Grade V acromioclavicular joint separation in a 57-year-old mountain biker

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Patients rarely present to a chiropractic office setting during the acute stage of a high-grade (i.e. Rockwood types IV-VI) separation of the acromioclavicular (AC) joint. Moreover, such cases are non-existent in the peer-reviewed chiropractic literature. Some controversy exists over the optimal (surgical vs. non-surgical) treatment of severe AC joint injuries. Published reports of nonoperative management for grade V injuries of the AC joint are also scarce. This case review highlights the plain film imaging and conservative management of a 57-year-old patient diagnosed with an acute Rockwood type V AC joint separation. Radiographs with nine years of follow-up are presented.

(JCCA. 2017;61(1):68-71)

KEY WORDS: acromioclavicular joint, sprain, dislocation, chiropractic

Les patients se présentent rarement à une clinique de chiropratique pendant la phase aiguë d'une séparation de haut grade (c.-à-d., types IV à VI de Rockwood) de l'articulation acromio-claviculaire(AC). En outre, ces cas n'existent pas dans la littérature sur la chiropratique examinée par les pairs. Le traitement optimal (chirurgical vs non chirurgical) des lésions graves de l'articulation AC ne fait pas l'unanimité. Les rapports publiés sur la prise en charge non chirurgicale des lésions de grade V de l'articulation AC sont également *peu abondants. Cet examen de cas met en lumière l'imagerie par radiographie et la prise en charge conservatrice d'un patient de 57 ans souffrant de séparation aiguë de l'articulation AC de type V de Rockwood. Les radiographies avec neuf ans de suivi sont présentées.*

(JCCA. 2017;61(1):68-71)

MOTS CLÉS : articulation acromio-claviculaire, entorse, dislocation, chiropratique

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The patient has given written consent to have his personal health information, including radiographs, published.
The authors have no competing interests to declare. There was no financial support received in preparation of this manuscript.

Case Presentation

A 57-year-old male presented with acute pain, swelling, and noticeable "clunking" in his left shoulder two days after crashing from his mountain bike while cross-country trail riding. The injury occurred when he landed awkwardly from a jump and somersaulted over the handlebars of his bike, jamming his left shoulder hard into the ground. He felt immediate excruciating pain, but did not seek medical attention. He applied ice to his shoulder multiple times at home over the next two days before presenting to the chiropractic clinic. The pain severity at the time of presentation was graded as a nine out of a possible 10. On examination, there was notable swelling and deformity of the left acromioclavicular (AC) joint with elevation of the left clavicle. Manual palpation revealed extreme laxity along with complete separation of the distal clavicle from the acromion process. Upper limb neurological and vascular examination was normal. Left shoulder joint radiographs, including an anteroposterior view of the left AC joint, revealed widening of the AC joint and an increased coracoclavicular (CC) space (measuring 32 mm), along with marked elevation of the clavicle (Figure 1). The patient was diagnosed with an acute grade V separation of the left AC joint.

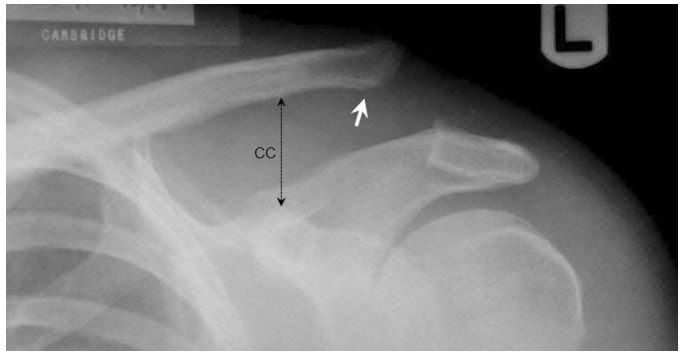

Figure 1.
Initial anteroposterior radiograph reveals superior elevation of the left clavicle (arrow) and marked widening of both the AC joint space (22 mm) and CC (coracoclavicular) space (32 mm).

