Does coronal knee and ankle alignment affect recurrence of the varus deformity after high tibial osteotomy?

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I have no financial conflicts to disclose.

Introduction

- ❖ Open wedge high tibial osteotomy (OWHTO)
  - ➢ Changing knee alignment from varus to valgus, excessive medial load is shifted to the lateral compartment.

- ❖ Varus deformity sometimes recurs after OWHTO
  - ➢ Other various factors that might affect operation results.
  - ➢ Coronal alignment of the knee has been evaluated.

- ❖ Little is known of the interaction between the factors and changes of mechanical axis in lower extremity and how those factors affect recurrence.

Cantin KSSTA 2015, Badhe KSSTA 2002
Noyes AJSM 2000 , Knee 2008, KSSTA 2015

The purpose of this study

- To evaluate changes in the coronal alignment of the knee and ankle joints after OWHTO.

- To evaluate which factors are related to the recurrence of the varus deformity by serial analysis.

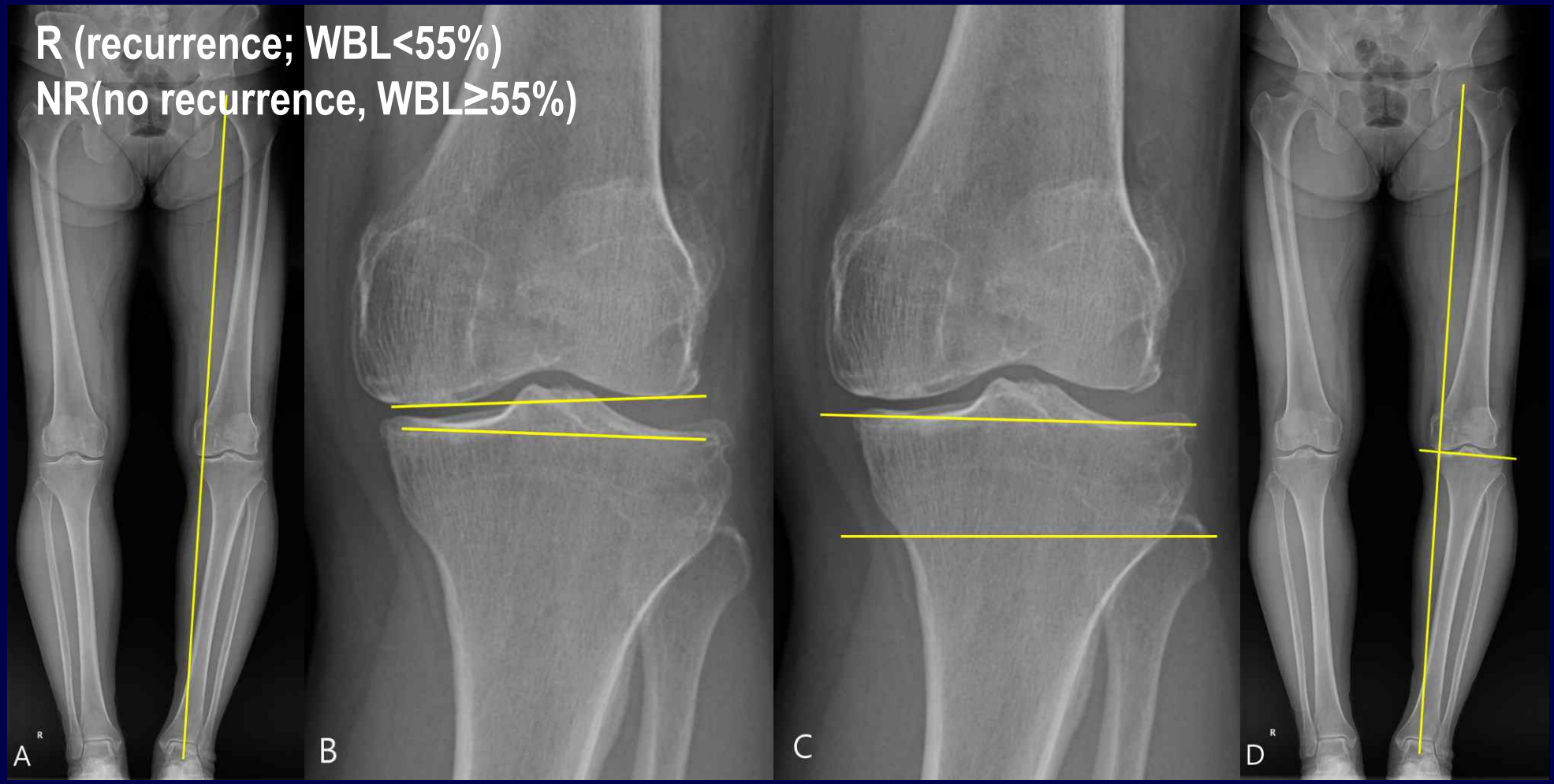
Demographics

- From March 2014 to December 2014, a total of 58 consecutive lower limbs (58 patients comprised 12 males and 46 female, mean age of 57 ± 5.7 years) that received biplanar OWHTO.

- Inclusion criteria
  - Varus medial compartment osteoarthritis
  - Relatively active patients aged less than 70 years
  - Mild patellofemoral arthritis

- Exclusion criteria
  - Double osteotomy
  - High tibial osteotomy for correction of the different pattern of the deformity

Evaluations



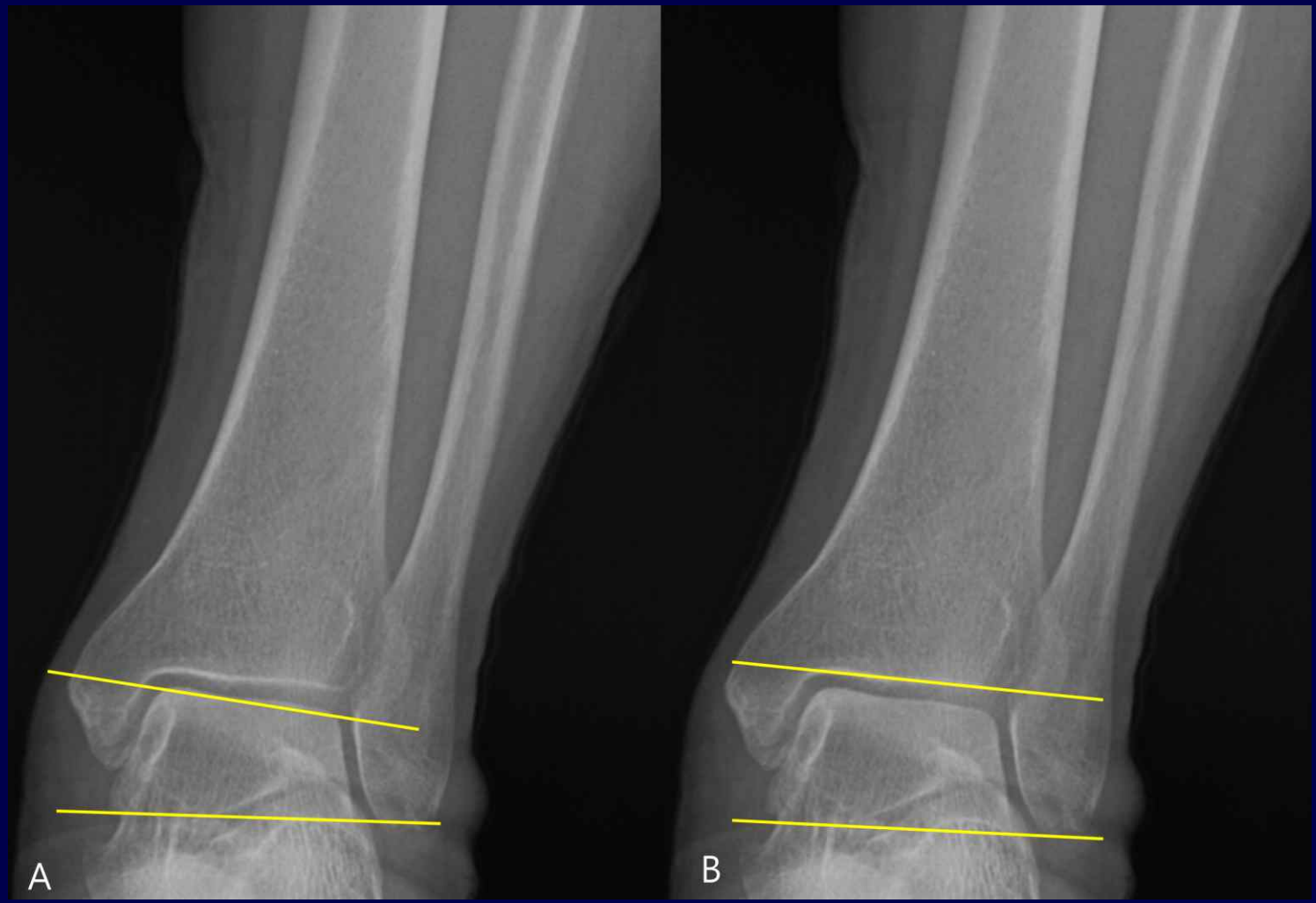
WBL (weight bearing line)

