

**A PROSPECTIVE OBSERVATIONAL STUDY OF FUNCTIONAL
OUTCOME OF ARTHROSCOPIC DEBRIDEMENT,
MICROFRACTURING AND AUGMENTATION USING
LEUCOCYTE POOR PLATELET RICH PLASMA THERAPY
FOR PATIENTS WITH GRADE IV OSTEOCHONDRAL DEFECT
IN RURAL POPULATION**

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NO DISCLOSURES

BACKGROUND:

- Microfracture is the most common first-line option for the treatment of small chondral lesions, although increasing evidence shows that the clinical benefit of microfracture decreases over time. Platelet-rich plasma (PRP) has been suggested as an effective biological augmentation to improve clinical outcomes after microfracture.
- Microfracture leads to tissue repair with fibrocartilage, Fibrocartilage presents low resistance to compression, elasticity, and wear compared with hyaline cartilage(1).
- Current research is also focusing on the optimization of microfracture by use of biological augmentation with platelet-rich plasma (PRP) to facilitate proliferation and chondrogenic differentiation and, in the end, improve repair tissue quality.
- The increased quality of the repair tissue was confirmed by Hapa et al,(2) who used a rat chronic focal chondral defect model and found that PRP augmentation of microfracture resulted in better cartilage healing with increased type II collagen expression compared with microfracture alone.

OBJECTIVE:

- The aim of this study was to evaluate the clinical evidence for this biological approach by analyzing application of LP-PRP, documenting safety and efficacy of this augmentation technique to improve microfracture for the treatment of cartilage lesions in rural population.

MATERIALS AND METHODS:

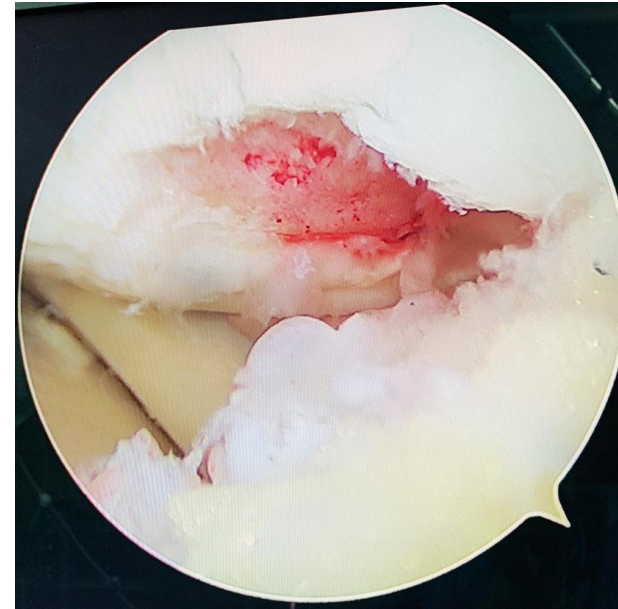
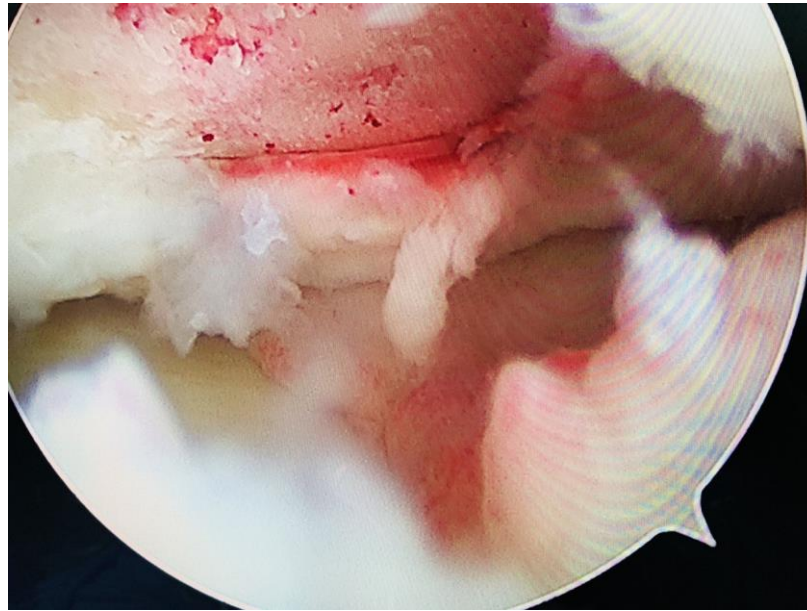
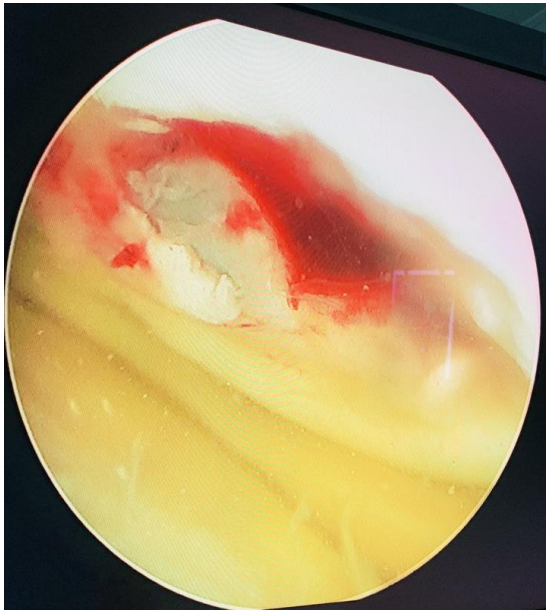
- We prospectively followed 15 patients who fulfilled the inclusion criteria with defect size of the lesion was $< 2 \text{ cm}^2$, Femoral condyle defect were included to the study.
- The study involved male or female patients with ACL injury in the Left or Right knee joint with grade IV Osteochondral defect.
- All the patients were subjected to standard Arthroscopic ACL Reconstruction using Semi-T and Gracilise graft which was fixed proximally by adjustable loop endo-button and distally by Bio-screw, Debridement of the osteochondral defect and Micro-fracturing of the defect.

