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Case Report

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A Case on Posterior Shoulder Dislocation: The Hidden Injury

Tigy Thomas Jacob[1*], Salman Ul Faris A[1] & Adithye Varghese[1]

[1]Department of Orthopaedics, Government Medical College, Kottayam, Kerala, India

HIGHLIGHTS

- Electrocution-related posterior dislocation
- High rate of missed diagnosis
- Engaging reverse Hill-Sachs lesion
- Arthroscopic modified McLaughlin repair
- Excellent short-term functional outcome

Key Words:
Posterior shoulder dislocation
Reverse Hill-Sachs lesion
Electrocution injury
Arthroscopic modified
McLaughlin procedure
Reverse Bankart lesion
Shoulder instability

ABSTRACT

Introduction: Posterior shoulder dislocation (PSD) is a rare injury, accounting for a small proportion of glenohumeral dislocations, and is frequently missed at initial presentation due to subtle clinical signs and inconclusive standard radiographs. Delayed diagnosis may result in persistent instability, pain, and early degenerative changes, particularly when associated with osseous defects such as the reverse Hill-Sachs lesion (rHSL). Electrocution is a classic but often under-recognized mechanism leading to PSD because injury can occur without direct trauma. **Case Presentation:** We report the case of a 21-year-old male who presented with acute pain and restricted external rotation of the right shoulder following accidental electrocution. Clinical examination revealed the arm held in addition and internal rotation with limited external rotation. Plain radiographs demonstrated features suggestive of posterior dislocation, including the lightbulb and trough line signs. Following closed reduction, magnetic resonance imaging revealed an engaging reverse Hill-Sachs lesion involving approximately 30% of the humeral head, with an associated reverse Bankart lesion. Given the size and engagement of the defect, the patient underwent an arthroscopic modified McLaughlin procedure combined with posterior labral repair. **Result:** Postoperative rehabilitation resulted in a satisfactory range of motion and return to functional activity, with no evidence of instability at three-month follow-up. **Conclusion:** This case highlights the importance of maintaining a high index of suspicion for PSD following electrocution. Advanced imaging is essential for identifying rHSLs and guiding management. Arthroscopic defect-addressing procedures combined with capsulolabral repair provide a reliable, joint-preserving solution in young patients with engaging humeral head defects.

*** Corresponding Author:** Tigy Thomas Jacob, e-mail: salman6159@gmail.com
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INTRODUCTION

Posterior shoulder dislocation (PSD) is an uncommon injury pattern, representing a small fraction of all glenohumeral dislocations, yet it carries a disproportionately high risk of missed diagnosis and delayed definitive care [1]. Studies emphasize that PSD often presents without the obvious deformity seen in anterior dislocations; instead, patients frequently hold the arm in adduction and internal rotation with a characteristic inability to externally rotate, a clinical clue that can be overlooked in busy emergency settings [2]. When PSD is missed or inadequately treated, the humeral head may remain locked posteriorly or evolve into recurrent posterior instability, leading to pain, restricted motion, and early degenerative changes [3].

Mechanistically, PSD is strongly associated with seizure activity, electrical shock, and high-energy trauma [4]. In electrocution injuries, sudden involuntary muscle contractions-dominated by the powerful internal rotators-can displace the humeral head posteriorly even in the absence of direct impact, which may reduce clinical suspicion and contribute to under-imaging or misinterpretation [5]. Importantly, PSD frequently occurs along a spectrum ranging from acute dislocation to posterior fracture-dislocation with complex bipolar bone loss, and management decisions increasingly rely on careful characterization of both the humeral head defect and the posterior glenoid [6-8].

A hallmark associated lesion is the reverse Hill-Sachs lesion (rHSL)-an impaction defect of the anteromedial humeral head created when the dislocated humeral head engages the posterior glenoid rim [6]. Recent systematic reviews highlight that the *presence, size, and engagement behavior* of rHSL are pivotal in determining stability after reduction and in selecting operative strategy [7,8]. In parallel, posterior glenoid bone loss and abnormal glenoid version are increasingly recognized contributors to persistent posterior instability and failure of isolated soft-tissue repairs [9,10]. The broader concept of "bone loss in shoulder instability," including combined (bipolar) defects, has become central to modern treatment algorithms and helps explain why recurrence can occur even after technically adequate labral repair when osseous pathology is not addressed [6,9].

