Acromioclavicular Joint Repair Utilizing a Button Technique for Chronic Instability: A Case Report

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Citation : Wijaya AA, Deviandry R, Utoyo GA. Acromioclavicular Joint Repair Utilizing a Button Technique for Chronic Instability: A Case Report. *Medicinus*. 2026.
Keywords: Acromioclavicular joint repair; Button technique; Chronic instability..
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Online First : 12 February 2026

Abstract

Background
Chronic acromioclavicular (AC) joint injuries are common in individuals engaged in overhead sports, resulting in persistent pain and functional limitations. This report presents a successful case of chronic AC joint injury repair using a button technique in a 26-year-old female patient, discussing the efficacy of this novel approach.

Case Description
A 26-year-old female presented with a two-year history of right shoulder pain and instability following a fall during a sporting event. Despite conservative treatments, including physical therapy and corticosteroid injections, her symptoms remained unresolved, culminating in a constant pain level of 7/10 on a Visual Analog Scale (VAS) with significant impairment in daily activities. On clinical examination, tenderness over the AC joint, a prominent distal clavicle, and restricted range of motion (especially abduction) were observed. Radiographic imaging confirmed a chronic Type III AC joint injury. The patient opted for surgical intervention. Under general anesthesia, a horizontal skin incision was made over the AC joint. The joint surfaces were prepared, and the AC joint was reduced. A biodegradable button was positioned through drill holes in the acromion and the distal clavicle, securing the joint. The surgery concluded with soft tissue closure and a sterile dressing application. Postoperatively, the patient was immobilized in a sling for four weeks, followed by a structured rehabilitation program. At the 6-month follow-up, the patient reported significant pain reduction (VAS score of 2) and was able to resume all pre-injury activities, achieving a Constant-Murley score of 85—indicating a marked improvement in shoulder function.

Conclusion
The button technique for repairing chronic AC joint injuries offers a minimally invasive option with promising outcomes in terms of pain relief and functional restoration. This case underscores the technique's potential as a reliable approach for similar injuries in young active individuals. Further studies are necessary to compare this method with traditional surgical techniques and to evaluate long-term outcomes.

Introduction

Chronic acromioclavicular (AC) joint injuries account for approximately 9% of all shoulder girdle injuries and are particularly prevalent among athletes engaged in contact or overhead sports, such as rugby, weightlifting, or volleyball.[1] Type III injuries—characterized by complete disruption of the acromioclavicular and coracoclavicular ligaments—remain a treatment gray zone.[2] While many cases are initially managed

conservatively, up to 20–30% of patients report persistent symptoms, including pain, instability, and diminished shoulder function, necessitating surgical intervention.[3] Chronic cases, defined as those persisting beyond three months without adequate healing, pose a greater challenge due to soft tissue scarring, joint degeneration, and compensatory biomechanical adaptations that impair standard reconstruction outcomes.

Surgical techniques for chronic AC joint instability range from open ligament reconstruction with allografts to hardware-based stabilization using hook plates or screws.[4,5] However, these methods are associated with notable complication rates—including hardware irritation (up to 60%), loss of reduction (up to 30%), and high rates of reoperation for hardware removal.[6] In response to these challenges, cortical fixation systems such as the button technique have emerged as minimally invasive alternatives. These constructs offer biomechanical stability by re-creating the function of the coracoclavicular ligaments through a transosseous suspension device. Although their use in acute injuries is well described, evidence supporting their application in chronic cases remains limited to small series and experimental models, with few clinical reports documenting long-term outcomes.[7]

This case report contributes to the growing body of literature by presenting the clinical application of a biodegradable button technique in the management of a chronic Rockwood Type III AC joint injury. The objective is to offer a focused clinical perspective on the feasibility, surgical technique, and early functional outcome of this approach, particularly in a patient demographic underrepresented in existing studies. While individual results must be interpreted with caution, this case supports the consideration of button-based fixation as a viable treatment option for selected patients with chronic AC joint instability.

Case Descrtiption

This case report was prepared in accordance with the CARE 2025 guidelines to ensure standardized and comprehensive reporting.[8] A 26-year-old right-handed female presented to our clinic with a two-year history of right shoulder pain and instability following a fall during a volleyball match. The patient reported persistent discomfort, mechanical "popping," and limitations in overhead activity that had not improved despite extensive conservative management, including six months of supervised physiotherapy, nonsteroidal anti-inflammatory medications, and three corticosteroid injections administered over a 12-month period. She denied any prior history of shoulder injuries or systemic illness. On physical examination, she demonstrated localized tenderness over the AC joint, visible prominence of the distal clavicle, and reduced active range of motion in abduction and forward flexion due to pain. Shoulder strength was preserved, but cross-body adduction and AC shear tests were positive, indicating instability. The Visual Analog Scale (VAS) pain score was 7/10, and functional impairment was noted in activities of daily living and sport.

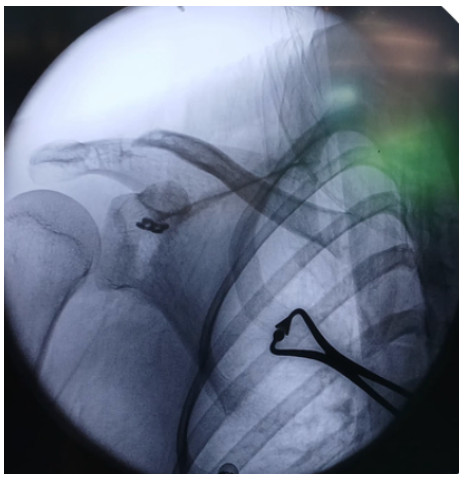

Figure 1. X-ray of the shoulder showing AC Rockwood Type III.

