

Investigation of the relationship between responder rate to Leucocyte-poor platelet rich plasma (LP-PRP) therapy and %Mechanical Axis(%MA) in patients with medial type knee osteoarthritis (KOA)

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C O I Disclosure

Presenter: Ryosuke Nakajima

I DO NOT have a financial interest or other relationship with a commercial company or institution

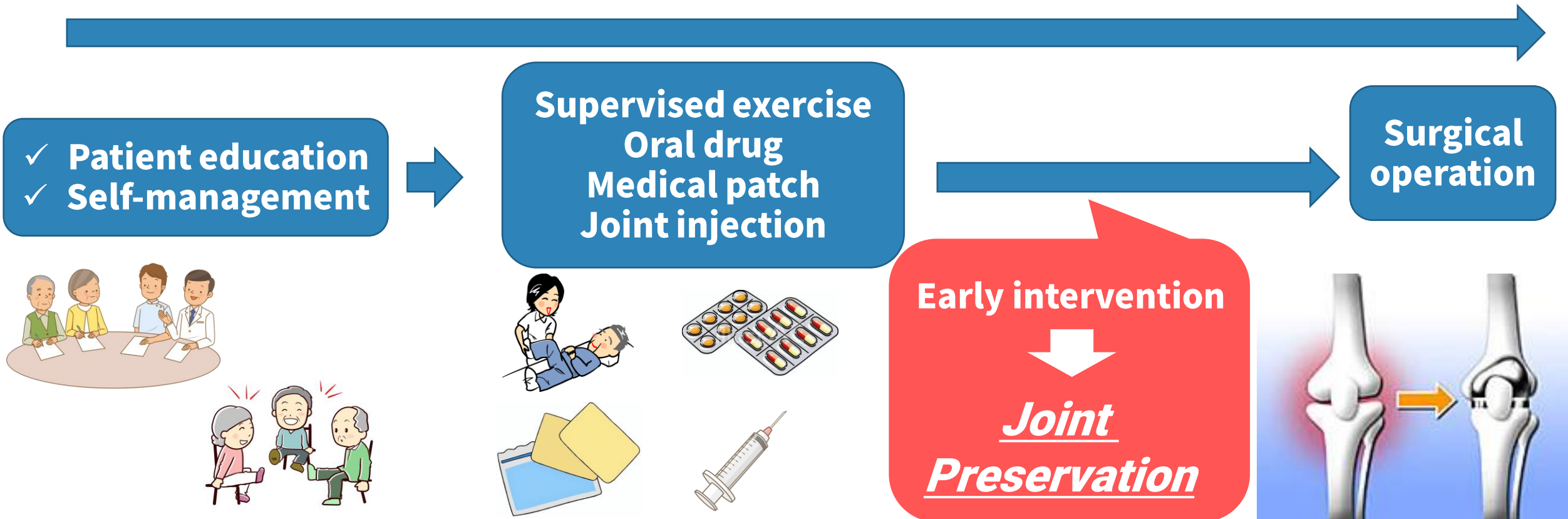
Background

- ✓ Knee osteoarthritis is one of the most common degenerative diseases causing disability in elderly patients

Management of Knee osteoarthritis (KOA)

Early KOA

Severe OA



Outpatient



Will PRP therapy
work for me?
Do I need surgery?

For joint preservation



Surgical treatment

Osteotomy

or, and

Biotherapy (PRP etc.,)

Conservative treatment

Even when surgical or conservative therapy is proposed for KOA, surgical therapy is often rejected

✓ Clinical Question



Does PRP work independent of lower limb malalignment?



✓ Purpose

To investigate the effect of lower extremity alignment on the efficacy of PRP for KOA

Participants



✓ **Varus KOA** (%MA < 50%, mean %MA : 28.3% ± 11.8(SD))
Underwent PRP therapy (3 times each one month)



✓ **Collected PROMs:** VAS, KOOS(pre-treatment(VAS ≥ 30))
and 6 months post treatment

✓ **KL1/2/3/4 :** (2/13/15/13 patients)



✓ **Number:** 37 patients 43 knees



✓ **Sex:** male/female (17/20patients)



Evaluations and statistical analysis

Investigating the relationship between efficacy of PRP-therapy and %MA

- ✓ **Relationship between responder rate at 6 months post-treatment and %MA :**
 - ➔ **ROC curve**

- ✓ **Correlation between femorotibial angle (FTA) and %MA:**
 - ➔ **Pearson's correlation coefficient**

(SPSS ver.27)