- Standard Rehabilitation protocol followed and non-weight bearing Gradual range of movement exercises followed,
- One-month post-surgery 2 episodes of LP-PRP given intra-articular by an interval of 15 days.
- LP-PRP Prepared using Customized PRP Kit Prepared by Ourselves. We collect 42 ml of venous blood through ACD Vacutainer tube and subjected to double centrifugation and collect the final 10 ml of PRP.

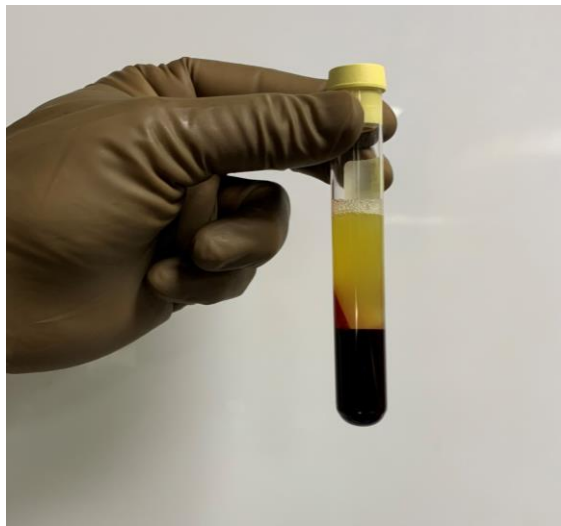
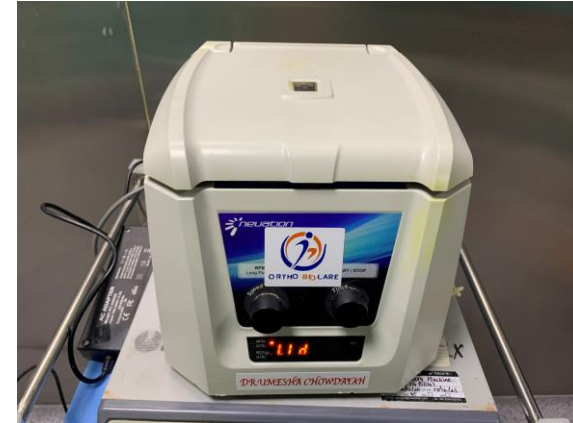
- Under All Aseptic Precautions Knee Joint Scrubbed Painted and Draped. Around 1.5 ml of Plane 2 % Xylocaine injected to the Standard Lateral Scopy Portal site (Soft part). 10 ml of LP-PRP Injected to Knee joint, Cycling done, sterile Dressing and Compression bandage applied.
- Functional assessment was observed by VAS and WOMAC, during 1st month, 2nd month, 6th month, 1st year and 2nd year.
- At the end of 6 months post-surgery MRI advised to assess the healing of cartilage.