Radiographic imaging, including standard anteroposterior and axillary lateral views, confirmed a chronic Rockwood Type III AC joint injury with joint space widening and superior clavicular displacement. Given the chronicity and symptom burden, surgical intervention was recommended. After discussing available

options, the patient consented to undergo AC joint reconstruction using a biodegradable button fixation technique. Under general anesthesia, a horizontal incision was made over the AC joint. The joint was exposed, debrided, and reduced anatomically. A transosseous tunnel was drilled through the distal clavicle and acromion, and a biodegradable button construct was passed and secured, maintaining joint reduction under direct visualization. The procedure concluded with layered closure and sterile dressing. The patient was placed in an arm sling for four weeks postoperatively, with passive and active-assisted shoulder mobilization initiated at week five, followed by progressive strengthening from week eight.

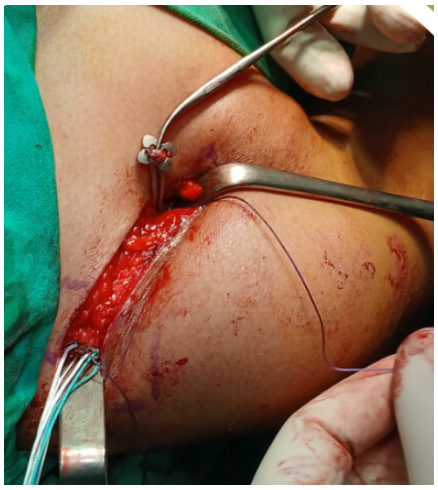

Figure 2. Intraoperative documentation of the patient.

At her 6-month follow-up, the patient reported substantial clinical improvement with a VAS score reduced to 2/10 and full return to pre-injury activity, including overhead sports. The Constant-Murley shoulder score improved to 85, reflecting marked gains in function, range of motion, and pain control. No postoperative complications were observed, and radiographs demonstrated maintained joint alignment without signs of hardware migration or failure. The favorable outcome suggests that the button technique may offer a viable and minimally invasive surgical alternative for managing chronic AC joint instability in young, active individuals.

Discussion

Chronic AC joint injuries, particularly Rockwood Type III, present a persistent management dilemma due to the lack of consensus regarding optimal treatment. While acute Type I and II injuries are typically managed conservatively, and Types IV–VI are generally treated surgically, Type III injuries fall into a gray zone.[9] Studies have shown that up to 30% of patients with Type III injuries eventually require surgical intervention due to ongoing pain, mechanical instability, or functional limitation despite conservative treatment efforts.[10–12] This case reinforces that prolonged symptoms and failed nonoperative therapy warrant consideration of surgical options even in mid-grade injuries.

Historically, techniques such as hook plate fixation, Weaver-Dunn procedures, and tendon graft reconstructions have been used in both acute and chronic AC joint repairs.[13] However, these methods are often associated with complications including hardware irritation, reoperation for plate removal (required in up to 80% of hook plate cases), and failure to achieve anatomical reduction. The biomechanical limitations of soft tissue reconstructions in chronic cases have also been highlighted, as scarring and ligament attenuation make durable fixation challenging.[14] Biomechanical studies have demonstrated that cortical button fixation, particularly double-button constructs, restore superior translation resistance and maintain reduction more reliably than traditional techniques.[15] This supports the use of button-based implants in chronic settings where primary ligament healing is no longer feasible.

The success of the present case using a single biodegradable button construct is noteworthy in the context of current evidence. A 2023 literature review by dr Groot et al. reported high functional outcomes and low complication rates with button techniques in acute injuries, but data on chronic cases remain sparse.[16]

Among the few studies evaluating chronic injuries, Chmielewski et al. demonstrated a 90% return-to-sport rate and significant improvement in functional scores using button fixation with tendon graft augmentation.[17] In contrast, our case suggests that even without graft augmentation, a biodegradable button construct alone may be sufficient in select cases, particularly when good bone quality and soft tissue integrity remain.

Another critical aspect of this case is the patient demographic, young, female, and physically active, which is underrepresented in the surgical AC joint literature.[18,19] Most studies to date have predominantly included male patients, often contact sport athletes. Given that shoulder kinematics and ligamentous laxity may differ between sexes, our successful outcome expands the evidence base for this technique's applicability in young female athletes.[20] The use of a biodegradable implant also addresses growing concerns about implant-related morbidity, foreign body reactions, and the need for hardware removal, thus aligning with current trends toward minimizing surgical burden.[21]

Conclusion

This case supports the evolving role of button fixation techniques as a viable surgical option for chronic AC joint instability, particularly in young, active patients who have exhausted conservative treatment. Compared to traditional methods, button constructs offer the advantages of anatomic reduction, mechanical durability, and lower hardware-related complications. Although limited by the single-case nature of this report, the positive clinical and functional outcome suggests that further comparative studies and long-term follow-up investigations are warranted to validate the efficacy and durability of button-based approaches in chronic AC joint reconstruction.

Acknowledgment

None.

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Author's Statement

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