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Title: *Arthroscopic PRP injected at repair site after labrum repair in unstable shoulders give improved structural and functional outcomes:*

A Case Control Study

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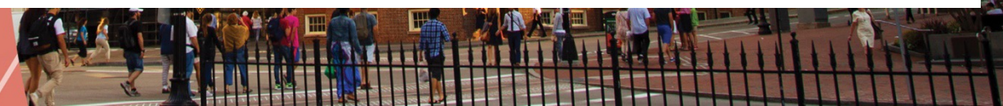
Disclosures: None



Aim: To study whether PRP accelerates healing in Bankart lesions and provides better functional outcome in recurrent shoulder dislocation patients

Rationale:

- Platelet-Rich Plasma (PRP) has been used extensively in RC repair but only 1 case report has been published using Platelet-Rich Plasma (PRP) and Bankart lesion.
- No clinical trial has been done using Platelet-Rich Plasma (PRP) in Bankart repair.
- Quality and strength of Labrum healing is essential for the success of arthroscopic bankart repair

Research question:

1. Whether the use of Platelet-Rich Plasma (PRP) in arthroscopic Bankart repair improves the rate and quality of labrum healing.
2. Does Platelet-Rich Plasma (PRP) Injection translate into better functional outcomes.

Study design

- Case-control study, performed at our tertiary care hospital.
- Sampling frame : 1 July 2019 to 31st December 2021.
- Approval : Institute's Ethical Committee (AIIMS/IEC/2019-20/975)

  Clinical Trials Registry- India (CTRI) (Reg.No CTRI/2020/08/027206)

Inclusion criteria:

1. Patients diagnosed with recurrent shoulder dislocation after clinical and radiological evaluation.
2. Traumatic shoulder dislocation
3. Operated with arthroscopic labral repair.

Exclusion criteria:

1. Recurrent shoulder dislocation patients who needed open surgery (e.g. latarjet procedure. Etc.)
2. Previous shoulder pathology or symptoms before shoulder dislocation.
3. Multidirectional shoulder dislocation
4. Generalized joint laxity
5. Any other pathology in shoulder or surrounding region that might affect the functional assessment of shoulder.

Study procedure and data collection methods:

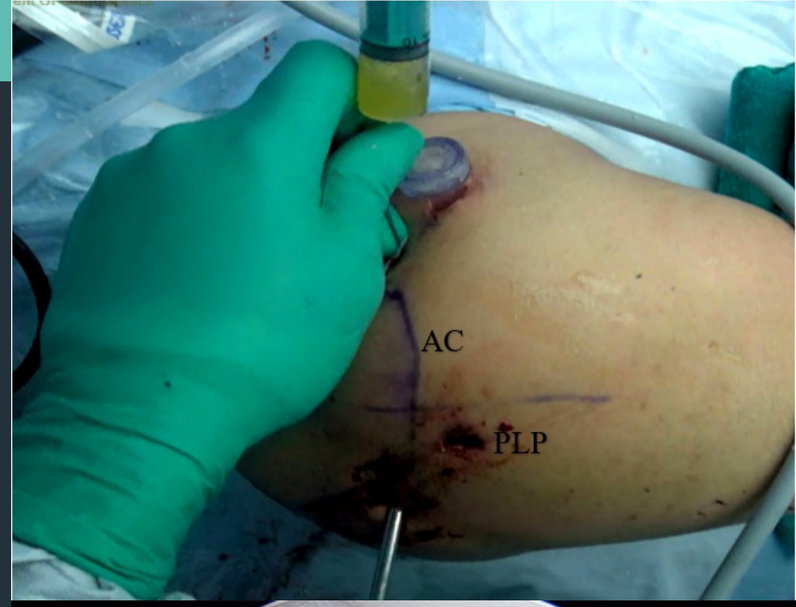
- Group 1 (cases): prospectively recruited patients of recurrent shoulder dislocation, who were operated arthroscopically *after* the start of study. They were administered the PRP injection.
- Group 2 (controls): retrospectively recruited patients of recurrent shoulder dislocation who were operated *before* the start of the study. They had not received the PRP injection.

