

# DOES **TERIPARATIDE** IMPACT THE CLINICAL AND RADIOGRAPHIC OUTCOME OF BALLOON KYPHOPLASTY FOR FRESH OSTEOPOROTIC VERTEBRAL FRACTURE?



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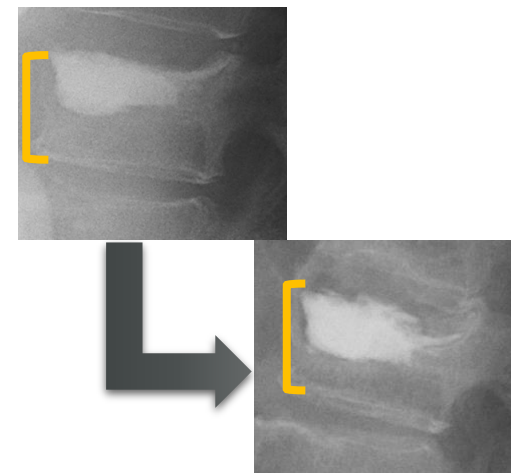
# Introduction



- Balloon Kyphoplasty (BKP) is a safe and effective procedure in the treatment of osteoporotic vertebral fracture (OVF) with a significant and clinically relevant reduction of back pain as well as improvement of QOL.
- Despite the implementation of BKP, problems such as adjacent vertebral fractures (AVF), corrections loss, poor pain relief, and poor recovery of ADL may occur.



Adjacent vertebral fracture (AVF)



Loss of Correction



Poor Pain Relief



Poor Recovery of ADL

- There are only some small size studies examining the impact of teriparatide on incidence of new vertebral fracture after BKP.