JLCA (joint line convergence angle

KI (knee joint inclination

MA-TP (mechanical axis-tibial plateau)

Evaluations



TI (talar inclination)

DTAA (distal tibia articular angle)

Results

Correlation analysis between WBL and other parameters

		Preoperative	Immediate postoperative	Postoperative 3 months	Postoperative 6 months	Postoperative 1 year
JLCA	Mean(SD)	2.17(1.48)	1.91(1.76)	1.93(1.83)	1.94(1.74)	1.91(1.95)
	Pearson correlation coefficient	-0.49	-0.33	-0.35	-0.34	-0.44
	Significant probability	0.01	0.01	0.01	0.01	0.01
KI	Mean(SD)	1.24(1.85)	2.65(2.71)	3.03(2.83)	3.34(2.77)	3.46(2.73)
	Pearson correlation coefficient	-0.22	0.21	0.06	0.18	0.21
	Significant probability	0.01	0.12	0.65	0.21	0.13
MA-TP	Mean(SD)	88.67(2.61)	91.26(2.17)	90.96(2.54)	91.14(2.45)	91.17 (2.18)
	Pearson correlation coefficient	-0.06	0.27	0.31	0.04	0.15
	Significant probability	0.68	0.04	0.02	0.79	0.28
TI	Mean(SD)	5.91(4.25)	-1.44(3.89)	0.64(4.39)	0.81(4.36)	1.11(4.27)
	Pearson correlation coefficient	-0.43	-0.26	-0.4	-0.61	-0.52
	Significant probability	0.01	0.05	0.01	0.01	0.01
DTAA	Mean(SD)	4.81(3.59)	-1.68(3.42)	-0.75(3.51)	0.31(3.64)	0.67(3.34)
	Pearson correlation coefficient	-0.35	-0.28	-0.45	-0.61	-0.52
	Significant probability	0.01	0.04	0.01	0.01	0.01

