Case Report

Return to Play After Nonoperative Treatment of Type III Acromioclavicular Injury in a Professional Baseball Player

Matthew Bessette1*, Lonnie Soloff2 and Mark Schickendantz1

1Department of Orthopaedic Surgery, Cleveland Clinic Sports Health Center, USA
2Cleveland Indians, Major League Baseball, Cleveland, USA

Abstract

Acromioclavicular injuries are commonly encountered in young, athletic populations. While many are minor injuries that heal quickly and uneventfully, higher-grade injuries may be functionally debilitating or have lingering symptoms and in certain cases necessitate operative treatment. Baseball players place particularly high demands on their throwing shoulders. While acromioclavicular injuries are less common in this population, treatment can be difficult because of the associated stress of throwing. We present a case report of a Major League Baseball catcher who sustained a Type III acromioclavicular injury of his throwing shoulder. Despite a minimally displaced pisiform fracture sustained after being hit by a pitch during rehabilitation, he was able to return to play in the same season with conservative treatment of both injuries.

INTRODUCTION

The acromioclavicular (AC) joint is the diarthroidal articulation between the lateral clavicle and the medial acromion. It serves as an important stabilizing structure between scapula and the clavicle. Anterior to posterior stability is conferred from the AC capsule and ligaments, while superior to inferior stability is provided by the trapezoid and conoid coracoclavicular (CC) ligaments [1]. Acromioclavicular joint injuries are common in young, athletic populations. The incidence tends to rise along with the level of competition and the amount of contact an athlete is typically exposed to in a certain sport [2].

Injuries are commonly described according to the classification system proposed by Rockwood, et al. [3]. Type I and type II injuries involve partial injuries to the AC and CC ligament complex, and are the most common type of injury encountered [1]. Type III injuries are more severe, and involve complete injuries to both the AC and CC ligaments. Higher level injuries (types IV-VI) involve more significant displacement and further soft-tissue injury, and are less common. While type I and II injuries typically result in less than two weeks of time out from competition, athletes with higher grade injuries can take several months to return to activities [2].

Controversy exists regarding the optimal treatment algorithm for dealing with Type III AC separations [4,5]. While the injury is common in athletes, it has not been extensively studied in throwing athletes. One case report exists describing nonoperative management of a Type III acromioclavicular separation in the throwing shoulder of a collegiate pitcher [6]. We report a case of a professional baseball catcher who sustained a type III acromioclavicular separation and was able to rehabilitate his injury without surgery and return to play during the same season.

CASE PRESENTATION

We report the case of a 29-year-old baseball catcher who sustained a type III acromioclavicular separation to his throwing shoulder and returned to play the same season with nonoperative treatment. At the time of the injury, the patient was an established starting catcher on a Major League Baseball team who was a right-hand dominant thrower and batter. His injury occurred during a game after a fall onto his right shoulder while running to first base. His diagnosis was confirmed as an isolated type III AC separation after both radiographs (Figure 1) and magnetic resonance imaging (MRI) (Figure 2) were obtained.

Initial treatment consisted of an Ultrasling II (Donjoy, Vista, CA), cryotherapy, and a tapered course of oral methyl prednisolone. A discussion regarding treatment options was entertained, and the decision to proceed with non-operative treatment was made as it gave the player the best chance of returning to play that season (Table 1). Risks about persistent
symptoms, especially during throwing, were weighed against the increased time for healing and potential complications associated with surgery. A coordinated plan with the entire team medical staff was made to utilize a multimodal approach to accelerated recovery. On post-injury day (PID) 2, Micro Current therapy \[7\] was initiated as an analgesic and to modulate healing (30 Hz/500 µamps, 20 minutes per day). Passive internal and external shoulder motion as well as pendulum exercises were also introduced, and the patient began aquatherapy (Hydroworx, Middletown, PA). Lower extremity conditioning was done on a stationary bike and water walking. On PID 5, the patient was comfortable enough to discontinue the sling, and the following day was able to initiate treadmill walking.