Imaging therefore plays a decisive role. While axillary or scapular-Y views improve detection, acute pain can limit positioning; moreover, standard anteroposterior (AP) radiographs may appear deceptively acceptable unless subtle signs are actively sought [11]. A recent report re-emphasizes the light-bulb sign as a practical "red flag" on AP imaging, prompting further evaluation with CT or MRI [12]. Advanced imaging is essential not only to confirm the direction of dislocation but also to quantify humeral and glenoid bone loss, assess engagement, and identify soft-tissue injuries such as posterior labral detachment (reverse Bankart), capsular nsufficiency, insufficiency, or associated fractures [5,7].

Treatment has evolved toward individualized, defect-based strategies. Contemporary reviews and consensus work stress that isolated capsulolabral fixation may be insufficient when an engaging rHSL or substantial posterior glenoid bone loss exists [13,14]. For rHSL, joint-preserving options include open or arthroscopic modified McLaughlin–type procedures (subscapularis transfer/remplissage variants) and grafting techniques, with procedure selection guided by defect size, chronicity, and cartilage viability [8,15]. Arthroscopic refinements continue to expand, including newer reverse remplissage concepts using alternative tissues for defect filling [16].

CASE PRESENTATION

A 21-year-old male presented to the emergency department with acute pain and restricted movement of the right shoulder following accidental electrocution at the workplace. There was no history of fall, direct trauma, or previous shoulder instability. Immediately after the incident, the patient noticed severe shoulder pain and inability to externally rotate the arm.

On physical examination, the right shoulder was held in adduction and internal rotation. Active and passive external rotation were markedly restricted. A subtle posterior prominence of the humeral head was palpable, with no neurovascular deficit in the affected limb. Due to pain and guarding, axillary view radiographs were difficult to obtain initially.

Investigations:

Plain radiographs of the right shoulder revealed features suggestive of posterior dislocation, including the light-bulb sign and a distinct trough line sign, indicating an impaction fracture of the anteromedial humeral head.

Following closed reduction under procedural sedation, an MRI of the shoulder was performed for comprehensive evaluation. MRI demonstrated a wedge-shaped cortical depression with subjacent bone marrow edema in the anteromedial humeral head, consistent with a reverse Hill-Sachs lesion, along with an associated reverse Bankart lesion involving the posterior labrum. Quantitative assessment revealed an alpha angle of 96° with approximately 30% humeral head bone loss, indicating a high risk of recurrent instability if managed with isolated soft-tissue repair.

Management

Given the size and engaging nature of the reverse Hill-Sachs lesion, surgical intervention was planned. The patient underwent an arthroscopic modified McLaughlin procedure combined with reverse Bankart repair.

Arthroscopy confirmed the posterior labral detachment and the engaging humeral head defect. Suture anchors were placed into the humeral head defect, and a remplissage using the subscapula-

ris tendon was performed without detaching it from the lesser tuberosity, effectively filling the defect and preventing engagement. Posterior labral repair was carried out using suture anchors to restore capsulolabral tension and joint stability.

Postoperatively, the shoulder was immobilized in neutral rotation. A structured rehabilitation protocol was initiated, with gradual progression from passive to active-assisted and active range-of-motion exercises.

At one month, the patient achieved a satisfactory range of motion with minimal pain and good functional recovery. At three-month follow-up, he remained asymptomatic, with no clinical signs of posterior instability and return to daily activities.