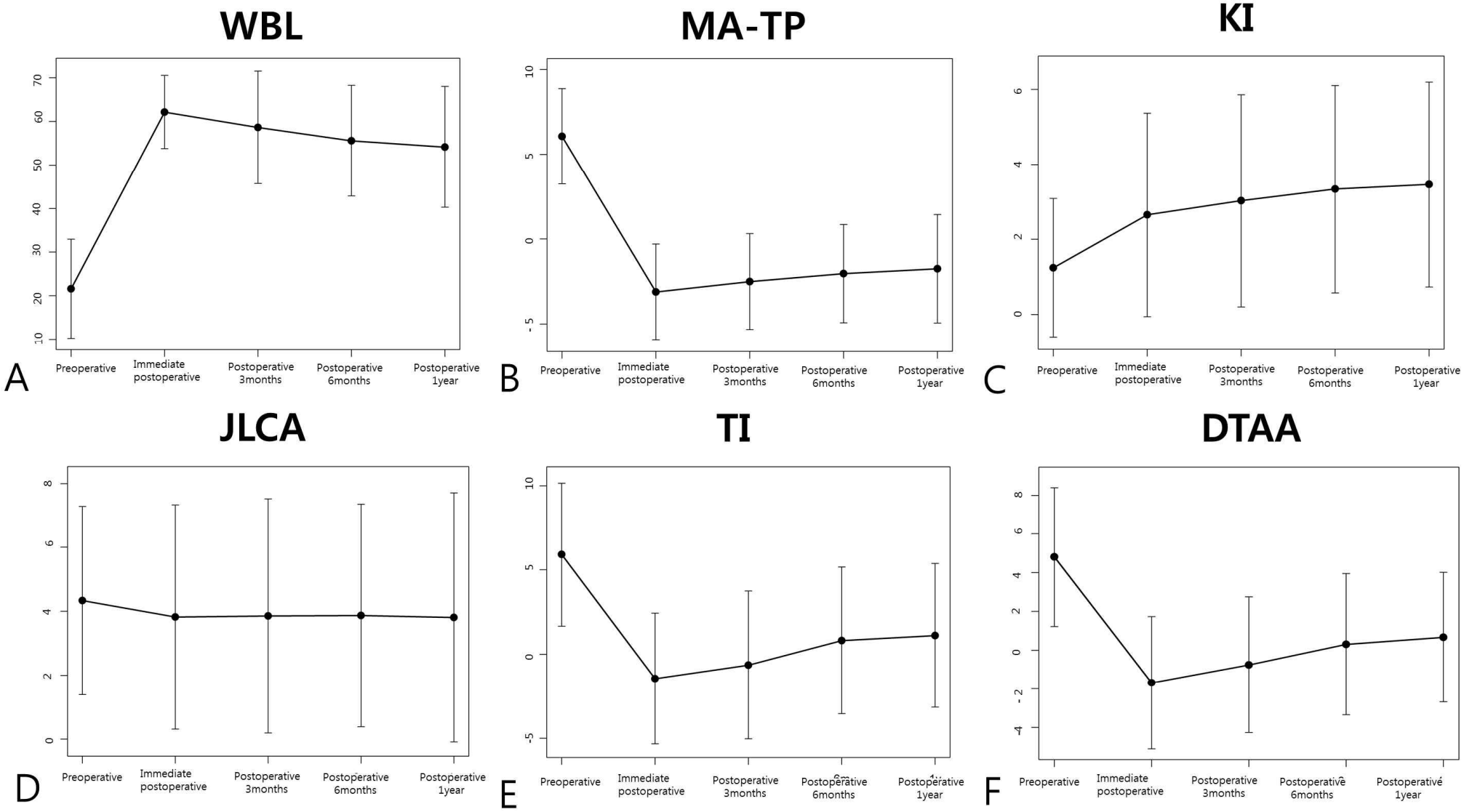
Results

Difference of the parameters between the R and NR group

	R group	NR group	P-value
Postoperative 1year WBL (%)	37.30±10.51	61.02±7.59	<0.05
Immediate postoperative JLCA (mean±SD)	2.55±1.49	1.38±1.38	<0.05
Difference-TI (mean±SD)	5.57±4.16	3.77±2.07	0.05
Difference- DTAA (mean±SD)	4.53±2.64	2.94±2.16	0.18

