



Case report

Recurrent shoulder instability in a patient with uncontrolled epileptic seizures: A decade-long clinical course ending in Eden-Hybinette procedure – A case report

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ABSTRACT

Introduction: Epileptic seizures can cause recurrent shoulder instability due to violent muscle contractions, often leading to glenoid bone loss. Proper seizure management and surgical intervention are crucial for stability.

Case presentation: A 24-year-old male with epilepsy experienced recurrent anterior shoulder dislocations despite prior Bankart repair and remplissage. Progressive glenoid bone loss necessitated an Eden-Hybinette procedure using an autologous iliac crest bone graft, successfully restoring stability.

Discussion: Seizure-induced dislocations often require revision surgery. While Bankart repair may fail in epilepsy-related cases, the Eden-Hybinette procedure effectively addresses glenoid defects. Seizure control is key to preventing recurrence.

Conclusion: This case underscores the importance of seizure management and the Eden-Hybinette procedure as a viable revision strategy for epilepsy-related recurrent shoulder instability.

1. Introduction

Seizures and epilepsy pose significant challenges for patients, not only due to their disabling effects and unpredictable nature but also because of a higher incidence of seizure-related injuries, such as shoulder instability, compared to the general population [1]. Shoulder dislocations may occur either without direct trauma or as a result of a fall during a seizure [2]. Currently, there is no universally accepted surgical procedure as the preferred treatment for primary or revision surgery in cases of anterior shoulder instability in this specific population [3]. Both soft tissue procedures and the Latarjet procedure have shown suboptimal outcomes in epilepsy patients, with recurrence rates significantly higher than in non-epileptic individuals [4]. These recurrences are attributed to ongoing seizure activity and the challenges of tailoring surgical approaches to this unique subset of patients. The Eden-Hybinette procedure has demonstrated favorable outcomes in addressing severe glenoid bone loss and in cases where prior soft tissue or Latarjet procedures have failed [5]. However, reports of its application with an autologous iliac crest bone graft in epilepsy-related cases are limited. This study presents a 10-year follow-up of a patient with

epilepsy-induced recurrent shoulder dislocations. The patient initially underwent Bankart repair and remplissage but later required an Eden-Hybinette procedure due to progressive glenoid bone loss exacerbated by uncontrolled seizures. This case has been reported in accordance with the SCARE Checklist 2023 [6].

2. Presentation of case

A 24-year-old male presented with recurrent right shoulder dislocations associated with idiopathic generalized epilepsy, managed with medication. The first dislocation occurred during an epileptic seizure over a year before presentation, requiring closed reduction. Subsequent episodes, triggered by physical activities such as throwing motions, rafting, and stretching, were mostly self-reduced. Examination revealed nearly full range of motion (ROM) in the affected shoulder with positive apprehension, relocation, and anterior drawer tests, but no signs of general joint laxity. Three-dimensional (3D) computed tomography (CT) and magnetic resonance imaging (MRI) revealed a bony Bankart lesion on the anterior glenoid rim and a significant Hill-Sachs deformity. (Fig. 1). As the glenoid bone defect was less than 20 %, the patient was

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scheduled for arthroscopic Bankart repair combined with remplissage.

During arthroscopy, a detached anterior-inferior labrum with fibrotic changes was identified (Fig. 2A), along with a 3×4 cm Hill-Sachs lesion on the posterolateral humeral head (Fig. 2B). After decorication of the lesion using a shaver and curette (Fig. 2C), two suture anchors were inserted (Fig. 2D), and sutures were passed through the infraspinatus muscle. The Bankart lesion was repaired with four suture anchors after preparing the glenoid rim (Fig. 2E–G). Finally, the remplissage was completed by tying the suture strands, securing the joint capsule to the Hill-Sachs lesion (Fig. 2H).

At the 3-month follow-up, the patient demonstrated nearly full ROM. However, the patient failed to return for the 6-month follow-up and presented 2 years and 2 months later with recurrent dislocation symptoms. Having self-discontinued epilepsy medication after being seizure-free, he experienced a generalized tonic-clonic seizure approximately three months before this visit, resulting in recurrent dislocations. A repeat CT scan revealed a 20–30 % glenoid bone defect. A Latarjet procedure was planned, and arrangements were made to schedule the surgery and perform an MRI at the next visit. However, the patient was lost to follow-up.