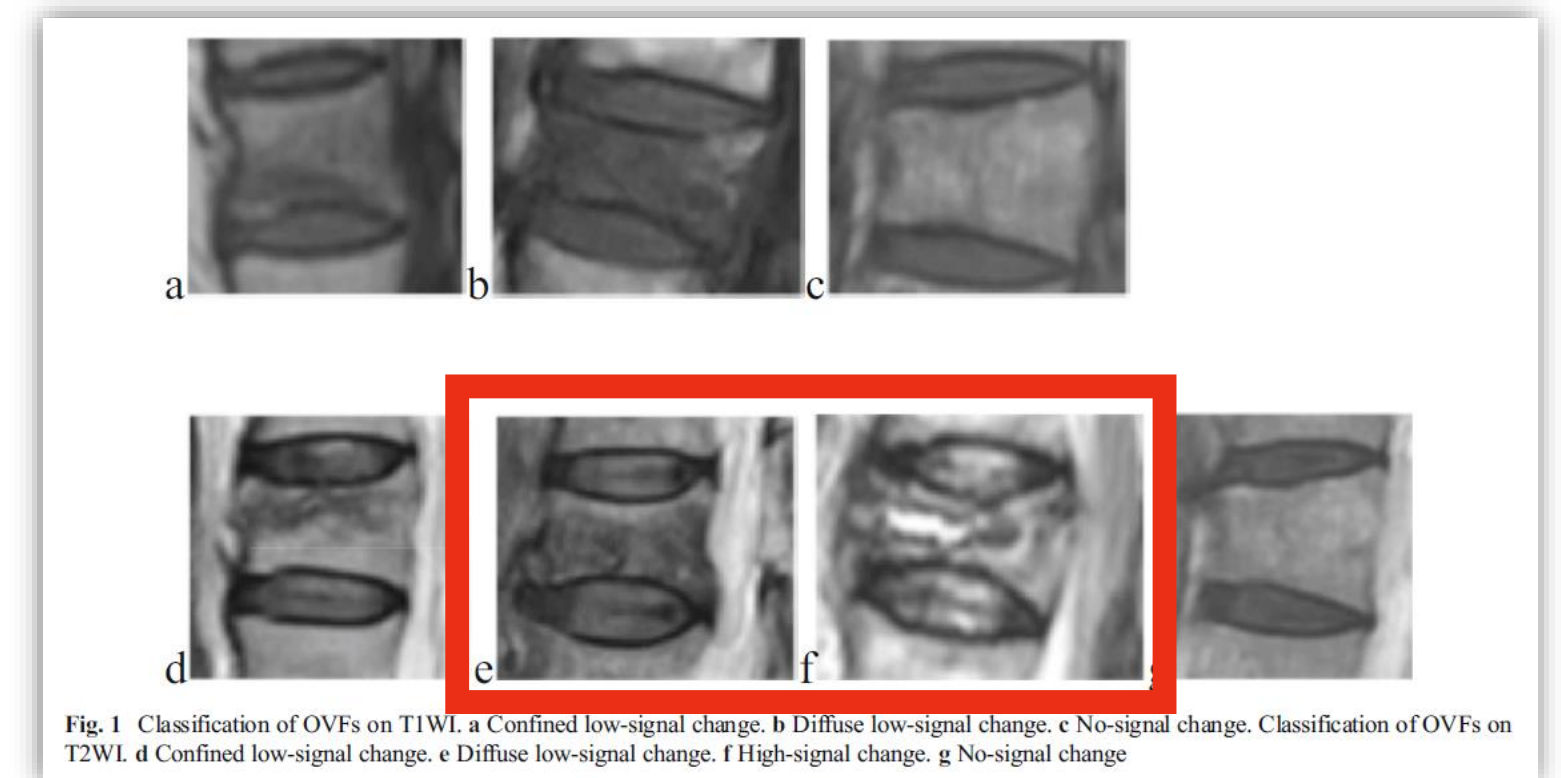
## PURPOSE OF THIS STUDY

- to evaluate the impact of **teriparatide** on the short-term outcome of BKP surgery

# Materials & Methods

- Study design: Multicenter non-randomized controlled study
- Inclusion criteria:
  - Age  $\geq$  65
  - With risk factor\* for delayed union in MRI
  - Underwent BKP for fresh OVF within two months after onset
  - Follow up period  $\geq$  six months

◆ Takahashi S et al. *Osteopros Int.* 2017



\*Risk factor for delayed union

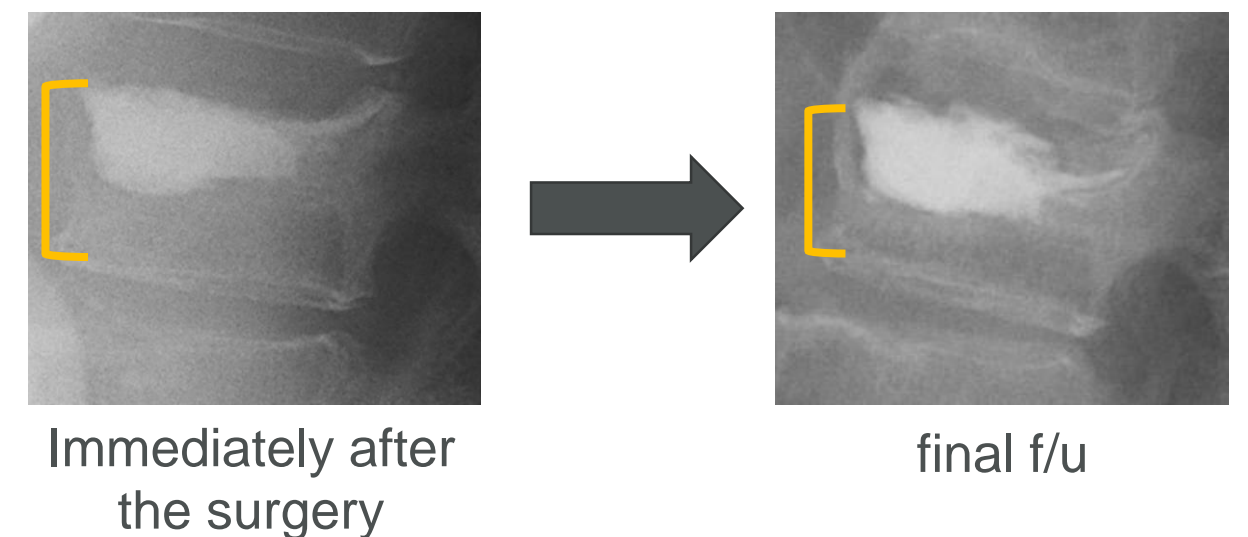
- Diffuse low signal change in T2WI
- High signal change in T2WI

- **Teriparatide** was administered depends on physician's experience.



# Materials & Methods

- Clinical Outcome
  - VAS of low back pain
  - ADL (graded as 1 to 4)
  - SF-36 Physical component summary (PCS) and mental component summary (MCS)
- Complication:
  - Radiographic adjacent vertebral fracture (AVF)
  - Loss of correction:  
(Immediately after the surgery – final f/u)  
/ Immediately after the surgery
- Statistical analysis:
  - Multivariate logistic regression model was used to calculate adjusted odds ratios of teriparatide for ADL decrease (one or more grade) and AVF.
  - Multiple linear regression model was used for VAS, SF-36, and correction loss.