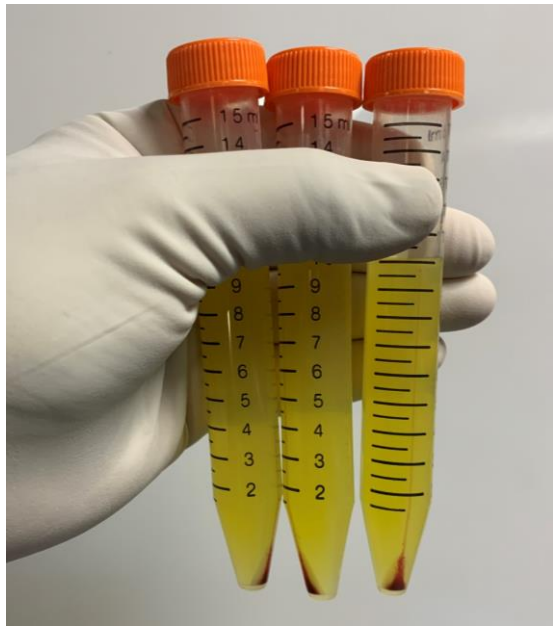
Case:

- 30 year old male with H/o Twisting injury Right knee complete ACL tear with locking episode. Mmedial femoral condyle articular cartilage defect.