Result (responder rate from PROMs)

✓ OMERACT-OARSI responder criteria

High improvement in pain or in function $\geq 50\%$
and absolute change ≥ 20

Yes
↓
Response

No
↓

- VAS:20% • absolute change ≥ 10
- KOOS-ADL:20% • absolute change ≥ 10
- KOOS-QOL:20% • absolute change ≥ 10

VAS:50% • absolute change ≥ 20

Improvement in at least 2 of the 3 following:

- pain $\geq 20\%$ and absolute change ≥ 10
- function $\geq 20\%$ and absolute change ≥ 10
- patient's global assessment $\geq 20\%$ and absolute change ≥ 10

Yes
↓
Response

No
↓
No Response

(T. Pham et al Osteoarthritis and Cartilage Vol. 12, No. 5 393)

The responder rate (RR) at 6 months after PRP : **58.1%**

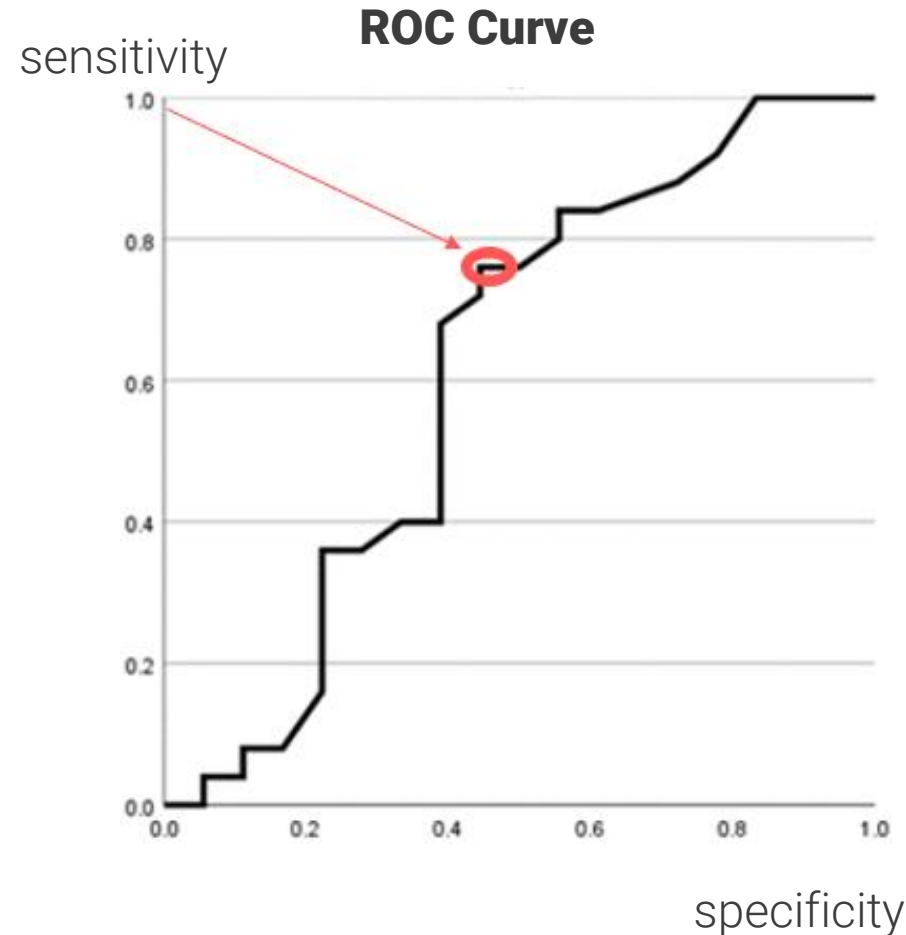
%MA of responder: 30.5%

>

%MA of non-responder: 25.3%

P=0.1, student t-test

Cut-off value of %MA to predict PRP-therapy efficacy



✓ %MA cut off for PRP therapy :

25.9%

(sensitivity 76% specificity 56%, AUC=0.613)

✓ Responder-rate :

<%MA 25.9% → **33.3%**

≥%MA 25.9% → **71.4%**

The predicted FTA 180.3° (%MA 25.9%)

FTA and %MA were correlated ($r=0.77, p<0.001$)

Discussion: *severity of KOA and efficacy of PRP*

	■ Non-responder	■ Responder	Responder rate
KL4 (6M)	105	111	51.3 %
KL4 (12M)	106	110	50.9 %
KL3 (6M)	58	118	67.0 %
KL3(12M)	59	117	66.5 %
KL2 (6M)	35	90	72.0 %
KL2 (12M)	31	94	75.2 %

