Injuries to the hand and wrist are commonly encountered in athletes. Decisions regarding the most appropriate treatment, the timing of treatment, and return to play are made while balancing desires to resume athletic activities and sound orthopedic principles. Little recognition in the literature exists regarding the need for a different approach when treating these injuries in elite athletes and the timing to return to play. This study explored the complexities of treating hand and wrist injuries in the elite athlete. Thirty-seven consultant hand surgeons for teams in the National Football League, National Basketball Association, and Major League Baseball completed a brief electronic survey about the management of 10 common hand injuries. Notable variability existed in responses for initial management, return to protected play, and return to unprotected play for all injuries, aside from near consensus agreement (94%) that elite athletes with stable proximal interphalangeal dislocations could immediately return to protected play. Basketball surgeons were less likely to recommend early return to protected play than non-basketball surgeons. Baseball surgeons were more likely to recommend early unprotected play after scaphoid fixation. Football surgeons were more likely to recommend earlier return to protected play after thumb ulnar collateral ligament injuries, whereas basketball surgeons were less likely to recommend earlier return to protected play.

This study demonstrated wide variability in how consultant hand surgeons approach the treatment of hand and wrist injuries. The findings emphasize the need to individually tailor treatment decisions to the patient’s desires and demands, particularly in high-performance athletes.
Injuries to the hand and wrist are commonly encountered in athletes. After arriving at a diagnosis, the treating physician must address the many considerations that make treating an athlete different than caring for other patients. Decisions regarding the most appropriate treatment, the timing of treatment, and circumstances surrounding return to play are made while balancing desires to resume athletic activities and sound orthopedic principles. The same complexities that differentiate the treatment of athletes from nonathletes are what distinguish the management of injuries in elite athletes. High-performance athletes are likely to have a different perspective than casual athletes, placing greater importance on return to play given the implications on their livelihood. Given these differences, expectations for treatment outcomes in elite athletes are likely to be higher than those of casual athletes. Although the literature is replete with case series and expert opinions regarding the management of hand and wrist injuries in athletes, little recognition exists regarding the need for a different approach when treating injuries in elite athletes and timing to return to play.

To further explore the complexities of treating hand and wrist injuries in elite athletes, the authors conducted a survey of consultant hand surgeons for professional football, basketball, and baseball teams in the United States. Physicians were asked about their practice of timing of surgery and return to play (both protected and unprotected) for 10 common hand injuries. The authors hypothesized opinions would vary widely regarding the treatment of hand and wrist injuries in elite athletes, with notable differences based on experience with athletes from different sports.

Materials and Methods
To generate the study cohort, team physicians for every team in the National Football League, National Basketball Association, and Major League Baseball were contacted and asked for the contact information for their consultant hand surgeon. Those 78 hand surgeons were requested to complete a brief electronic survey with questions about the management of metacarpal shaft fractures, scaphoid fractures, pisiform fractures, hamate hook fractures, thumb ulnar collateral ligament injuries, and dislocations of the proximal interphalangeal joint. This survey included questions about indications for surgery, return to protected play, and return for unprotected play (Table). The survey items were derived from the senior author’s (M.G.C.) experience in treating professional athletes, including primary coverage of a National Basketball Association team. Invitations to complete the anonymous survey were distributed via e-mail using third-party software (SurveyMonkey, Palo Alto, California). One reminder to complete the survey was sent after the initial invitation. The research protocol was approved by the authors’ institutional review board prior to survey administration.

Crosstab calculations and chi-square analysis were performed using SPSS version 19.0 software (IBM, Armonk, New York). Responses were compared by sport treated by the surgeon (baseball vs no baseball; football vs no football; basketball vs no basketball), by the number of sports treated (1 sport or more than 1 sport), and number of professional athletes treated (more or less than 12 per year). An a priori sample size calculation was not performed because a convenience sample of a limited cohort was planned.

Results
Thirty-seven consultant hand surgeons completed the survey, all of whom were affiliated with at least 1 professional sports team. Respondents were asked which sport they were currently affiliated with and were allowed to list more than 1 sport. Fifteen respondents reported that they treated elite athletes in only 1 sport and 22 reported that they treated elite athletes from more than 1 sport. The most commonly treated sports were baseball (n=22) and football (n=22), followed by basketball (n=19) and hockey (n=12). Eighteen of the respondents treated more than 12 elite athletes in 1 year, whereas 19 treated less than 12 elite athletes in 1 year.

Metacarpal Fractures
Protected Play. Slightly more than half (n=21; 56.8%) of the 37 respondents allow elite athletes with nondisplaced metacarpal fractures to return to protected play at 3 to 4 weeks after injury, whereas 14 (37.8%) allow immediate return to protected play. Surgeons who treated basketball players were less likely to recommend early return to protected play than non-basketball surgeons (P=.047).

Unprotected Play. Most respondents (n=27; 73%) waited until 4 to 8 weeks after injury for unprotected play to resume.