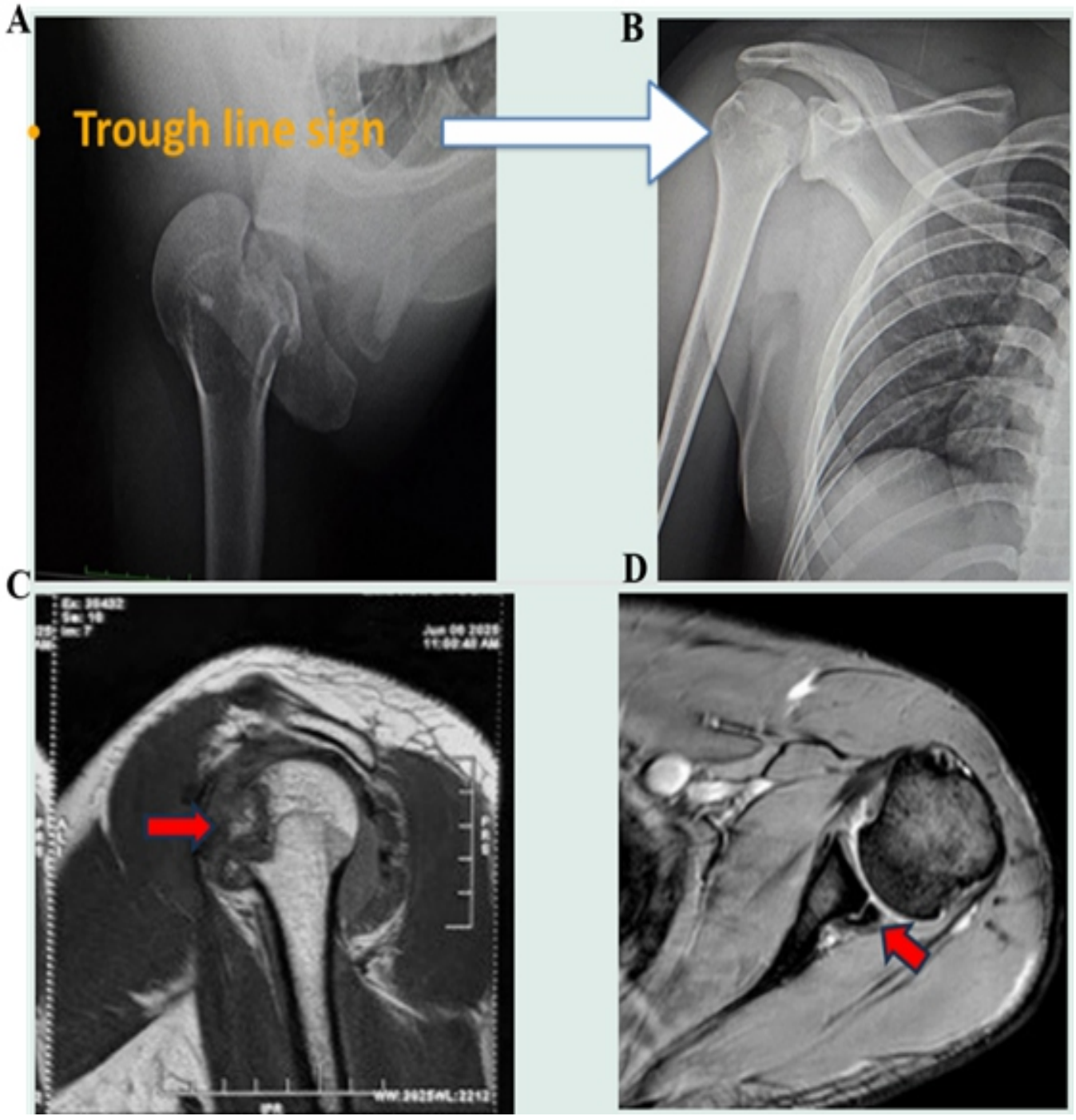

Figure 1: Radiological features of posterior shoulder dislocation with reverse Hill-Sachs lesion. (A) Pre-reduction anteroposterior radiograph of the right shoulder demonstrating the trough line sign (arrow), indicative of an anteromedial humeral head impaction fracture. **(B)** Post-reduction radiograph showing restoration of glenohumeral alignment. **(C)** Coronal MRI image revealing a wedge-shaped cortical depression with surrounding marrow edema in the anteromedial humeral head, consistent with a reverse Hill-Sachs lesion (arrow). **(D)** Axial MRI image demonstrating the reverse Hill-Sachs defect with associated posterior capsulolabral (reverse Bankart) injury (arrow).