Approximately 8 years and 3 months after the initial surgery, the patient unexpectedly returned to the outpatient clinic. He reported experiencing over 10 dislocation episodes per month until recently, each of which he had self-reduced. The patient had originally worked at a logistics center, which required a high level of physical activity. However, after the first surgery, he changed jobs to an office position, limiting his activities to indoor clerical work. After undergoing vagus nerve stimulation at another hospital, he reported no generalized seizures in the past two years. Repeat 3D CT and MRI scans revealed severe bone loss of approximately 50 % on the anterior glenoid rim (Fig. 3). Due to the severity of the bone defect, the previously planned Latarjet procedure was deemed unsuitable, and an Eden-Hybinette procedure using an iliac bone graft was planned.

Under general anesthesia with a brachial plexus block, a tricortical bone graft was harvested from the right iliac crest. A portion of the periosteum at the margin was retained to facilitate repair with the joint capsule. The graft was shaped to match the glenoid defect and provide a proper articular contour (Fig. 4A). A deltopectoral approach exposed the glenoid, and curettage and debridement prepared the defect area. The graft was positioned and secured with two 3.5 mm cortical screws. (Fig. 4B). Intraoperative fluoroscopy confirmed alignment and fixation. ROM testing verified stability without dislocation or impingement.

The shoulder was immobilized for 4 weeks, followed by progressive physiotherapy, starting with passive ROM and advancing to strengthening exercises by week 6. Full ROM was regained by the 12-week mark. No complications were observed. The patient remained in his office job and resumed daily activities without difficulty. He reported engaging only in light physical activity such as occasional jogging, and has avoided high-intensity weight training or any exercises that could risk

shoulder dislocation. Importantly, following vagus nerve stimulation, the patient did not experience any further seizures, and no additional seizure treatment was required during the follow-up period. A follow-up CT scan at 6 months and plain radiographs at 1 year confirmed full graft integration with stable fixation and alignment (Fig. 5). Due to his stable clinical condition at the 1-year follow-up, a subsequent visit was planned for the following year; however, the patient did not return for further evaluation.

3. Discussion

This case report highlights the clinical application of the Eden-Hybinette procedure using an autologous iliac crest graft in a patient with epilepsy and recurrent shoulder instability, following the progression of glenoid bone loss over a decade. Although the follow-up after surgery was relatively short, the case illustrates the potential utility of this procedure in addressing significant bone defects where previous interventions have failed. More importantly, this case provides valuable insights into the long-term consequences of poorly controlled epilepsy on shoulder stability, emphasizing the critical importance of sustained seizure control in preventing recurrence and progressive joint damage.

Managing shoulder instability in patients with seizure disorders requires a multidisciplinary approach, emphasizing the treatment of the underlying seizure disorder to reduce the risk of future episodes. Since surgical interventions can act as stressors that lower the threshold for subsequent seizures, collaboration with a neurology team to optimize anticonvulsive medication management is essential. Moreover, poor compliance with anticonvulsive medications remains a significant risk factor for recurrent seizures, making it crucial for all care teams to closely monitor medication adherence during this period [7].

The Eden-Hybinette procedure has been employed both as a primary treatment for recurrent anterior shoulder instability with substantial glenoid bone loss and as a revision procedure. Warner et al. [8] reviewed 11 patients who underwent the Eden-Hybinette procedure, 9 of whom had previously failed surgeries. All patients returned to their pre-injury level of sports activity without experiencing apprehension or instability. Postoperative imaging revealed no evidence of arthritis, graft resorption, hardware failure, or impingement.

One of the key advantages of the Eden-Hybinette procedure is its ability to address large glenoid defects by tailoring the graft to the specific morphology of the defect [9]. This approach ensures maximal bone-to-bone contact, which is critical for graft stability and long-term success. Additionally, it allows for the restoration of the normal articular surface's level and contour, further enhancing joint function and stability. Such precise adaptation makes this procedure particularly effective in cases with substantial glenoid bone loss, where other techniques may fall short.