By PID 8, passive elevation to 110° was tolerated with minimal pain, and active motion at the shoulder as well as isometric shoulder, biceps, and triceps exercises were commenced. Just over two weeks after the injury, there was full painless passive shoulder motion and the strengthening phase of recovery was commenced with table-height scapular push-ups (2 sets of 15 repetitions) and closed kinetic chain kneeling walk-overs. Internal and external rotation resistance band (Theraband, Akron, OH) exercises were also started (2 x 12).

Re-examination on PID 18 revealed only mild tenderness to palpation at the AC joint. The deformity was not accentuated with cross-body adduction, and was stable to anterior and posterior displacement. Biomechanical Ankle Platform System (BAPS) board push-ups plus were started and rhythmic stabilization exercises of the shoulder were completed. Manual resistance exercises were added for wrist, forearm, and deltoid strengthening. Bottom-handed batting off a tee with the left hand and catching from a pitching machine were begun.

By PID 27, there was painless active range of motion and two-handed swings with a bat were well tolerated. Batting from a tee two-handed was started at 40-50% intensity. This was increased over the next few days to 75% intensity. On PID 32, simulated hitting was begun with front flips. Gentle throwing was also started at a 20-foot distance, and an interval throwing program was commenced the following days starting at 60 feet. This was increased gradually to 150 feet by PID 43.

On PID 34, BAPS board push-up plus as well as normal push-ups were started. Shortly thereafter, the patient began taking batting practice in a batting cage. Soreness was noted with the first few swings, though this disappeared after approximately 5 swings. Laser therapy (Class IV, 8 Joules) \[8\] along with deep oscillation therapy (Hivamat, Physiomed North America) was started for pain modulation. By day 43, batting practice was stared on the field.

On PID 47, the patient participated in a Minor League game as a designated hitter, taking three at-bats. By PID 52, the patient was cleared medically from his injury and participated in 5 innings of a Minor League game as a catcher and batter, and was able to catch for an whole 9 innings by PID 58.

On PID 59 while still on a Minor League rehabilitation assignment, the patient was hit by an errant pitch, which resulted in a non-displaced pisiform fracture (Figure 3). He was initially administered 10mg of intramuscular dexamethasone. After the diagnosis was confirmed, the patient was offered a course of immobilization in a cast or symptomatic treatment and return to play. He opted for symptomatic treatment despite the increased risk of a nonunion without casting. He was treated initially with a bone stimulator and an Exos splint (DJO Global, Vista, CA). A throwing program was started on PID 64, or 5 days after his pisiform fracture. By PID 75, he was able to take batting practice.
on the field in a wrist sleeve (Benik Corp, Silverdale, WA) and supportive taping, and on PID 77 he was again medically cleared to return to full play. On that day, 18 days after his pisiform fracture, he was able to take two MLB at-bats during the last regular season game of the year. During the first at-bad, he recorded a two-run home run. His team went on to make the playoffs that season, where the patient was able to serve in the capacity as a catcher and designated hitter with no ill-effects from his AC injury.

**DISCUSSION**

While acromioclavicular separations are commonly encountered injuries, the optimal treatment for type III injuries has yet to be elucidated. Traditionally, non-operative treatment was favored. Concerns regarding persistent pain and instability, however, have prompted interest in more aggressive operative treatment, [1] especially in patient populations who are thought to put increased stress on the shoulders due to overhead or heavy lifting activities [2]. A recent systematic review by Beitzel, et al., [5] found significant gaps in the available literature regarding optimal treatment strategies and surgical techniques. Study populations demonstrated similar clinical outcomes whether patients were treated operatively or non-operatively, but return to work and return to sport was approximately half as long for non-operative cohorts. Cosmetic results are improved for patients undergoing surgery, though complications are higher [9]. A recent randomized controlled study by the Canadian Orthopaedic Trauma Society found faster return to work and faster improvement in patient reported outcomes when high-grade acromioclavicular injuries were treated with a sling for 4 weeks followed by physiotherapy rather than a hook plate, though radiographic outcomes were superior in the operative cohort [10].