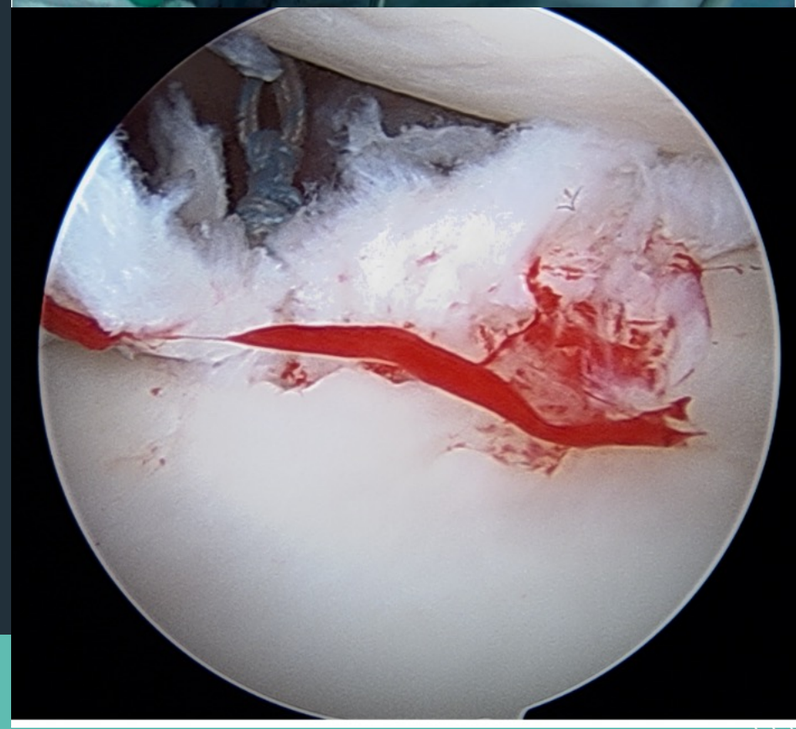
Preparation of platelet-rich plasma (PRP) and delivery techniques:

- On the day of hospital admission, 15-20 ml of autologous blood was withdrawn from group I patients in Anticoagulant Citrate Dextrose (ACD) solution tubes.
- Leukocyte Rich Platelet Rich Plasma (LR-PRP) was prepared using double spin method.

Surgical technique:

- Standard bankart repair was done arthroscopically using single threaded anchors (2.5mm, Arthrex, Naples FL).
- Adequacy of repair was checked with probing and adequate bump creation.
- **PRP was injected at the labrum-bone interface**, using a long spinal needle inserted through anterior portal.
- It was observed that there was no extravasation of the PRP into the joint from the injection site.