According to the Rockwood classification[1], there are six types of AC joint injuries (Table 1). Types I and II are typically treated conservatively while types IV to VI are often treated surgically.[1-3] The optimal (i.e. surgical versus non-surgical) management of Rockwood types III and V AC injuries nevertheless remains controversial.[2-5] For instance several studies have shown equally good clinical outcomes in patients treated non-surgically, versus surgically, for these types of AC joint dislocations.[2,4-6] However, radiographic and/or cosmetic outcomes tend to be better in such patients with surgical intervention.[2-4,7] Given the potential for risks and complications with surgery[2-7], some authors continue to advocate for a 'conservative-first' approach to managing severe AC joint injuries[8]. For the clinician, patients with these types of injuries are advised to have both surgical and non-surgical consultations. In each individual case one has to consider the benefits and risks associated with surgical and non-surgical conservative management. Presently the outcomes with both plans of management are highly variable and require further study.

The patient in this case was referred to his family physician to evaluate the need for orthopedic surgical consultation. Based on the patient's preference as well as the absence of 'red flags', such as neurovascular or pulmonary compromise, non-surgical conservative therapy was recommended. The patient subsequently returned to the chiropractor and was treated as follows: ultrasound therapy (3.0 MHz, 1.0 W/cm^2, 50% pulse, eight minutes) was

Table 1.
Rockwood classification of AC joint injuries[1]

Type	Description
I	AC ligament sprain; AC joint intact; CC ligaments intact; Deltoid, trapezius intact
II	AC joint disruption; Slight vertical separation of AC joint; CC ligament sprain; CC distance is widened; Deltoid, trapezius intact
III	AC ligament disruption; AC joint dislocated; CC ligaments torn; CC distance is 25-100% > than normal side; Deltoid, trapezius may be detached
IV	AC ligament disruption; AC joint dislocated; Clavicle displaced posteriorly into trapezius; CC ligaments completely torn; Deltoid, trapezius detached from distal clavicle
V	AC ligament disruption; AC joint dislocated; CC ligaments completely torn; CC distance is 100-300% > than normal side; Deltoid, trapezius detached from distal half of clavicle
VI	AC ligament disruption; AC joint dislocated; CC ligaments completely torn; Clavicle in subcoracoid position; Deltoid, trapezius detached from distal half of clavicle

Legend: AC = acromioclavicular, CC = coracoclavicular

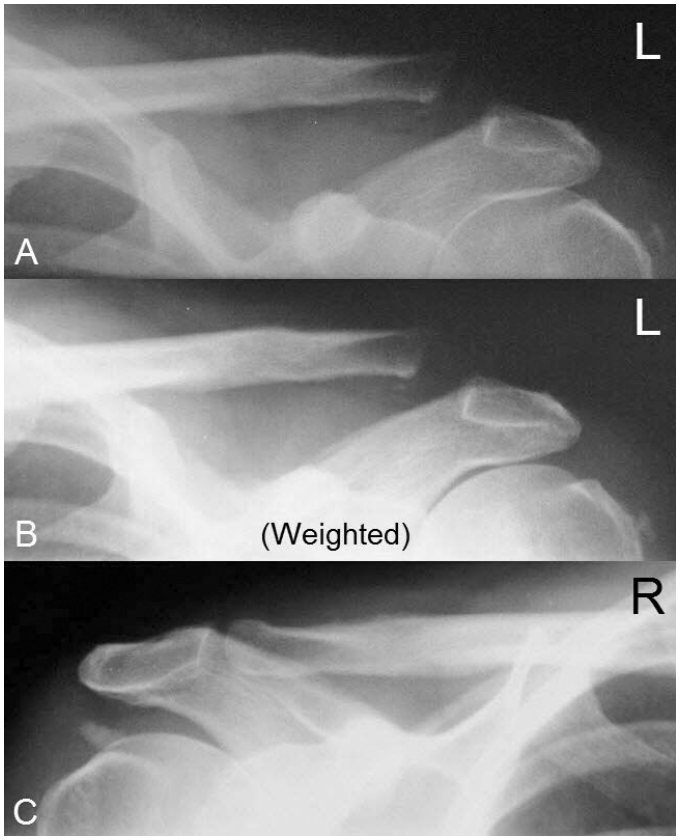

Figure 2.
Follow-up radiographs of the left shoulder without (A) and with (B) weights, obtained nine years later at age 66 years, reveal persistent widening of the AC joint, but no appreciable increase with weights. A radiograph of the normal right side (C) is provided for comparison.

applied to the left AC joint, home-based rotator cuff isometric and Thera-Band™ isotonic strengthening exercises were prescribed (i.e. internal and external shoulder rotation and triceps extensions, performed to tolerance; three sets of 10 reps, 2-3 times/day), home ice therapy was recommended (i.e. 15-20 minutes, every 1-2 hours for the first 2-3 days, then as needed), and the patient was advised to purchase an AC joint shoulder splint (to be worn 24 hours/day, seven days/week, except for showering and icing). After 12 visits (over eight weeks), the patient's left clavicle was still superiorly displaced but his shoulder range of motion was normal and his AC joint was pain-free. With the inherent limitations of a single case study, it is unknown if these clinical outcomes were as a result of the treatment or the natural course of the injury.

