Recurrence Rates and Outcomes of Shoulder Stabilization Surgery in Patients with Seizures

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INTRODUCTION: Patients with seizure disorders are at risk for shoulder instability. Management of these patients is challenging given they often present with more complex pathology and higher bone loss compared to patients without seizures. This leads to high recurrence rates and varied functional outcomes. This study aims to evaluate demographic trends, functional outcomes, and recurrence rates in patients with seizure disorders undergoing shoulder stabilization surgery.

METHODS: This is a single institution, retrospective study of patients with at least one seizure occurrence prior to operative treatment for recurrent shoulder instability. Procedures were performed by 7 surgeons between 2009-2023. Primary procedures included Bankart repair, Latarjet, distal tibial allograft, Hill Sachs bone grafting, and remplissage. Data collected from electronic medical records included patient demographics, clinical outcomes, functional markers, and recurrence.

RESULTS: A total of 75 patients (58 male, 17 female) with recurrent shoulder instability experienced at least one seizure on average 2.4 years prior to index procedure. Among them, 36 patients were diagnosed with epilepsy, and 39 had psychogenic, non-epileptic seizure events. The mean age at time of instability surgery was 29.6 ± 8.2 years, with a mean follow-up period of 2.1 ± 3.1 years. Patients averaged a BMI of 28.6 ± 6.7 kg/m^2, a Charlson Comorbidity Index (CCI) of 0.3 ± 0.8, and an American Society of Anesthesiologists (ASA) physical classification score of 2.1 ± 0.5. At the time of surgery, 26 patients were smokers. All patients with epilepsy were treated pharmacologically for their seizures. Recurrent instability was the primary indication for surgery in all patients. Surgical management included arthroscopic labral repair (n=39) or open bone grafting (n=36). Instability was anterior in 64 patients, multidirectional in 7 patients, and posterior in 3 patients. Average glenoid bone loss was 20.7%. Glenoid or humeral bone augmentation was used in 30 cases, with allograft being utilized most often (n=16). Notably, the only functional marker that had statistically significant difference was external rotation range of motion, decreasing from 56^o ± 25^o preoperatively to 47^o ± 19^o postoperatively (p=0.015). Otherwise, functional markers including range of motion and strength did not show significant difference when compared before and after surgery. Overall, 22 of 75 patients experienced recurrent instability after their primary surgery (29.3%). The recurrent instability rate for patients undergoing arthroscopic labral repair was 17 of 39 (43.6%) and 5 of 36 for open bone grafting (13.9%). There were 13 patients with epilepsy and seizure recurrence following Latarjet. Among them, one patient had a recurrence of instability, while no other complications were noted in the remaining patients. In this cohort, 10 patients required revision surgery (13.3%) at an average of 2.9 years following the initial procedure. Revision free was 82.6% at 2-years, 75.8% at 5-years, and 55.2% at 10-years.

DISCUSSION AND CONCLUSION: Patients with shoulder instability and seizure disorders are a challenging subset of patients who have a relatively high recurrent instability rate after surgical management compared to non-seizure patients. Functional markers either significantly decreased or remained comparable, emphasizing the overall goal of attaining shoulder stability. Patients undergoing arthroscopic labral repair had a higher rate of recurrence when compared to those undergoing open bone grafting as their stabilization procedure. Addressing bone loss, reported at an average of 20.7% in this cohort, and reducing recurrent seizures is crucial to the success of these procedures. Preoperative planning and careful patient counseling are necessary to improve postoperative outcomes.

Figure I Revision Free Survival

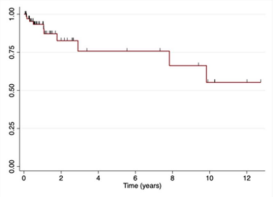

Table I Shoulder Stabilization Procedure Type

Procedure Type	Number of Procedures
Latarjet	24
Anterior labral repair	21
Bankart repair	13
Hill Sachs bone grafting	12
Posterior labral repair	11
Distal tibial allograft	5
Remplissage	4

Note: Multiple procedures may apply to the same case

Table II Comparison of Preoperative and Postoperative Functional Outcomes

	Preoperative	Postoperative	p-value
External Rotation ROM	56^o ± 25^o	47^o ± 19^o	**0.015**
Forward Elevation ROM	147^o ± 35^o	146^o ± 33^o	0.860
Internal Rotation ROM	T11	T12	0.301
External Rotation strength	5/5	5/5	0.188
Forward Elevation strength	5/5	5/5	0.375
Internal Rotation strength	5/5	5/5	0.938

Note: ROM, Range of motion

Table III Instability Recurrence Rates

Type of Procedure	Patients	Instability Recurrences	Recurrence Rate (%)
Overall	75	22	29.3
Arthroscopic Labral Repair	39	17	43.6
Open Bone Grafting	36	5	13.9