

Scaphoid Fractures



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KEYWORDS

• Scaphoid fractures • Operative fixation • Snuffbox tenderness

KEY POINTS

- A high index of suspicion for scaphoid fracture is required in athletes with a “wrist sprain.”
- Patients with snuffbox tenderness and/or pain with thumb axial compression should be treated for scaphoid fracture until proved otherwise by serial radiographs or advanced imaging.
- Despite the high union rate with nonoperative treatment of nondisplaced scaphoid fractures, there has been a trend toward operative management to reduce the time required for immobilization and return to sport. This approach, however, may be associated with a significantly higher complication rate.

INTRODUCTION

Scaphoid fractures account for two-thirds of all carpal fractures,¹ with the highest incidence in young men in their third decade (**Boxes 1** and **2**).^{2,3} The incidence of scaphoid fracture is estimated to be 8 per 100,000 women and 38 per 100,000 men⁴; however, the incidence in college football players may approach 1 in 100.⁵ A recent study by Wolf and colleagues⁶ found a male dominance of only 2:1, a higher ratio of female fractures than previously reported, possibly because of the increased participation of women in sports.

The most common mechanism is fall on an outstretched, pronated, and ulnarly deviated hand, typically with the wrist in greater than 90 degrees of dorsiflexion.^{5,7} Other mechanisms include a direct blow or axial loading with the wrist in neutral flexion-extension. Patients may exhibit minimal swelling and mildly decreased range of motion, increasing the risk of missing an occult fracture. All patients with snuffbox or scaphoid tubercle tenderness or radial wrist pain should be treated as having a scaphoid fracture until proved otherwise (**Fig. 1**) and should be immobilized and have serial radiographs and/or advanced imaging (computed tomography [CT] or MRI).⁷ Pinching of the thumb and index finger and pain with pronation have been

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Box 1**Risk factors for nonunion**

Displacement of more than 1 mm
 Fracture of the proximal pole
 History of osteonecrosis
 Vertical oblique fracture pattern
 Nicotine use
 Delay in diagnosis
 Inadequate immobilization

Data from Refs. ^{8,10,28}

shown to be sensitive provocative maneuvers consistent with scaphoid fracture. Axial compression of the thumb has also been proposed as an additional clinical examination maneuver sensitive for diagnosis of scaphoid fracture.^{8,9}

Unfortunately, acute scaphoid fractures may be incorrectly diagnosed as sprains and treated without adequate radiographs and immobilization (**Fig. 2**).¹⁰ Especially in the athletic population, the desire to play through pain may contribute to delayed diagnosis. Untreated or undertreated scaphoid fractures may develop nonunion, which may occur in 5% to 25% of cases.^{11–13} In addition to the short-term pain, weakness, and disability, scaphoid nonunion results in a predictable pattern of wrist arthritis that, if left untreated, typically requires treatment with salvage operations.^{14,15}

Surgical management may offer athletes the opportunity to return to sport more quickly.¹⁰ Athletes with an in-season nondisplaced scaphoid waist fracture could be expected to achieve 90% to 100% union rates with cast treatment (**Fig. 3**). However, the 9 to 12 weeks of immobilization in combination with resultant loss of strength and rehabilitation would likely jeopardize return to play that season and possibly in the future.¹⁶ The potential benefits of surgery have to be weighed carefully against the increased risks of complications seen with operative treatment.¹⁷

ANATOMY

Scaphoid is derived from the Greek term *skaphe*, meaning boat or skiff.⁸ The scaphoid functions as a mechanical link between the distal and proximal rows of the carpus.

Box 2**Results of scaphoid malunion or nonunion**

Pain
 Altered carpal kinematics
 Diminished range of motion
 Disuse osteopenia
 Decreased grip strength
 Dorsal intercalary segmental instability
 Degenerative changes (scaphoid nonunion advanced collapse)

Data from Refs. ^{5,8,17,32}

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