[Imaging]

Hand Pain in a Golfer: A Case Report of a Metacarpal Stress Injury and a Review of the Literature Regarding Return to Play in Grip Athletes

Cortie J. Rolison IV, DO,[†] and Milton Kyle Smoot, MD^{‡*}

A 19-year-old golfer presented to the sports clinic with a 2-week history of dominant-hand pain after several months of daily golf. He had a metacarpal stress fracture. This case discusses the athlete's return-to-play timeline as well as reviews the current limited literature guiding return to play in grip athletes.

Keywords: metacarpal; stress fracture; overuse; golf; return to play

Stress fractures are common overuse injuries in the athletic population. However, stress fractures of nonweightbearing upper extremity bones are much less common.¹ Metacarpal stress fractures have a unique impact on return to play in grip athletes, as evidenced by a review of case reports,^{2,4,6,8} a case series,¹ and now this case report in a golf athlete.

CASE REPORT

A healthy, 19-year-old right hand–dominant golfer presented in late summer with a 2-week history of burning right hand pain. He denied any specific injury or traumatic event. He had been playing 18 to 36 holes per day over the prior 3 months in preparation for his first collegiate golf season. Just prior to symptom onset, he did note a subtle change in his grip. Initially, the pain began during golfing but later worsened and was present with activities of daily living (ADLs) at the time of presentation.

On physical examination, his dorsal hand had soft tissue swelling and fullness as well as tenderness to palpation at the base of the index finger metacarpal and in the soft tissues between the index and long finger metacarpals. Mild decrease in grip strength was evident. He had full motion but discomfort with resisted motion testing. The extremity was neurovascularly intact.

Diagnostic imaging showed cortical reaction of the ulnar aspect of the proximal second metacarpal on radiographs (Figure 1, a and b). Magnetic resonance imaging illustrated a grade 3 (Fredericson Classification System³) stress reaction of the second metacarpal without fracture line (Figure 1, c-e).

Initial cessation of athletics did not relieve his symptoms during ADLs after 1 week, and he was placed in an orthoplast splint to immobilize the wrist through the index and long finger metacarpophalangeal joints. Calcium and vitamin D supplementation were encouraged as well. At his 1-month follow-up, he was pain free with ADLs except for writing, and thus he was instructed to begin weaning out of the splint. At the 2-month mark, he began his college semester, was pain free with ADLs, and had been able to return to putting. Chipping exacerbated his symptoms at that juncture. He continued his progression into golf and had returned to full golfing activities at 4 months.

DISCUSSION

Metacarpal stress fractures have been found in tennis,^{1,2,5,8} rowing,⁶ and softball⁴ athletes. These sports incorporate unique stresses on the metacarpals that affect return-to-play guidance.

The second metacarpal is the longest of all the metacarpals.¹ The maximum tension at the base of the second metacarpal is

From [†]Primary Care Sports Medicine Fellowship, UK Healthcare, University of Kentucky, Lexington, Kentucky, and [‡]Department of Orthopedic Surgery and Sports Medicine, UK Healthcare, University of Kentucky, Lexington, Kentucky

*Address correspondence to Milton Kyle Smoot, MD, Department of Orthopedic Surgery and Sports Medicine, UK Healthcare, University of Kentucky, 740 South Limestone, K436, Lexington, KY 40536 (email: kyle.smoot@uky.edu).

The authors report no potential conflicts of interest in the development and publication of this article.

DOI: 10.1177/1941738116676085

© 2016 The Author(s)

Figure 1. Initial (a) anteroposterior and (b) oblique radiographs and (c-e) T2-weighted coronal magnetic resonance images of the right hand. (a, b) Arrows illustrate cortical reaction of the index finger metacarpal.

Table 1. Return to play time frame of grip athletes

Sport	No. of Athletes	Time to Full Return to Play
Golf	1 (this athlete)	4 mo
Rower	1 (case report) ⁶	4 mo
Softball	1 (case report) ⁴	6 wk
Tennis	7 (case series) ¹	7-16 wk
Tennis	1 (case report) ²	3 mo (until asymptomatic)
Tennis	1 (case report) ⁵	6 wk
Tennis	1 (case report) ⁸	6 wk

amplified when the hand grasps a tool (eg, golf club, tennis racquet, bat).¹ In the case series reviewed, 4 of 7 athletes reported a recent grip change prior to onset of symptoms.¹ Other tennis athletes also reported a change in grip or learning a new grip.^{2,5,8} The rower⁶ and softball athletes,⁴ as well as the majority of the tennis athletes, described an increase in intensity in practicing their sport.

Return to play is an important factor for athletes. In the case reports and case series reviewed, full return to play ranged from 2 to 4 months (7-16 weeks) (Table 1). This was much longer than the 4 to 6 weeks previously reported for metacarpal stress fractures.⁷ That longer time frame was consistent with our golfer, who did not achieve a full return to sport until 4 months.

Given the longer duration for return to play, appropriate guidance is needed when counseling grip athletes with metacarpal stress injuries. Bony stress injuries should be kept on our differential, especially when evaluating the grip athlete with hand pain. Magnetic resonance imaging is the gold standard if the diagnosis is in question. Grip change and increase in intensity of sport occurred in this patient as well as the reviewed cases. These features should be considered when approaching grip athletes with hand pain.

REFERENCES

- Balius R, Pedret C, Estruch A, Hernández G, Ruiz-Cotorro A, Mota J. Stress fractures of the metacarpal bones in adolescent tennis players: a case series. *Am J Sports Med*. 2010;38:1215-1220.

2. Bespalchuk A, Okada K, Nishida J, Takahashi S, Shimada Y, Itoi E. Stress fracture of the second metacarpal bone. *Skeletal Radiol.* 2004;33:537-540.
3. Fredericson M, Bergman AG, Hoffman KL, Dillingham MS. Tibial stress reaction in runners: correlation of clinical symptoms and scintigraphy with a new magnetic resonance imaging grading system. *Am J Sports Med.* 1995;23:472-481.
4. Jowett AD, Brukner PD. Fifth metacarpal stress fracture in a female softball pitcher. *Clin J Sport Med.* 1997;7:220-221.
5. Muramatsu K, Kuriyama R. Stress fracture at the base of second metacarpal in a soft tennis player. *Clin J Sport Med.* 2005;15:279-280.
6. Parsons EM, Goldblatt JP, Richmond JC. Metacarpal stress fracture in an intercollegiate rower. *Am J Sports Med.* 2005;33:293-294.
7. Singletary S, Freeland AE, Jarrett CA. Metacarpal fractures in athletes: rehabilitation, treatment, and safe early return to play. *J Hand Ther.* 2003;16:171-179.
8. Waninger KN, Lombardo JA. Stress fracture of index metacarpal in an adolescent tennis player. *Clin J Sport Med.* 1995;5:63-66.

For reprints and permission queries, please visit SAGE's Web site at <http://www.sagepub.com/journalsPermissions.nav>.