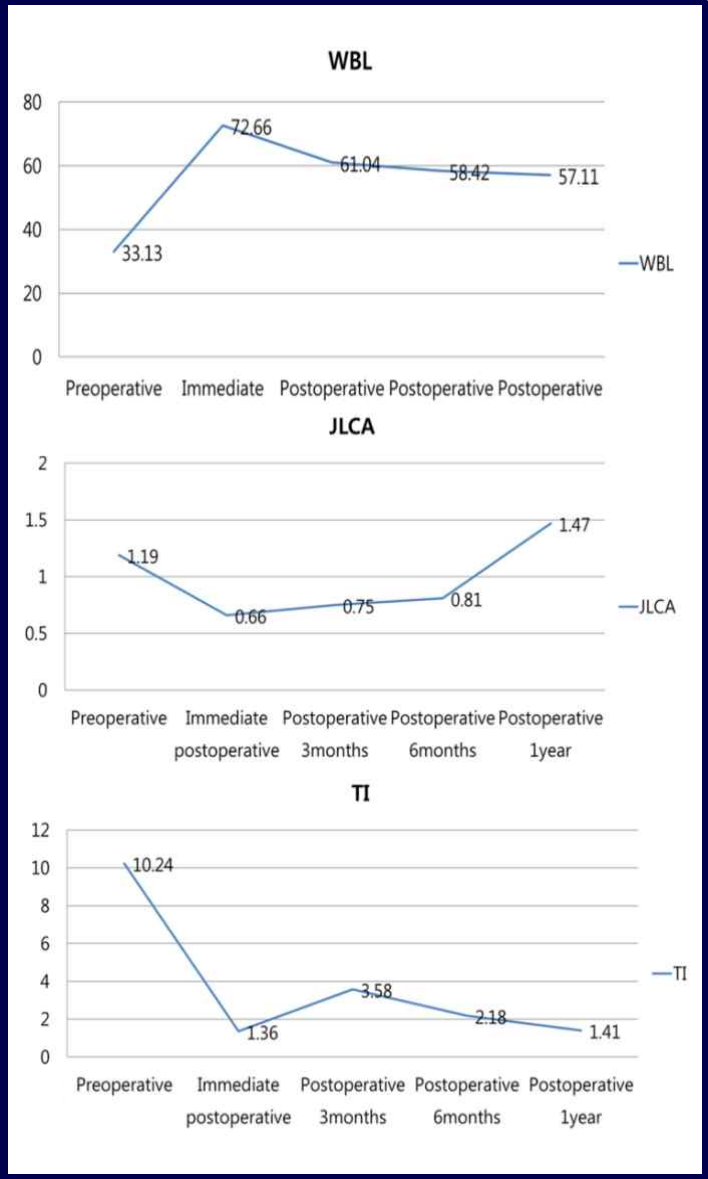
Results

Serial changes of each parameter

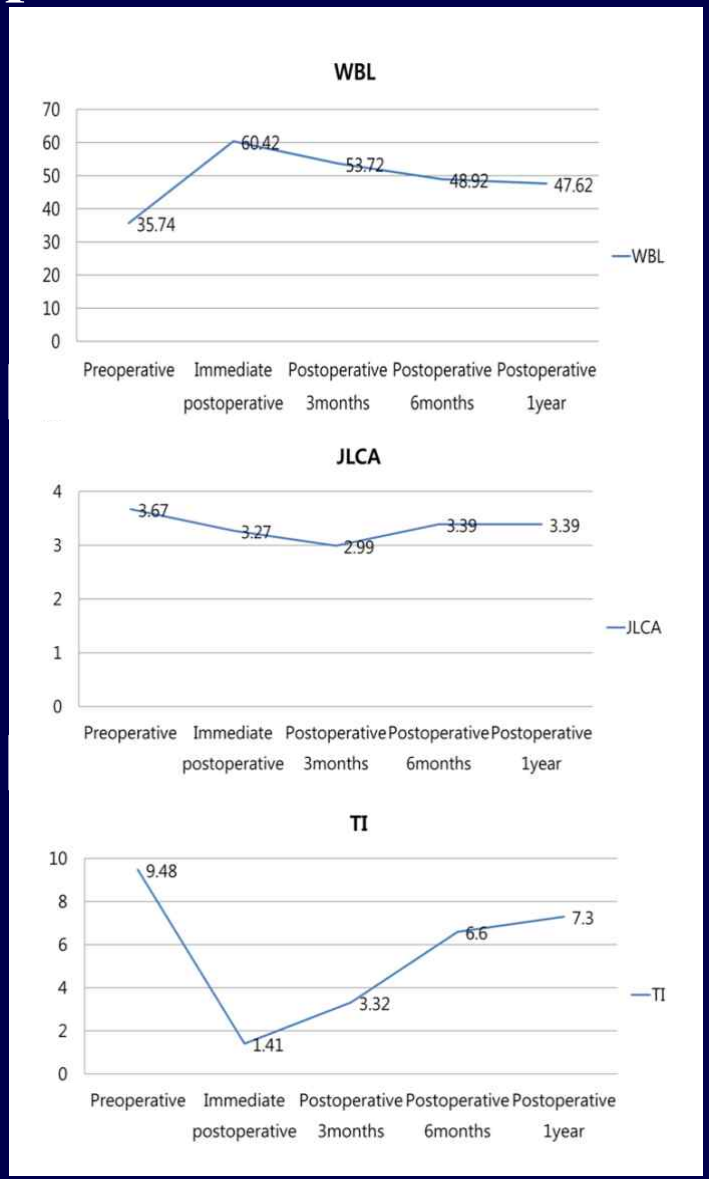


Results

Serial changes of each parameter



NR group



R group

Conclusion

- JLCA, TI, and DTAA showed statistically significant correlations in the serial assessment.

- Among them, JLCA was an important modifiable factor during OWHTO for the prevention of the recurrence because it showed a significant statistical difference between the R and NR groups.

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