Efficacy Of Platelet-Rich Plasma Gel Augmentation And PRP Booster Injection For Rotator Cuff Repair – A Randomized Controlled Study

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Vineet Thomas Abraham MBBS, MS(Orth), Presenter

Pratik Talwar MBBS,

All India Institute of Medical Sciences, Mangalagiri, Guntur, Andhra Pradesh, India

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Faculty Disclosure Information

- **WE DO NOT** have a financial interest or other relationship with a commercial company or institution.

Background

- Rotator cuff surgery is a very commonly done procedure, but there is a high incidence of retear following surgical repair making this procedure challenging.[1]
- Among the various available Orthobiologics, Platelet Rich Plasma(PRP) is readily available and is being widely used.
- PRP in rotator cuff repair has shown mixed results because of lack of standardisation and a varied application protocol from study to study. The principal factors limiting our understanding of PRP and its clinical efficacy is heterogeneity. [2]

Background

- Researchers have used different application methods during surgery, with some surgeons applying the liquid PRP over the repair site or interposing PRP gel between tendon and bone.[3,4]

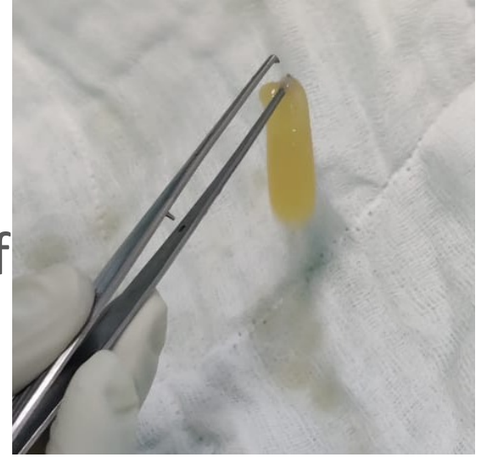
- This study evaluates the functional outcome and pain reduction in patients who underwent rotator cuff repair with PRP gel augmentation during the repair followed by booster injections versus conventional rotator cuff repair without PRP augmentation.

Methodology

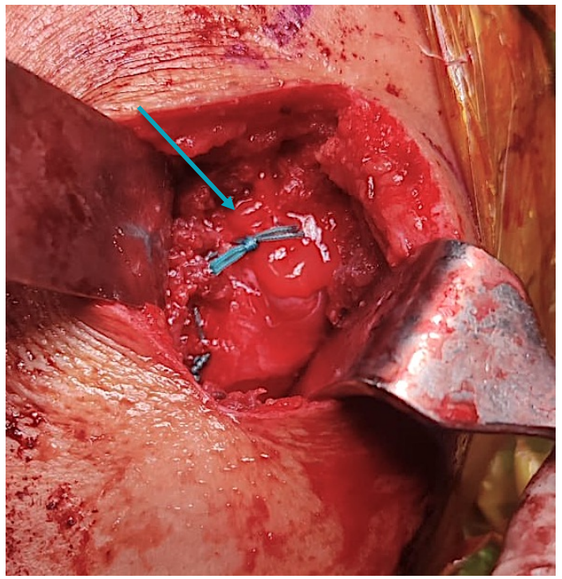
- A randomized control study was conducted in which 36 patients diagnosed with rotator cuff tear were included as per the inclusion criteria.
- The patients were randomized into 2 groups, 1st group received no PRP, the 2nd group received PRP gel during surgery followed by PRP booster injections on the 12th and 28th day follow up.
- The PRP gel was prepared by first using double-spin centrifugation, 9 mL of the extracted PRP was then mixed with 0.9 mL of 10% calcium gluconate loaded in a 5-ml syringe and this was used to produce a PRP gel.

Methodology

- Intraoperatively after arthroscopic/mini-open rotator cuff repair, PRP gel was applied over the repaired cuff near the bone tendon interface.
- Liquid PRP was further given on the 12th and 28th day in the PRP group.
- Pain was assessed using VAS scale preoperatively and at postoperative days 12, 28, and 90
- Functional outcome was assessed using ASES score and Constant and Murley score preoperatively and at 3, 6 month follow-up.



PRP Gel



Arrow showing PRP gel placed on to the repaired cuff in mini open transosseous rotator cuff repair

Results

	Non PRP	PRP
No of patients	18	18
Avg time since injury (months)	4.7	6.5
Diabetes	14	13
Pre op VAS score	4.78	5.61
Pre op Constant score	37.88	41.83
Pre op ASES Score	40.94	42.33

- Most of the patients were either Snyder 3 or 4.
- The Goutallier staging was also similar in both groups.

Pre op Constant Murley, ASES and VAS scores were similar in both groups no statistical difference

VAS score

PRP/Non PRP		N	Mean	Std. Deviation	P Value
12 th day VAS	Non PRP	13	4.08	2.139	0.009
	PRP	15	2.00	1.773	
4th week VAS	Non PRP	13	2.92	1.382	0.042
	PRP	14	1.64	1.692	
6th week VAS	Non PRP	13	2.31	1.032	0.049
	PRP	12	1.33	1.303	
3rd month VAS	Non PRP	13	1.38	1.387	0.652
	PRP	10	1.10	1.595	

- Pain score (VAS) was better in the PRP group on the 12th day, 4th week and 6th week and this was statistically significant.
- By the 3rd month the VAS scores were similar in both groups

Results

PRP/Non PRP		N	Mean	Std. Deviation	P Value
3ra month ASES	Non PRP	12	73.00	12.128	0.472
	PRP	10	76.70	11.383	
3rd month Constant and Murley	Non PRP	12	59.83	16.078	0.948
	PRP	10	59.40	14.377	
6th month ASES	Non PRP	8	87.88	8.357	0.927
	PRP	3	87.33	8.963	
6th month Constant and Murley	Non PRP	8	78.63	7.726	0.118
	PRP	3	67.67	13.650	

- Functional outcome as assessed by the ASES and Constant and Murley score was similar in both groups at both the 3rd month and the 6th month follow up.

Discussion

- Previous studies have reported better post op VAS scores, but similar functional outcomes in patients treated with PRP compared to control.[4,5] In our study we had better VAS scores on 12th day, 4th week and 6th week in the PRP group. Functional outcome was similar in both groups in our study too.

- Previous studies have also reported better healing rates in tears < 2 cm and lower retear rate in patients treated with PRP compared to controls.[4,5] In our study the follow up was only 6 months, we need to follow up the patients for a longer period to look for difference in retear rate and healing of rotator cuff.

Discussion

- In a study done by Jo CH et al they found that PRP gel application to arthroscopic rotator cuff repairs did not accelerate recovery with respect to pain, ROM, strength, functional scores, or overall satisfaction as compared with conventional repair at any time point.[6]
- In the same study, MRI demonstrated a lower retear rate of 26.7% in the PRP group compared to 41.2% in the conventional group, there was no statistical significance between the groups (P = .388).[6]
- A systematic review showed there was significantly lower retear rates than arthroscopic repair alone but the improvement of Constant–Murley, UCLA, and SST scores is lower than the minimal clinically important difference.[7]

- The role of PRP in rotator cuff repair is still controversial with some studies reporting benefit in pain and healing rates and some reporting no difference.

Conclusion

- PRP augmentation of rotator cuff repair is beneficial for reducing pain in the initial post operative period.
- There was no benefit in the functional outcome as both the ASES score and Constant Murley scores were similar.
- Larger randomized control studies, powered for healing rate, are necessary to further determine the effect and benefits of PRP.

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