Given the high failure rate of surgical management in patients with poorly controlled epilepsy, previous studies have recommended

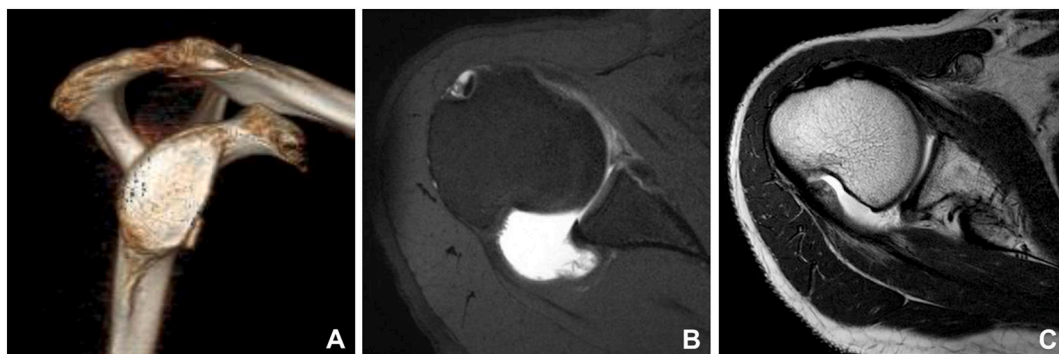


Fig. 1. (A) 3D reconstruction of CT showing the bony Bankart lesion on the right shoulder. Glenoid bone defect is less than 20 %. (B) Axial fat-suppressed T1-weighted and (C) T2-weighted magnetic resonance imaging showing the definite Bankart lesion and large sized Hill-Sachs lesion.

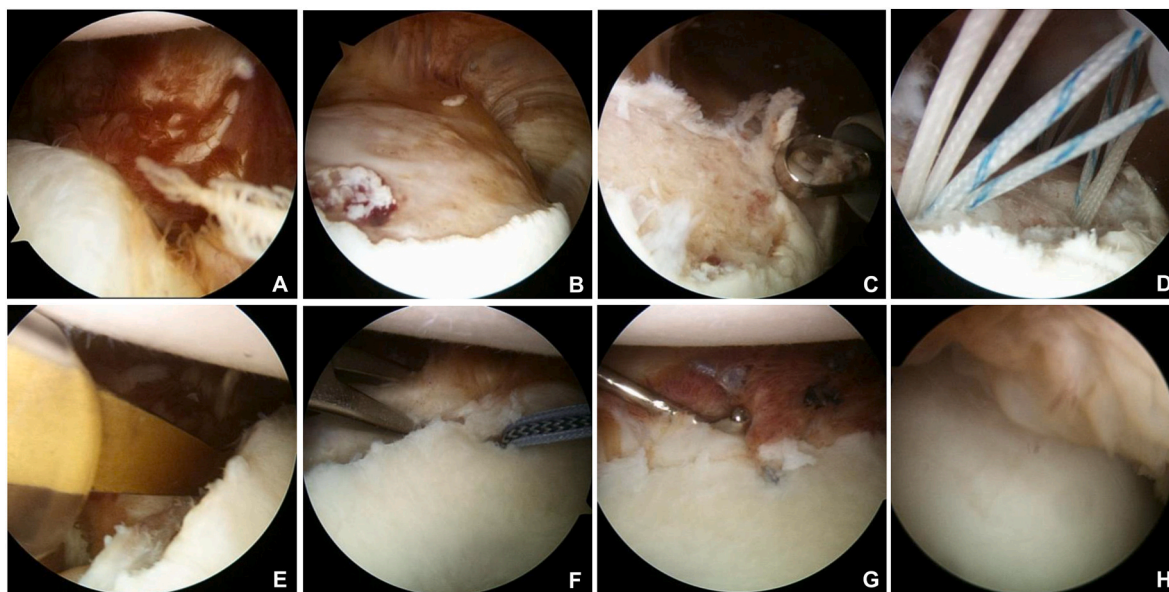


Fig. 2. Procedures of arthroscopic Bankart repair and remplissage. (A) Detached anterior-inferior labrum with fibrotic changes. (B) Hill-Sachs lesion with cartilage defect. (C) Decortication of the Hill-Sachs lesion. (D) Suture anchors inserted for remplissage. (E) Preparation of glenoid margin. (F, G) Bankart repair using four suture anchors. (H) Final tying of sutures to secure the joint capsule to the Hill-Sachs lesion.