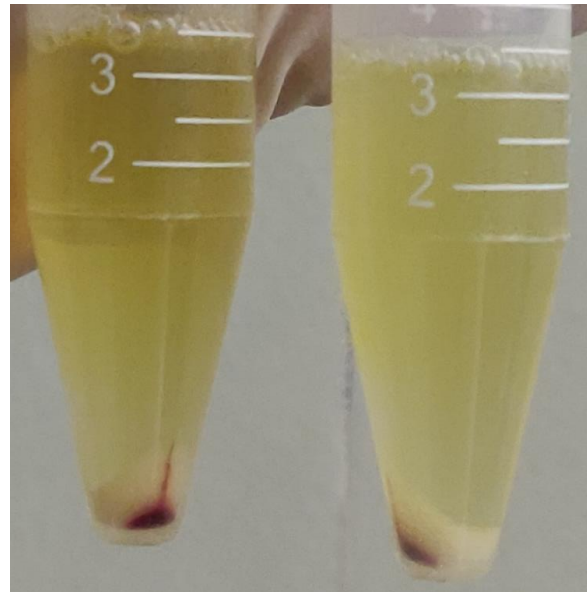


Customised PRP Preparation





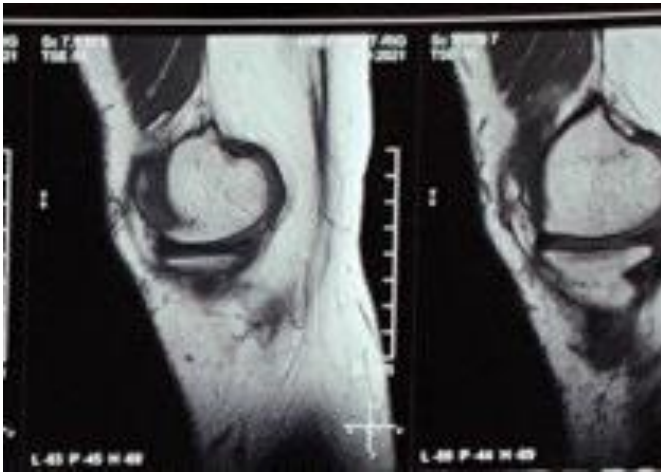
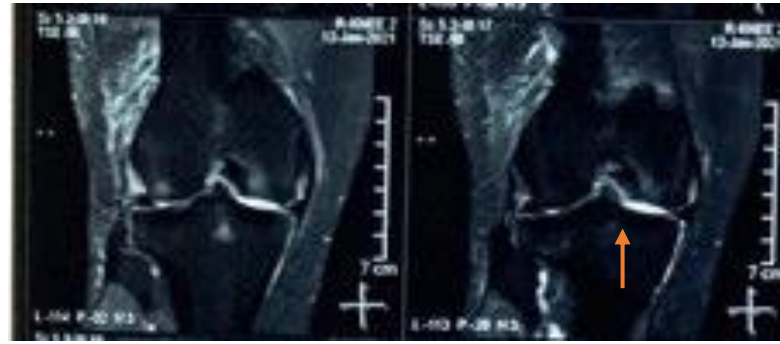
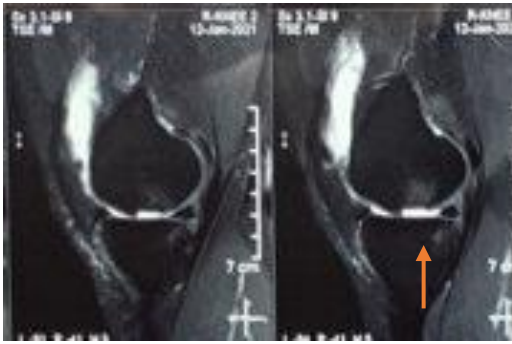
Leucocyte poor PRP



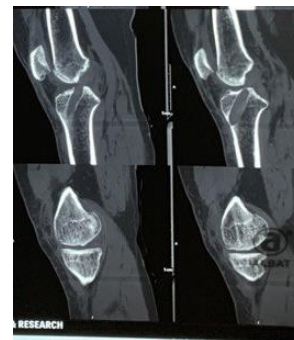
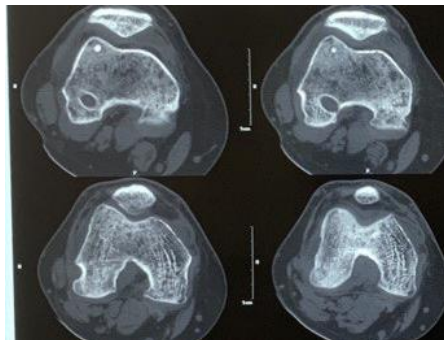
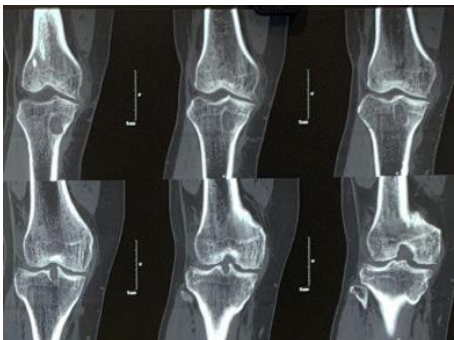
ID.	P	MARUTHI DIAGNOST	
Date	02/01/2019	ICS CENTRE	
Time	17:44	MANDYA	
Mode	WB	operator	
WBC	11.4 $\times 10^9/\mu\text{L}$	ID.	PR
RBC	5.03 $\times 10^6/\mu\text{L}$	Date	02/01/2019
HGB	13.2 g/dL	Time	18:20
HCT	41.4 %	Mode	WB
MCV	82.3 fL	WBC	6.4 $\times 10^9/\mu\text{L}$
MCH	26.2 pg	RBC	0.10 $\times 10^6/\mu\text{L}$
MCHC	31.9 g/dL	HGB	0.2 g/dL
PLT	AG* 431 $\times 10^3/\mu\text{L}$	HCT	0.6 %
LYM%	34.3 %	MCV	---- fL
MXD%	9.2 %	MCH	---- pg
NEUT%	56.5 %	MCHC	---- g/dL
LYM#	3.9 $\times 10^9/\mu\text{L}$	PLT	AG1 1969 $\times 10^3/\mu\text{L}$
MXD#	1.0 $\times 10^9/\mu\text{L}$	LYM%	+ 55.9 %
NEUT#	6.5 $\times 10^9/\mu\text{L}$	MXD% T2	---- %
RDW-SD	39.8 fL	NEUT% T2	---- %
RDW-CV	12.5 %	LYM#	3.6 $\times 10^9/\mu\text{L}$
PDW	9.9 fL	MXD# T2	---- $\times 10^9/\mu\text{L}$
MPV	8.5 fL	NEUT# T2	---- $\times 10^9/\mu\text{L}$
P-LCR	13.2 %	RDW-SD	---- fL
PCT	* 0.37 %	RDW-CV	---- %
ResearchM	11,439 $\times 10^3/\mu\text{L}$	PDW	10.1 fL
		MPV	8.6 fL
		P-LCR	14.2 %