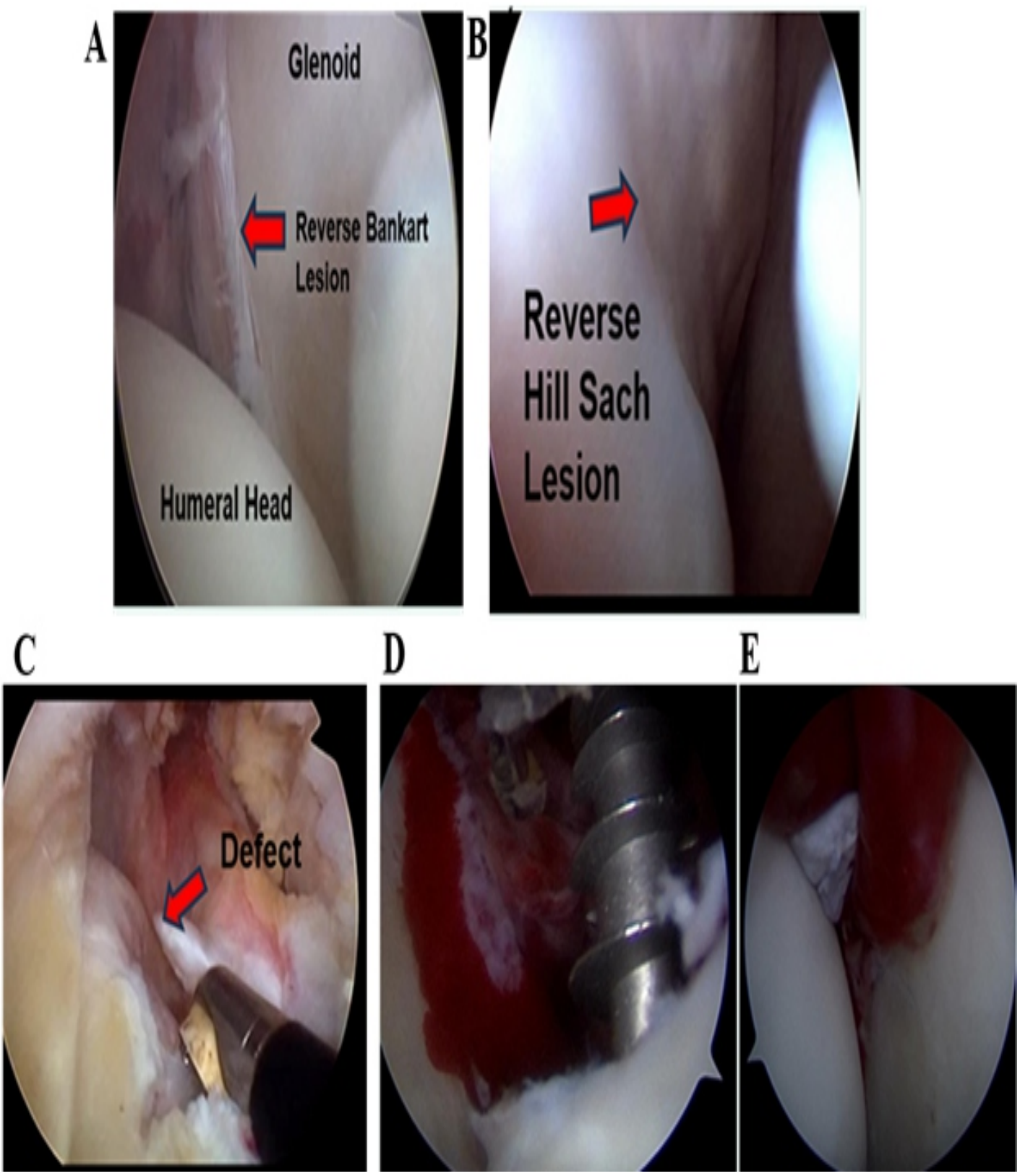

Figure 2: Arthroscopic intra-operative image panel demonstrating lesion morphology and surgical management. (A) Arthroscopic view of the posterior glenoid showing a reverse Bankart lesion (arrow) with detachment of the posterior labrum from the glenoid rim. **(B)** Arthroscopic visualization of the reverse Hill-Sachs lesion (arrow) on the anteromedial humeral head, confirming an engaging osseous defect. **(C)** Identification of the humeral head defect (arrow) during arthroscopy before reconstruction. **(D)** Placement of a suture anchor into the reverse Hill-Sachs defect as part of the modified McLaughlin procedure. **(E)** Final remplissage using the subscapularis tendon, filling the humeral head defect without detachment from the lesser tuberosity, thereby restoring joint congruity and preventing engagement.

