

The Raj Kumar (RK) Test As A Pathognomonic Test For Superior Labrum Anterior Posterior (SLAP) Lesions And Shoulder Instability

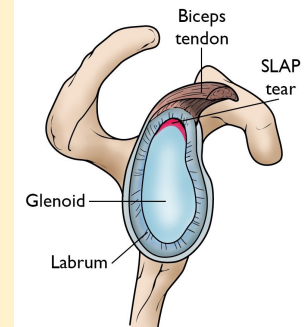
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MANDATORY FACULTY DISCLOSURE

- All the authors have no financial conflict of interest to disclose

WHY THIS STUDY ?

- SLAP lesions – 6 - 26 %⁽¹⁻⁴⁾ ; upward annual trend^(5,6)
- Difficult to diagnose SLAP lesions reliably
- High chance of missing – conservative management is unsuccessful in most patients^(7,8)
- Current clinical tests for SLAP^(9,10) :
 - **No one specific test for SLAP lesions**
 - Own set of limitations
 - None consider the **effect of Deltoid activity** in controlling the glenohumeral movements of the shoulder joint



PURPOSE OF THE STUDY

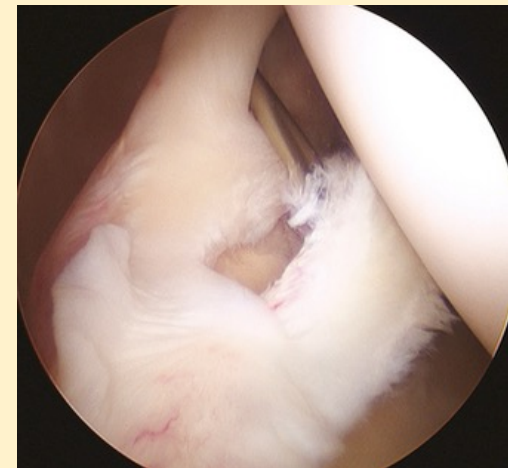
- To Present the RK test
- To evaluate sensitivity, specificity, positive and negative predictive values of the RK test

METHODOLOGY

- Prospective Study - done at St. John's Medical College Hospital, Bangalore
- Inclusion criteria :
 - All patients who presented to OPD with complaints of shoulder pain associated with or without popping/clicking/catching/locking in shoulder, with a suspected labral injury.
- Exclusion criteria :
 - Patients with a history of multiple dislocations, previously undergone surgery for a rotator cuff tear/shoulder instability, previous proximal humerus fracture & non-compliant patients were excluded.

PRE-REQUISITES OF THE RK TEST

- **Full range of motion** of the shoulder joint
- Secondary causes of pain to be ruled out
- **No lax ligaments**



STEPS OF THE RK TEST : 1

- Performed with patient in a sitting position on a stable platform, with the examiner standing behind the patient.
- The test should be performed on the normal side first.
- Patient is instructed to flex the elbow & abduct the shoulder and to place his or her palm over the nape of the neck.



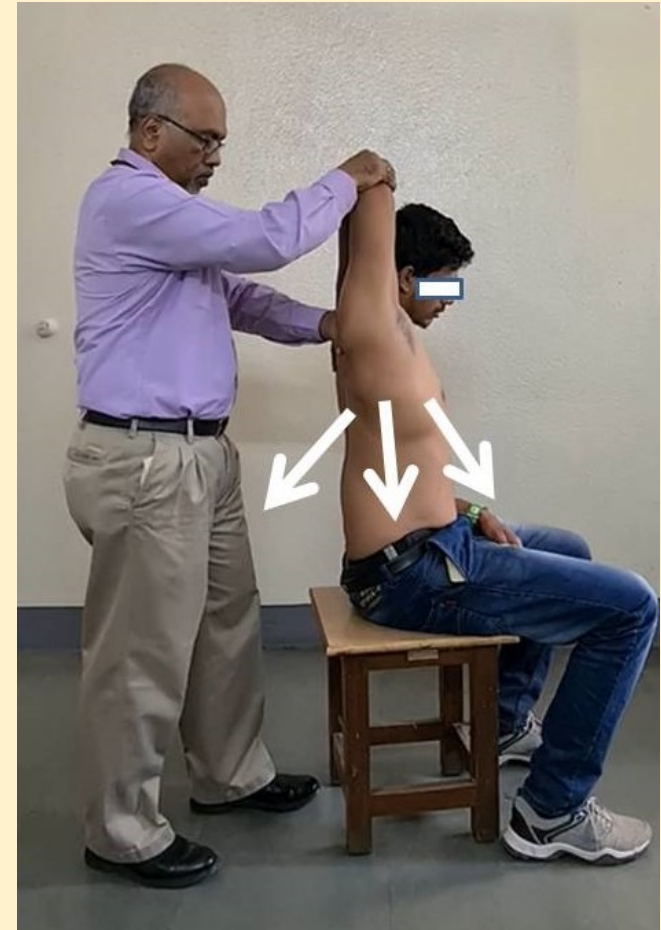
STEPS OF THE RK TEST : 2

- The examiner supports the patient's arm with one hand at the elbow and with the other hand, ipsilateral scapula of the patient is stabilized.
- The examiner then abducts the shoulder up to 170 - 180 degrees.
- Patient's shoulder should be held in this position for 30 seconds before performing any provocative maneuvers.