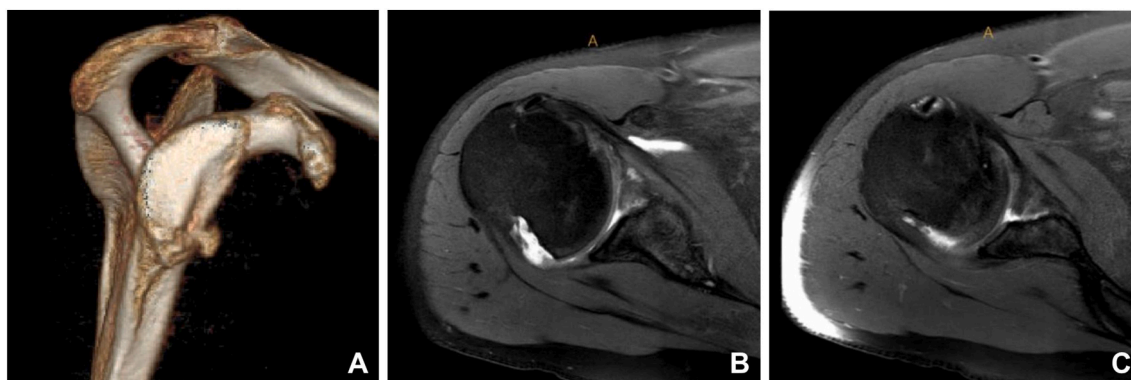


Fig. 3. (A) 3D reconstruction of CT and (B, C) axial proton density fat-saturated MRI showing the significant bone defect (approximately 50 %) on the anterior glenoid rim and detached capsule and infraspinatus muscle from the Hill-Sachs lesion.

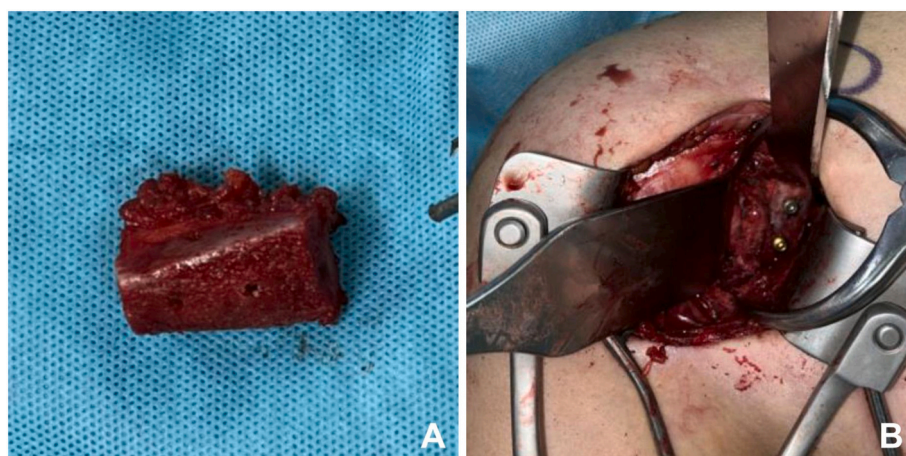


Fig. 4. (A) Tricortical bone was harvested. (B) The harvested iliac bone graft was positioned onto the prepared anterior glenoid rim and secured with two 3.5 mm cortical screws.



Fig. 5. CT images taken at the 6-month postoperative follow-up and plain radiographs taken at the 1-year postoperative follow-up demonstrate the union of the graft to the glenoid.

reserving soft tissue procedures and the Latarjet procedure for carefully selected patients with well-controlled seizures. While the Eden-Hybinette procedure provides a more reliable option for addressing significant bone loss in patients with poorly controlled seizures, it cannot fully mitigate the risks associated with repeated seizures. Thus, achieving seizure control remains the most critical factor for ensuring long-term success.

4. Conclusion

In conclusion, the Eden-Hybinette procedure is an effective revision technique for managing recurrent anterior shoulder dislocations in patients with epilepsy. Achieving optimal seizure control is crucial, as recurrence of seizures inevitably leads to progression of lesions, regardless of the initial severity. While soft tissue procedures can yield good outcomes in cases with mild bone defects and no seizure recurrence, seizure management remains the most critical factor in determining long-term prognosis.

Abbreviations

ROM	Range of motion
3D	Three-dimensional
CT	Computed tomography
MRI	Magnetic resonance imaging

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Ethical approval

This case report was approved by the Institutional Review Board.

Guarantor

Jun-bum Kim accepts full responsibility for the work, had access to the data, and controlled the decision to publish.

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Author contribution

Soon-do Wang: Conceptualization, project administration
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 Woo-jong Kim: Validation, visualization
 Jun-bum Kim: writing—review and editing, resources

Declaration of competing interest

The authors declare no conflicts of interest.

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