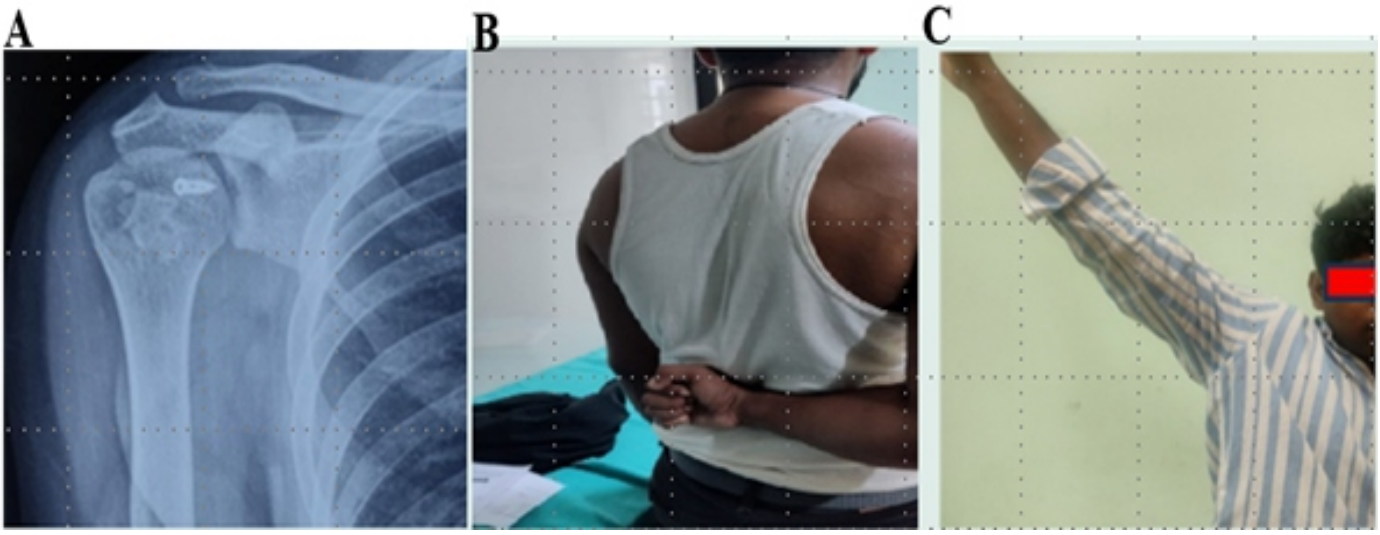

Figure 3: Postoperative radiological and clinical outcomes following arthroscopic management of posterior shoulder dislocation. (A) Postoperative anteroposterior radiograph of the right shoulder demonstrating restoration of glenohumeral joint congruity with maintained humeral head alignment. **(B)** Clinical photograph showing satisfactory internal rotation with the hand reaching the lower back, indicating functional recovery. **(C)** Clinical photograph demonstrating active overhead abduction of the affected shoulder, reflecting good postoperative range of motion and absence of instability.

DISCUSSION

This case illustrates a high-yield clinical scenario: acute shoulder pain and blocked external rotation following electrocution, culminating in PSD with a substantial rHSL and associated posterior labral injury. Modern literature consistently emphasizes that PSD remains under-recognized and that diagnostic delay is the major driver of poor outcomes, particularly when the joint becomes locked and osseous defects enlarge or become "engaging [1,3]" In electrical injuries, the absence of obvious trauma may further reduce clinician suspicion; recent literature describes missed PSD after electric shock, reinforcing the need for protocolized imaging and careful clinical examination [5].

A central determinant of stability in PSD is the rHSL. Systematic reviews published in 2024 establish that rHSL addressing surgery generally yields favorable stability and functional outcomes when appropriately matched to defect characteristics, but outcomes worsen with delayed presentation and when bone loss is underappreciated [6,7].

These findings align with broader bone-loss principles in shoulder instability: bipolar bone defects (humeral rHSL plus posterior glenoid bone loss) can synergistically destabilize the joint, raising failure risk for isolated soft-tissue stabilization [9,10]. Contemporary reviews focused on posterior glenoid bone loss underscore that "critical" posterior bone loss thresholds are still being refined, but there is increasing support for osseous augmentation in selected patients with structural deficits or unfavorable version [9,17].