Contemporary conservative treatment generally involves the temporary use of a sling for pain control and to limit stress across the AC joint followed by passive restoration of motion and finally strengthening and functional exercises. Available treatment algorithms lack strong evidence-based recommendations for any specific phases or modalities of treatment [11]. Physical therapy, when pain permits, is generally focused on scapular strengthening and shoulder stabilization exercises. Scapular dyskinesis has been found to occur in most patients treated conservatively for chronic type III AC separations [12]. The high incidence and generally favorable course of AC separations has been well-documented in contact sports [13]. AC separations from baseball, however, are relatively rare in comparison to contact sports like football, wrestling, and ice hockey [14]. In a study of AC separations sustained in the National Football League, Lynch, et al.[15], found that quarterbacks missed more games in comparison to other positions. This is possibly due to the unique throwing demands that quarterbacks place on their shoulders and the magnified consequences that even minor injuries can have on the pitcher's performance. In a study of injuries to Major League Baseball catchers resulting in placement on the disabled list (DL) by Kilcoyne, et al.[17], the average time spent on the DL was nearly 51 days, and was higher in non-collision injuries (53 days) when compared to collision injuries (39 days). Shoulder injuries accounted for 23% of all injuries, but resulted in more days on the DL in comparison to lower extremity injuries. One AC injury was noted in the study period between 2001 and 2010, and resulted in 17 missed days. In 2015, Watson and Wyland [6] reported a case of conservative treatment for a type III AC separation in a collegiate baseball pitcher. Treatment consisted of a figure-of-8 brace and a sling, and scapular stabilization therapy was initiated at six weeks post-injury. Pain-free pitching was possible at twelve weeks post-injury, and he participated in off-season competition at four months.

In contrast to this previous study, our case report involves more rapid progression from immobilization to motion and eventual strengthening. In contrast to other studies [6,10] sling usage was limited to a short time frame as needed, not a pre-determined course. Modalities such as Microcurrent were utilized to augment the traditional methods of pain control including cryotherapy and immobilization and to enhance the healing of local soft tissues [18]. This has not been specifically studied for acromioclavicular injuries. Hydrotherapy was used to assist in gaining passive motion. Near-daily contact with team medical staff members allowed for rapid progression of activities as symptoms allowed, rather than waiting for traditional clinical follow-up time points. Modified conditioning was employed concurrently to treatment of the injury for both the lower body and opposite upper extremity to combat deconditioning during recovery. Our study is unique in that it describes a full return to Major League play in a professional catcher within 77 days of his initial injury despite a pisiform fracture sustained during his late rehabilitation. It describes various modalities used in conjunction with frequent contact with the team medical staff to allow for rapid recovery. Nonsurgical treatment was chosen as it would allow a faster return to play while not clearly effecting overall outcomes. While little evidence exists for the specific treatments employed, an aggressive multimodal approach was utilized. The patient’s status as a MLB catcher allowed for close clinical...
follow-up throughout the recovery, aiding the rapid progression through traditional treatment phase. The patient was initially medically cleared from his injury and started a Minor League rehabilitation assignment on PID 52. Our report details the specific and concentrated rehabilitation that allowed this rapid return to high-level competition in a relatively short span of time.

CONCLUSION

Acromioclavicular injuries are common, but the incidence in baseball is lower when compared to other sports. Baseball players, whether they are pitchers or position players, place unique demands on their throwing shoulders that make them particularly vulnerable to the effects of injuries and treatments. We report the successful non-operative rehabilitation of a starting MLB catcher back to full competition during the same season after a type III AC separation of the throwing shoulder. Our treatment approach may serve as guidance for physicians and athletes weighing treatment options for this infrequently encountered baseball injury.

REFERENCES