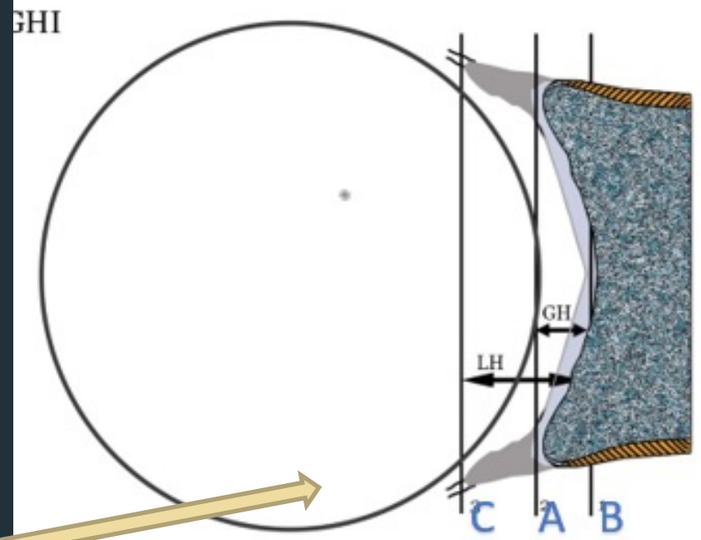


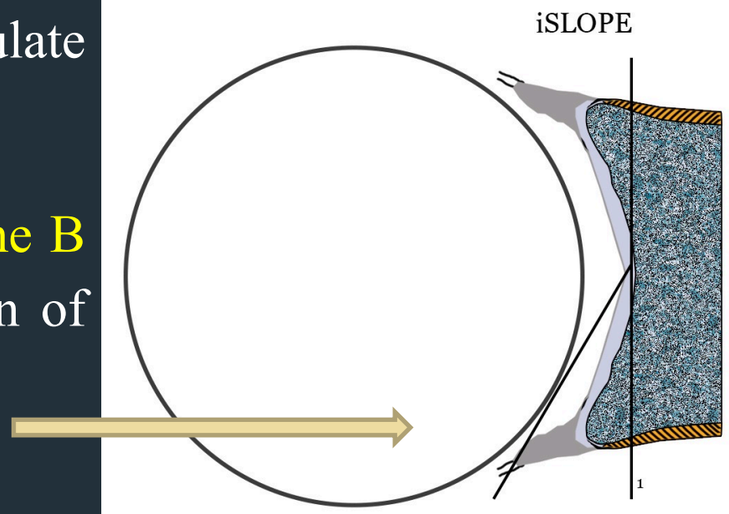


MRI evaluation: at 6 months

Labral morphology was assessed using following parameters:

1. Labral Height (LH): maximum height of capsulo-Labral complex from lowest portion of glenoid cavity. Perpendicular distance between line B and C.
2. Labrum glenoid height index (LGHI): Labral height divided by the glenoid height (perpendicular distance between lines B and A) was assessed to calculate LGHI.
3. Labral Slope: The Labral Slope was assessed as an acute angle between line B and line D i.e., from tip of maximum Labral height and the lowest portion of glenoid cavity (Figure 1b).





Stein T, et al. MRI assessment of the structural labrum integrity after Bankart repair using knotless bio-anchors. Knee Surg Sports Traumatol Arthrosc. 2011 Oct;19(10):1771–9.

RESULTS

- TOTAL 40 patients were included in this study: 20 in group I (cases) and 20 in group II (controls).
- Mean AGE : 26 ± 6 years.

  36 patients (90%) were MALE (19 in group II, 17 in group I)

  4 patients (10%) were FEMALE (1 in group II, 3 in group I)

- 25 had right side shoulder affected (62.5%) and 15 had left side shoulder involvement (37.5%)

Both the groups were comparable with no statistically significant difference in the age, gender and site distribution.

			Groups		Total	p-value
			PRP	Non PRP		
Age	≤ 20 yrs.	N (%)	3 (15%)	3 (15%)	6 (15%)	0.753 #
	21 - 30 yrs.	N (%)	11 (55%)	13 (65%)	24 (60%)	
	31 - 40 yrs.	N (%)	6 (30%)	4 (20%)	10 (25%)	
	Total	N (%)	20 (100%)	20 (100%)	40 (100%)	
Gender	Male	N (%)	17 (85%)	19 (95%)	36 (90%)	0.605 #
	Female	N (%)	3 (15%)	1 (5%)	4 (10%)	
	Total	N (%)	20 (100%)	20 (100%)	40 (100%)	
Side distribution	Right	N %	12 (60%)	13 (65%)	25 (62.5%)	1.000 #
	Left	N %	8 (40%)	7 (35%)	15 (37.5%)	
	Total	N %	20 (100%)	20 (100%)	40 (100%)	