In the present case, the management strategy reflects current defect based reasoning by addressing both the humeral head defect and posterior capsulolabral pathology. Recent reviews of the modified McLaughlin procedure demonstrate generally good clinical results and low recurrence when performed early and when defect size/chronicity are appropriate [8,18].

This time-sensitivity is echoed in studies of locked posterior dislocations, where delay from injury to treatment is repeatedly associated with inferior functional recovery and a higher likelihood of needing more invasive reconstruction [19,20].

The arthroscopic modified McLaughlin technique has gained prominence due to reduced soft-tissue disruption, the ability to treat intra-articular pathology comprehensively, and potentially faster rehabilitation compared with open approaches [21].

Arthroscopic technical descriptions-including lateral-decubitus approaches combining posterior labral repair with subscapularis transfer-provide reproducible steps to stabilize moderate rHSLs while restoring joint congruity [16]. The concept of "reverse remplissage" continues to evolve, with recent techniques describing alternative tissue constructs (e.g., middle glenohumeral ligament augmentation) to fill defects while preserving subscapularis integrity in selected cases [16].

However, it is equally important to recognize where rHSL-focused procedures may be insufficient. Recent systematic comparisons suggest that, in some defect patterns, grafting approaches can provide results comparable to McLaughlin-type procedures, highlighting that no single technique is universally superior and that lesion geometry, cartilage condition, and patient demands should guide selection [7]. Additionally, when posterior glenoid deficiency is substantial, modern surgical literature increasingly supports posterior bone block reconstructions (open or arthroscopic), including newer fixation strategies designed to reduce screw-related complications [17].

Finally, from a diagnostic standpoint, reinforcing recognition of radiographic warning signs remains clinically relevant. A recent study re-highlights the AP light-bulb sign and the broader message that any suspected PSD should trigger orthogonal views and advanced imaging when uncertainty persists [12].

CONCLUSION

Posterior shoulder dislocation following electrocution is an uncommon injury and is frequently overlooked because of its subtle clinical and radiographic presentation. The presence and size of an associated reverse Hill-Sachs lesion are critical determinants of post-reduction stability and play a central role in guiding definitive management. In young and active patients with engaging humeral head defects, the arthroscopic modified McLaughlin procedure combined with reverse Bankart repair provides a reliable, joint-preserving solution. This approach effectively addresses both the osseous and soft-tissue components of instability, resulting in stable fixation, restoration of joint congruity, and favourable functional recovery when performed promptly.

CLINICAL SIGNIFICANCE

Posterior shoulder dislocation should always be considered in patients presenting with shoulder pain and restricted external rotation following seizures or electrical injuries, even in the absence of obvious trauma. Advanced imaging with MRI or CT is essential for accurate diagnosis, assessment of reverse Hill-Sachs lesions, and quantification of humeral head bone loss. Isolated capsulolabral repair is often insufficient when significant humeral head defects are present, as failure to address the bony lesion may result in persistent or recurrent instability. Arthroscopic modified McLaughlin procedure offers excellent stability with minimal morbidity and should be strongly considered in appropriately selected patients.

ABBREVIATIONS

- **PSD:** Posterior Shoulder Dislocation
- **rHSL:** Reverse Hill-Sachs Lesion
- **MRI:** Magnetic Resonance Imaging
- **AMM:** Arthroscopic Modified McLaughlin
- **ROM:** Range of Motion

AUTHOR INFORMATION

Dr. Tigy Thomas Jacob: Professor & HOD
Dr. Salman Ul Faris A: Senior resident
Dr. Adithye Varghese: Senior resident

AUTHOR CONTRIBUTIONS

All authors significantly contributed to the study conception and design, data acquisition, or data analysis and interpretation. They participated in drafting the manuscript or critically revising it for important intellectual content, consented to its submission to the current journal, provided final approval for the version to be published, and accepted responsibility for all aspects of the work. Additionally, all authors meet the authorship criteria outlined by the International Committee of International Committee of Medical Journal Editors (ICMJE) guidelines.

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CONFLICT OF INTEREST

Authors declared that there is no conflict of interest.

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CONSENT FOR PUBLICATION

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USE OF ARTIFICIAL INTELLIGENCE (AI) & LARGE LANGUAGE MODEL (LLM)

The authors confirm that no AI & LLM tools were used in the writing or editing of the manuscript, and no images were altered or manipulated using AI & LLM.

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