Scaphoid Fractures
Protected Play. Slightly more than half of the 37 respondents (n=19; 51.4%) allow elite athletes to return to protected play 4 to 6 weeks after treatment of a nondisplaced scaphoid fracture. Twelve surgeons (32.4%) allow elite athletes to return to protected play immediately.

Unprotected Play. Opinions regarding return to unprotected play were more variable: 9 (24.3%) allow return to unprotected play after 4 to 6 weeks, 18 (48.6%) after 6 to 12 weeks, and 10 (27%) wait more than 12 weeks. Surgeons who treated baseball players were more likely than non-baseball surgeons to recommend their patients to unprotected play earlier after treatment of a nondisplaced a scaphoid fracture (P=.005). Surgeons who treated athletes from more than 1 sport were also more aggressive in recommending earlier unprotected play after treatment of a nondisplaced a scaphoid fracture (P=.042).

Pisiform Fractures
Treatment Decision. For elite athletes with pisiform fractures, 11 (29.7%) surgeons allow immediate return to play,
Table

Return to Play and Treatment Recommendations According to Hand and Wrist Injury

<table>
<thead>
<tr>
<th>Injury</th>
<th>No. (%) of Surgeons</th>
<th>Protected Play</th>
<th>Unprotected Play</th>
<th>Treatment Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nondisplaced metacarpal shaft fracture</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediately</td>
<td>14 (37.8)</td>
<td>0 (0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>When healed, 3-4 wk</td>
<td>21 (56.8)</td>
<td>5 (17.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-8 wk after injury</td>
<td>2 (5.4)</td>
<td>27 (73.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;8 wk after injury</td>
<td>0 (0)</td>
<td>5 (17.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nondisplaced scaphoid fracture</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediately</td>
<td>12 (32.4)</td>
<td>0 (0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>When healed, 4-6 wk</td>
<td>19 (51.4)</td>
<td>9 (24.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-12 wk after injury</td>
<td>6 (16.0)</td>
<td>18 (48.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;12 wk after injury</td>
<td>0 (0)</td>
<td>10 (27.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nondisplaced pisiform fracture</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediately</td>
<td>11 (29.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediate excision</td>
<td>7 (18.9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 wk with splint</td>
<td>8 (21.6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excision after 4 wk if not healed</td>
<td>3 (8.1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excision after 8 wk if not healed</td>
<td>8 (21.6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nondisplaced hamate hook fracture</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediately</td>
<td>11 (30.6)</td>
<td>1 (3.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 wk after excision (when skin healed)</td>
<td>19 (52.8)</td>
<td>15 (40.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 wk after excision</td>
<td>6 (16.7)</td>
<td>20 (54.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 mo after excision</td>
<td>0 (0)</td>
<td>1 (3.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thumb ulnar collateral ligament tear</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No surgery</td>
<td>1 (2.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediate repair</td>
<td>14 (27.8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repair at end of season (if ≤6 wk)</td>
<td>12 (32.4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repair at end of season (if ≤3 mo)</td>
<td>3 (8.1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repair at end of season (≥6 mo)</td>
<td>7 (18.9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return to play</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediately</td>
<td>5 (13.9)</td>
<td>0 (0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 wk</td>
<td>20 (55.5)</td>
<td>0 (0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 wk</td>
<td>10 (27.8)</td>
<td>12 (33.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 mo</td>
<td>1 (2.8)</td>
<td>23 (63.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 mo</td>
<td>0 (0)</td>
<td>1 (2.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stable PIP dislocation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediately</td>
<td>34 (94.4)</td>
<td>9 (24.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 wk</td>
<td>2 (5.6)</td>
<td>11 (29.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-8 wk</td>
<td>0 (0)</td>
<td>14 (37.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;3 mo</td>
<td>0 (0)</td>
<td>3 (8.0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Abbreviation: PIP, proximal interphalangeal.
7 (18.9%) recommend immediate excision, 8 (21.6%) recommend splinting for 4 weeks followed by return to sport, 3 (8.1%) recommend excision after 4 weeks if not healed, and 8 (21.6%) recommend excision after 8 weeks if not healed.

Surgeons who treat more than 12 elite athletes in 1 year are more likely to recommend immediate treatment (either immediate return to play or immediate excision), whereas surgeons who treat less than 12 elite athletes in 1 year are more likely to explore delayed treatment options (P = .043).

Hamate Hook Fractures

Protected Play. Following excision of hamate hook fractures, 11 (30.6%) of 36 surgeons allow immediate return to protected play, 19 (52.8%) allow return to protected play after 2 weeks, and 6 (16.7%) of surgeons allow return to unprotected play in 6 weeks.

Unprotected Play. More than half of the 37 surgeons (n = 20; 54.1%) allow return to unprotected play at 2 weeks, 15 (40.5%) allow return to unprotected play at 4 weeks, and 1 (2.7%) allows immediate return to unprotected play.