The overall responder rate 62.1%
The responder rate was significantly higher in patients with mild to moderate KOA (KL2,3) than in those with severe KOA (KL4)

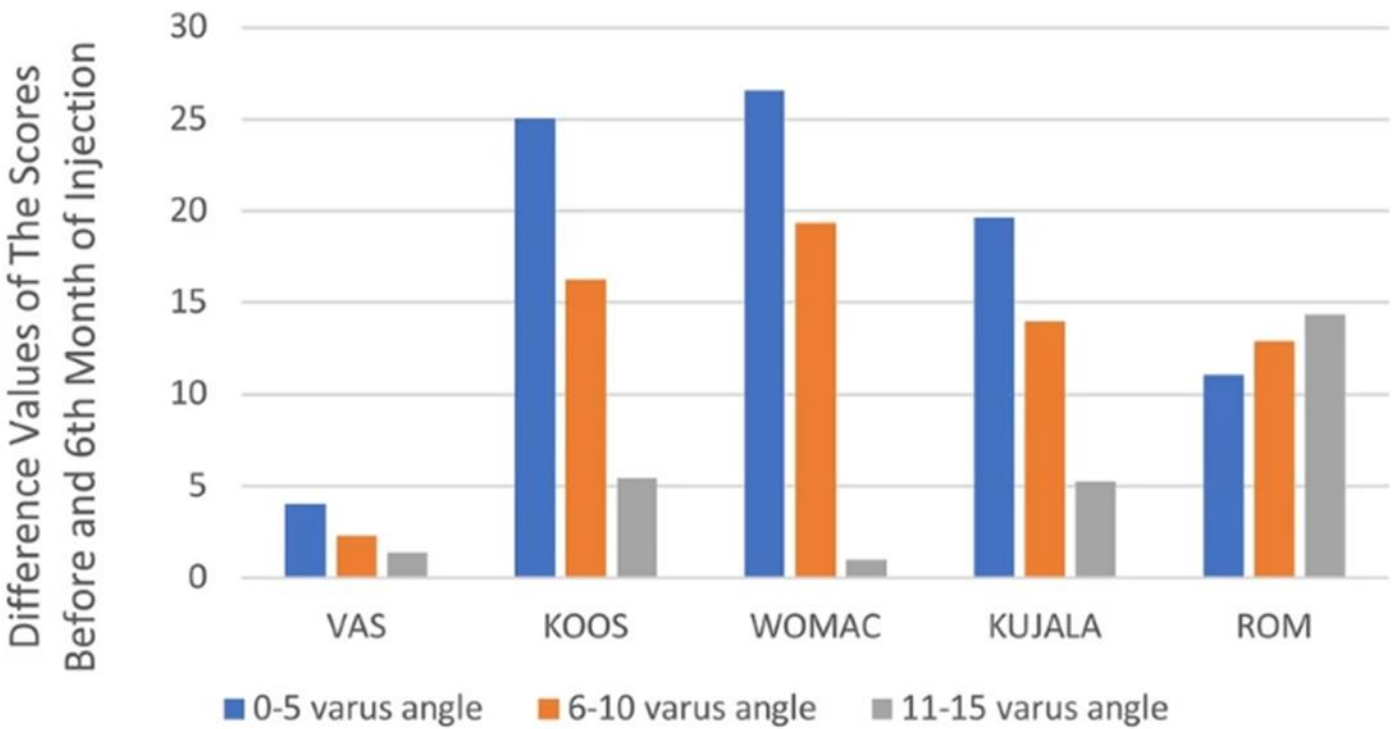
(Saita et al J. Clin. Med. 2021, 10, 4514)

The current study also has a responder rate of 58.1%, which is not significantly different from previous studies



Discussion: *lower-limb alignment and efficacy of PRP*

Mechanical Axis Angle and Scores Relationship



At 6 months after PRP therapy as MAA increased Improvement of various clinical scores are less likely to improve

Yurtbay A et al. Arch Orthop Trauma Surg. 2021



Discussion: *lower-limb alignment and efficacy of PRP*

✓ FTA and responder-rate in KL grade4 KOA

Table 3. Femorotibial angle and responder rate in severe (KL grade 4) knee osteoarthritis

Femorotibial angle, degrees	Responder rate (responders/number of patients)
<175	12/20 (60.0%, 36.5-83.5)
175–179	18/21 (85.7%, 69.4-102.0)
180–184	39/78 (50.0%, 38.7-61.3)
185–189	32/65 (49.2%, 36.7-61.7)
≥190	9/32 (28.1%, 11.7-44.6)