Radiographs taken nine years later (at age 66) revealed that there was still moderate elevation of the left clavicle and widening of the AC and CC joints (Figure 2). Despite these findings, the shoulder range of motion remained full and pain-free and the patient had continued to participate in competitive cross-country trail riding with no limitations. These results are consistent with those found in a recent randomized controlled trial comparing operative versus nonoperative treatment of grades III and V AC joint dislocations.[4] Although patients treated nonoperatively ended up with more prominent or unstable and radiographically wider AC joints, clinical outcomes were equally good between the operative and nonoperative groups at long-term (18- to 20-year) follow-up.[4] Good functional outcomes in non-surgically (versus surgically) treated patients with severe AC joint injuries have also been shown by others.[6,7] As in the current case this suggests that in the absence of clinical 'red flags', nonoperative treatment may be a viable option in managing some patients with Rockwood type V AC joint dislocations. However, larger studies are still needed.[4] For more information and additional examples of AC joint injuries, visit Radiopaedia.org.[9]

Key Messages

- Based on the Rockwood classification, AC joint injuries are divided into six categories
- Rockwood types I and II typically respond well to conservative therapy, whereas surgery is usually recommended for types IV to VI
- Patients treated non-surgically for types III and V AC joint separations may achieve a good clinical outcome despite a poorer radiographic and/or cosmetic outcome
- Reports of nonoperative management with long-term follow-up for type V injuries of the AC joint nevertheless remain scarce
- Patients with grades III and V separations are advised to have both surgical and non-surgical consultations; however at present the outcomes with both plans of management are highly variable and need further study

References

1. Rockwood CA, Williams GR, Young DC. Acromioclavicular injuries. In: Rockwood CA, Green DP, Bucholz RW, Heckman JD, editors. Fractures in Adults. 4th ed. Vol I. Philadelphia, PA: Lippincott-Raven; 1996. pp. 1341-1413.
2. Smith TO, Chester R, Pearse EO, Hing CB. Operative versus non-operative management following Rockwood grade III acromioclavicular separation: a meta-analysis of the current evidence base. J Orthop Traumatol. 2011;12(1):19-27.
3. Korsten K, Gunning AC, Leenan LPH. Operative or conservative treatment in patients with Rockwood type III acromioclavicular dislocation: a systematic review and update of current literature. Int Orthop. 2014;38(4):831-838.
4. Joukainen A, Kröger H, Niemitukia L, Mäkelä EA, Väätäinen U. Results of operative and nonoperative treatment of Rockwood types III and V acromioclavicular joint dislocation: a prospective, randomized trial with an 18- to 20-year follow-up. Orthop J Sports Med. 2014;2(12):2325967114560130.
5. Tamaoki MJ, Belloti JC, Lenza M, Matsumoto MH, Gomes Dos Santos JB, Faloppa F. Surgical versus conservative interventions for treating acromioclavicular dislocation of the shoulder in adults. Cochrane Database Syst Rev. 2010;(8):CD007429.
6. Larsen E, Bjerg-Nielsen A, Christensen P. Conservative or surgical treatment of acromioclavicular dislocation. A prospective, controlled, randomized study. J Bone Joint Surg Am. 1986;68(4):552-555.
7. Bannister GC, Wallace WA, Stableforth PG, Hutson MA. The management of acute acromioclavicular dislocation. A randomised prospective controlled trial. J Bone Joint Surg Br. 1989;71(5):848-850.
8. Rasmont Q, Delloye C, Bigare E, Van Isacker T. Is conservative treatment still defensible in grade III acromioclavicular dislocation? Are there predictive factors of poor outcome? Acta Orthop Belg. 2015;81(1):107-114.
9. Radiopaedia.org. Acromioclavicular injury. Available from: https://radiopaedia.org/articles/acromioclavicular-injury [Accessed 22 September 2016].