Thumb Ulnar Collateral Ligament Tears

Treatment Decision. For an elite athlete with a complete thumb ulnar collateral ligament tear, 14 (37.8%) of the 37 surgeons recommended immediate repair, 12 (32.4%) recommended repair at the end of the season (if within 6 weeks), 3 (8.1%) recommended repair at the end of the season (if within 3 months), 7 (18.9%) recommended repair at the end of the season (if beyond 3 months) from injury, and 1 (2.7%) surgeon recommended nonoperative treatment.

Protected Play. For return to protected play after thumb ulnar collateral ligament injury, 5 (13.9%) of 36 surgeons recommended immediate return, 20 (55.6%) recommended waiting 2 weeks, 10 (27.8%) recommended waiting 6 weeks, and 1 (2.8%) recommended waiting 3 months. Surgeons who treat football players are more likely to recommend earlier return to protected play than non-football surgeons (P = .023), whereas surgeons who treat basketball players are less likely to recommend earlier return to protected play than non-basketball surgeons (P = .021).

Unprotected Play. For return to unprotected play, most of the 36 surgeons (n = 23; 63.9%) recommended waiting 3 months.

Strong Proximal Interphalangeal Joint Dislocation

Protected Play. Almost all 36 (n = 34; 94.4%) surgeons recommended immediate return to protected play for elite athletes with stable proximal interphalangeal dislocations, whereas 2 (5.6%) surgeons recommended waiting 4 weeks.

Unprotected Play. More than one-quarter (n = 11; 29.7%) of the 37 surgeons recommended returning to unprotected play after 4 weeks, 14 (37.8%) recommended waiting 4 to 8 weeks, and 3 (8.1%) surgeons recommended a period of more than 3 months before return to unprotected play.

Discussion

Increasing awareness of the influence of patient expectations on treatment outcomes indicates that surgeons need to be more cognizant of what patients desire and expect from treatment. This is particularly true when treating athletes who not only participate in sports for recreational or fitness pursuits but also rely on their athletic abilities for their livelihood. Recognition of elite athletes as a distinct patient population is important in allowing surgeons and patients to participate in shared decision making that balances the desires of immediate return to play with long-term sequelae. In the current study, the authors demonstrated wide variability in how consultant hand surgeons approach the treatment of hand and wrist injuries. The individual experiences of the respondents have shaped their approach to management, as the current results indicate that those who care for athletes of different sports occasionally have significantly different thresholds for return to protected and unprotected play. Treatment is tailored to the demands of the individual athletes and their sports, as evidenced by instances of more conservative management among surgeons who treat basketball players, whose sport requires distinct dexterity with a short interval between games.

Although this survey provides a glimpse into the decision making of consultant hand surgeons, it is beyond the scope of this investigation to indicate whether these treatment recommendations predict outcomes, and this research needs to be done. Surgeons must carefully counsel patients about the risks and benefits of each nuanced aspect of treatment and, in situations where athletic performance has deep-seated career or financial implications, informed and shared decision making is critical to ensure satisfactory outcomes.

As the authors demonstrated, a major challenge in treating elite athletes is determining the appropriate time frame for return to play. The benefits of early return must be weighed against the consequences of potential complications. Although all patients with fractures who return to play too early may experience delayed healing or nonunion, the difficulty in treating these sequelae vary depending on the type of fracture. Metacarpal shaft nonunions or malunions can be readily treated with internal fixation and bone grafting (if needed), whereas pisiform nonunions can be treated with excision. However, premature return to play after scaphoid fracture can create unnecessarily challenging treatment scenarios because an acute fracture that is easily treatable may develop into a difficult-to-treat nonunion. Because the latter may have substantial negative short- and long-term effects, return to play after scaphoid fractures should be approached...
with more caution. For example, the authors prefer to confirm at least 50% healing with computed tomography before allowing return to play. Conversely, for proximal interphalangeal dislocations, the risk of a redislocation is small, especially with buddy taping, and the likelihood of being able to reduce a redislocated joint is high. Surgeons have a low threshold to allow immediate return to play for this injury.

The main limitations of the current study are centered on the survey tool. The injuries included in the survey are those that were felt to be commonly encountered, but with at least mild to moderate controversy regarding treatment. The survey was not designed to assess actual treatment decisions, but rather to demonstrate variability in decision making among consultant hand surgeons. A formalized validation process was not undertaken, but the survey was internally piloted among the hand surgery faculty of the authors’ academic institution. The response rate of the study cohort was 47% (37 of 78 consultant hand surgeons), which is less than desired but acceptable when compared with other surveys of professional surgeon groups. It is possible that the results may have been different if a larger proportion of the study cohort had completed the survey. Despite these limitations, the authors believe that the study has demonstrated the amount of variability in the decision making of consultant hand surgeons.

**Conclusion**

The findings emphasize the need to individually tailor treatment decisions to patients’ desires and demands, particularly in high-performance athletes. This survey has spurred the formation of a group of consultant hand surgeons who are now collaborating for multicenter prospective studies of hand and wrist injuries in elite athletes.

**References**