Decreased responder rate with FTA >180° (↓ ↓ FTA >190°)

(Saita et al J. Clin. Med. 2021, 10, 4514)

✓ The result of this study

✓ Responder-rate :

<°MA 25.9% → **33.3%**

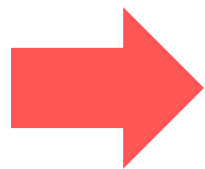
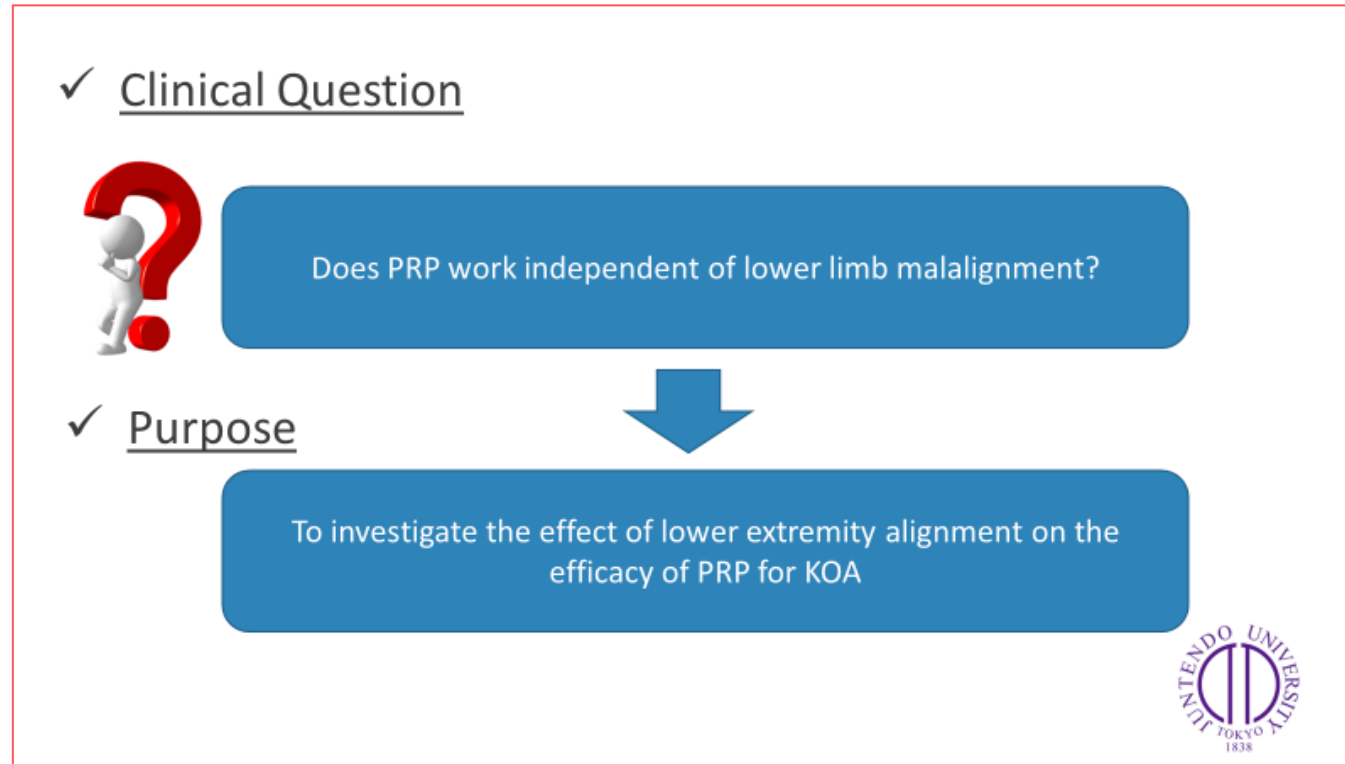
≥°MA 25.9% → **71.4%**

FTA and %MA were correlated
(r=0.77, p<0.001)

The predicted FTA **180.3°**
(%MA 25.9%)

Varus KOA than **25.9%** %MA (FTA 180.3°) predict **poor outcome** of PRP therapy
⇒ **recommend to consider knee alignment correction (osteotomy)**

Conclusion



**Varus deformity greater than 25.9% %MA (FTA 180.3°)
associated with poor outcome of PRP therapy**