligament reconstruction with the radial half of the extensor carpi ulnaris. The authors reported that only 3 of the 9 soft tissue procedures were successful. The 3 that were successful were in the group of 5 patients who had received distal advancement of the ulnar arm of the arcuate ligament combined with dorsal radiocarpal capsulodesis. Garcia-Elias[6] described a method by which the extensor carpi radialis brevis is used to reconstruct the triquetral-hamate-capitate ligament and the dorsal radiocarpal ligament; however, there are no long-term peer-reviewed follow-up data for this procedure.

Triquetro-hamate arthrodesis: In the same series by Lichtman et al[9] in 1993, 3 of the 15 wrists were treated with triquetro-hamate arthrodesis. These 3 were all rated as successful; however, at long-term follow-up, 2 of the 3 showed crepitation or clicking over the dorsal radial part of the wrist. Rao and Culver[10] reported on triquetro-hamate arthrodesis in 10 patients (11 wrists). At an average of 26 months' follow-up, all patients had elimination of wrist clunking, but only 7 were pain-free. Overall, the outcomes were rated as follows: 2 were excellent, 4 were good, 3 were fair, and 2 were poor. The authors noted that the stability provided by triquetro-hamate arthrodesis failed to control symptoms in nearly half the patients.

Four-corner arthrodesis: The remaining 3 patients in the series by Lichtman et al[9] in 1993 were treated with 4-corner arthrodesis, all with a successful result. Goldfarb et al[11] reviewed 8 patients an average of 34 months after 4-corner arthrodesis for palmar midcarpal instability. Clunking was eliminated in all patients, 7 of the 8 patients were satisfied with the surgery, and 6 of 8 had no pain or mild pain. The average wrist flexion-extension arc decreased from 135° to 75° and average grip strength increased from 20 to 32 kg; however, grip strength never equaled the normal contralateral side (54 kg).

Radiolunate arthrodesis: Halikis et al[12] reported on 14 wrists in 13 patients treated with radiolunate arthrodesis for wrist instability of various etiologies. Five wrists were reported to have "dynamic midcarpal instability," and it is unclear whether this was dorsal or palmar midcarpal instability. After surgery, all 5 wrists resolved the "catch up clunk" in ulnar deviation. However, 1 wrist