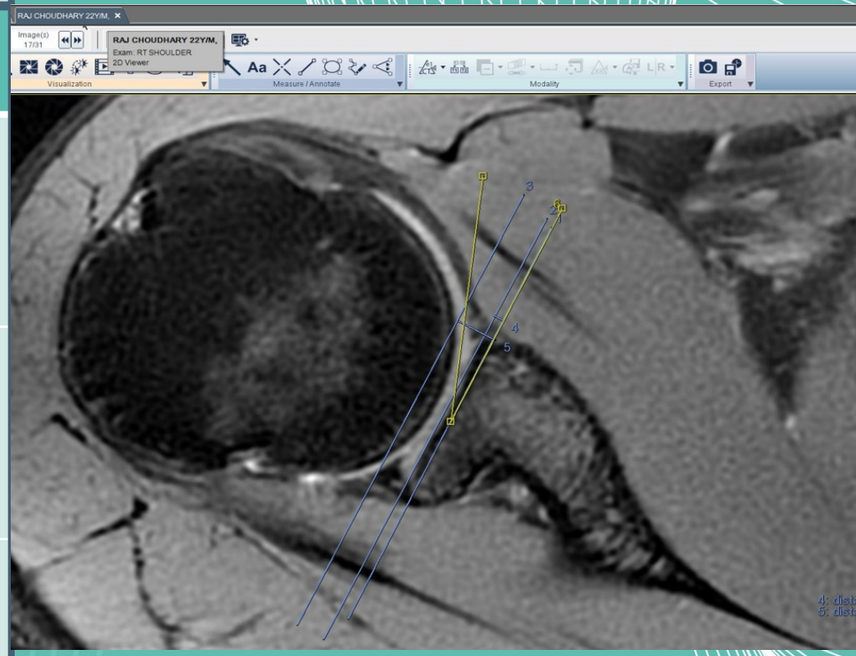
Score comparison **within** the groups at 6 months followup

Group	Scores	Time of assessment	Mean	Range	N	SD	p-value
Group 1 PRP	ASES	At presentation	56.10	51.0 -61.0	20	3.23	0.0005 **
		At 6 months	93.05	90.0-96.0	20	1.93	
	DASH	At presentation	50.80	47.0-58.0	20	3.40	0.0005 **
		At 6 months	15.71	8.9-19.0	20	1.56	
	CSS	At presentation	64.35	59.0-71.0	20	2.96	0.0005 **
		At 6 months	93.15	90.0-96.0	20	2.78	
Group II Non-PRP	ASES	At presentation	54.80	49.0-63.0	20	4.05	0.0005 **
		At 6 months	91.39	88.3-94.9	20	2.02	
	DASH	At presentation	51.01	46.0-47.5	20	4.01	0.0005 **
		At 6 months	11.60	8.9-14.2	20	1.54	
	CSS	At presentation	64.75	59.0-68.0	20	2.84	0.0005 **
		At 6 months	91.50	83.0-94.0	20	2.67	

Scores comparison **between** groups at 6 months FU	Group 1	Group 2	P value
ASES	93.1 ± 1.9	91.4 ± 2.0	0.011*
DASH	15.7 ± 1.6	11.6 ± 1.5	0.0005 **
CSS	93.2 ± 2.8	91.5 ± 2.7	0.063

MRI measurements	Groups	N	Mean	SD	p-value
Labrum Height	I (PRP)	20	10.55	2.09	0.001 *
	II (Non-PRP)	20	8.26	1.95	
LGHI	I (PRP)	20	4.06	0.85	0.311
	II (Non-PRP)	20	3.75	1.08	
Labrum slope	I (PRP)	20	30.80	5.63	0.025 *
	II (Non-PRP)	20	25.88	7.59	

*** Statistically Significant ($p < 0.05$). # No Statistical Significance ($p > 0.05$ level)**



CONCLUSION

The PRP injection at the labrum-bone interface of Bankart repair provides:

1. Better healing response in repaired labrum
2. Improved structural restoration of labrum as compared to controls
3. Better functional outcomes at 6 months

References

1. Stein T, Mehling AP, Reck C, Buckup J, Efe T, Hoffmann R, et al. MRI assessment of the structural labrum integrity after Bankart repair using knotless bio-anchors. Knee Surg Sports Traumatol Arthrosc. 2011 Oct;19(10):1771–9.
2. Vander Kraats R, Doss A. Glenoid Labral Tear: follow up case series on ultrasound Guided autologous platelet-rich plasma in conjunction with a progressive rehabilitation program.F1000Research. 2012;1:68.
3. Owens BD, Harrast JJ, Hurwitz SR, Thompson TL, Wolf JM. Surgical Trends in Bankart Repair: An Analysis of Data From the American Board of Orthopaedic Surgery Certification Examination. Am J Sports Med. 2011 Sep;39(9):1865–9.
4. Hovelius L, Rahme H. Primary anterior dislocation of the shoulder: long-term prognosis at the age of 40 years or younger. Knee Surg Sports Traumatol Arthrosc. 2016 Feb;24(2):330–42.