WBC	9.7 $\times 10^9/\mu\text{L}$	Mode	WB
RBC	5.23 $\times 10^6/\mu\text{L}$	WBC	3.5 $\times 10^9/\mu\text{L}$
HGB	15.0 g/dL	RBC	! 0.09 $\times 10^6/\mu\text{L}$
HCT	45.6 %	HGB	! 0.0 g/dL
MCV	87.2 fL	HCT	! 0.4 %
MCH	28.7 pg	MCV	---- fL
MCHC	32.9 g/dL	MCH	---- pg
PLT	365 $\times 10^3/\mu\text{L}$	MCHC	---- g/dL
		PLT	! 1279 $\times 10^3/\mu\text{L}$
LYM%	35.4 %	LYM%	+ 70.8 %
MXD% T2	---- %	MXD% T2	---- %
NEUT% T2	---- %	NEUT% T2	---- %
LYM#	3.4 $\times 10^9/\mu\text{L}$	LYM#	2.5 $\times 10^9/\mu\text{L}$
MXD# T2	---- $\times 10^9/\mu\text{L}$	MXD# T2	---- $\times 10^9/\mu\text{L}$
NEUT# T2	---- $\times 10^9/\mu\text{L}$	NEUT# T2	---- $\times 10^9/\mu\text{L}$
RDW-SD	47.8 fL	RDW-SD	---- fL
RDW-CV	13.7 %	RDW-CV	---- %
PDW	10.0 fL	PDW	10.4 fL
MPV	8.6 fL	MPV	8.6 fL
P-LCR	15.1 %	P-LCR	17.2 %
PCT	0.31 %	PCT	+ 1.10 %
ResearchW	9,661 $\times 10^3/\mu\text{L}$	ResearchW	3,482 $\times 10^3/\mu\text{L}$
ResearchS	3,434 $\times 10^3/\mu\text{L}$	ResearchS	2,478 $\times 10^3/\mu\text{L}$
ResearchM	---- $\times 10^3/\mu\text{L}$	ResearchM	---- $\times 10^3/\mu\text{L}$
ResearchL	---- $\times 10^3/\mu\text{L}$	ResearchL	---- $\times 10^3/\mu\text{L}$

Pre and Post Op MRI



POST OP 6 MONTHS AND POST PRP 5 MONTHS CT



Results:

- The VAS score reflected highly significant improvement in the pain of the knee and functional outcome was assessed by WOMAC index with a significant p value, it was noted that when the pre-procedure VAS score (mean VAS score 9.1) was compared with the score of most recent follow up (mean VAS score 1.2) shows a significant improvement in pain significant p value (<0.001), MRI shows healed cartilage post-surgery.

CONCLUSION

ARTHROSCOPIC DEBRIDEMENT, MICROFRACTURING AND AUGMENTATION USING LEUCOCYTE POOR PLATELET RICH PLASMA THERAPY FOR PATIENTS WITH GRADE IV OSTEOCHONDRAL DEFECT IMPROVE THE CLINICAL RESULTS AND PROVIDES BETTER FUNCTIONAL OUTCOME AT SHORT TERM FOLLOW-UP

REFERENCES:

1. Nehrer S, Spector M, Minas T. Histologic analysis of tissue after failed cartilage repair procedures. Clin Orthop Relat Res. 1999;365: 149-162.
2. Hapa O, Cakici H, Yuksel HY, Firat T, Kucukner A, Aygun H. Does platelet-rich plasma enhance microfracture treatment for chronic focal chondral defects? An in-vivo study performed in a rat model. Acta Orthop Traumatol Turc. 2013;47(3):201-207.