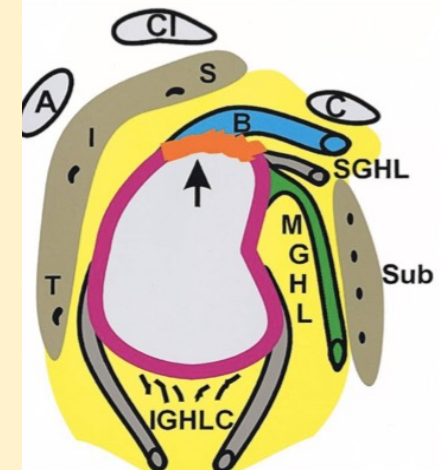
STEPS OF THE RK TEST : 3

- The examiner then performs provocative maneuver on the patient with the hand that was used to stabilize the arm.
- The glenoid is loaded posteriorly, inferiorly, and anteriorly in sequential manner.
- Test is considered as positive, if the patient experiences pain or has any apprehension about the symptoms.
- The observation of the test is recorded by the second examiner seated in front of the patient while performing the test.



RESULTS OF RK TEST

- 38 patients in the study - 26 Males : 12 Females
- RK test positive in 15 patients




SENSITIVITY	76.92 %
SPECIFICITY	84.61%
POSITIVE PREDICTIVE VALUE	83.33%
NEGATIVE PREDICTIVE VALUE	78.57%
POSITIVE LIKELIHOOD RATIO	4.94
NEGATIVE LIKELIHOOD RATIO	0.27

RESULTS OF RK TEST

Number of Patients	Positive MRI[Plain]	RK Test	MR Arthrogram positive	O'Brien's Test
15	5 (33.33%)	14 (93.33%)	14 (93.33%)	07(46.66%)

- Out of 15 patients tested positive for RK test - 12 patient underwent Arthroscopy
- Arthroscopy revealed to have Slap Tear in 10 patients (83.33%).
- 1 case Partial Cuff tear with Grade 2 Acromion / Other case of SSc tear with type 3 acromion

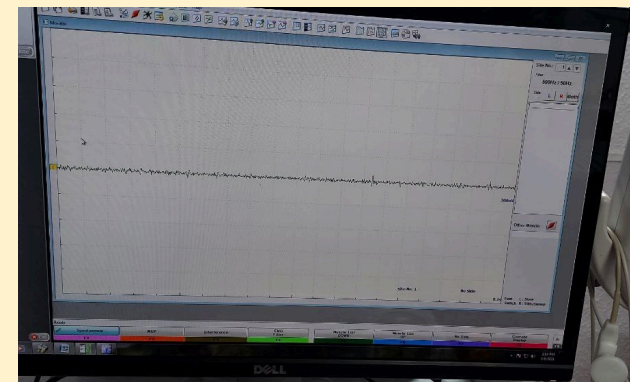
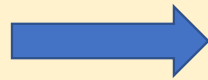
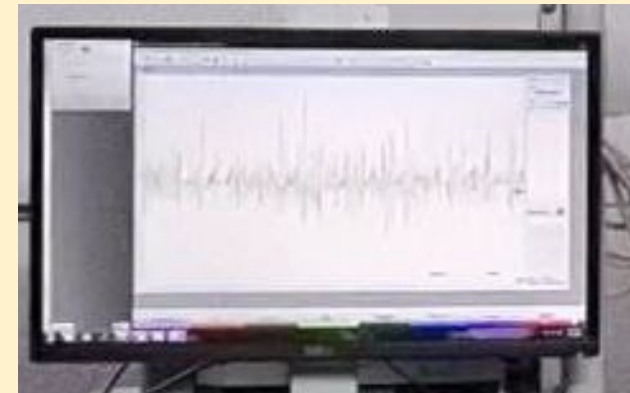
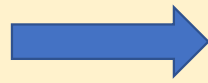
- Out of 10 patients who underwent arthroscopic SLAP repair 

TYPE OF SLAP TEAR	NUMBER OF PATIENTS
1	3
2	5
3	1
8	1

Comparing diagnostic accuracy of O'Brien's, Speed's and RK test

Test	Sensitivity	Specificity	Positive LR	Negative LR
O'Brien ⁽¹¹⁾	54	31	0.78	1.48
Speed's ⁽¹²⁾	32	75	1.28	0.91
RK	76.92	84.61	4.94	0.27

ENMG Study of the RK Test



Inference: Deltoid is not active at the time of the RK test.

WHY RK TEST ?

- RK test shows **better diagnostic accuracy** than existing clinical tests for SLAP
- Higher **sensitivity and specificity**
- Only test where **deltoid does not influence** test result
- Can identify direction of dislocation
- **Easily reproducible**, user-friendly, application in **OPD setting**

LIMITATIONS

- Can only be done if full ROM shoulder present
- Caution in hyperlax patients
- In patients with acromioclavicular joint arthritis or partial rotator cuff tear, the RK test can give false positive results.

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