# Results

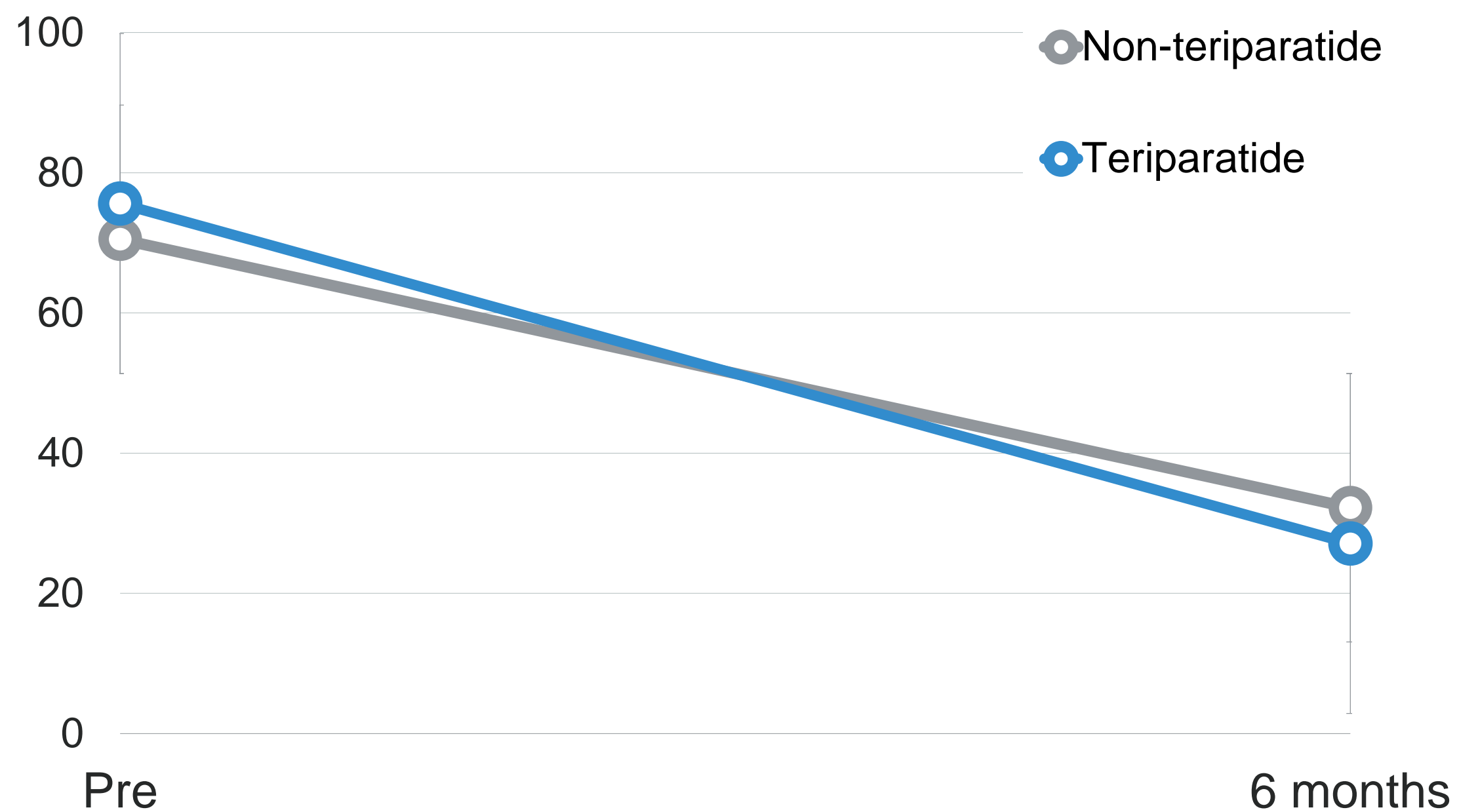
## Baseline Data (N=109)

	Teriparatide N=54	Non-teriparatide N=55	P value*
Age, yrs	79.2 ± 5.0	79.4 ± 5.9	0.873
Sex (female)	47 (87%)	40 (72.7%)	0.094
Prevalent vertebral fracture	29 (54.7%)	23 (41.8%)	0.248
Bisphosphonate use	10 (18.5%)	10 (18.1%)	1.000
Glucocorticoid use	3 (5.6%)	7 (12.7%)	0.320

\*Mann Whitney U test or Chi squared test

# Results

## VAS of LBP

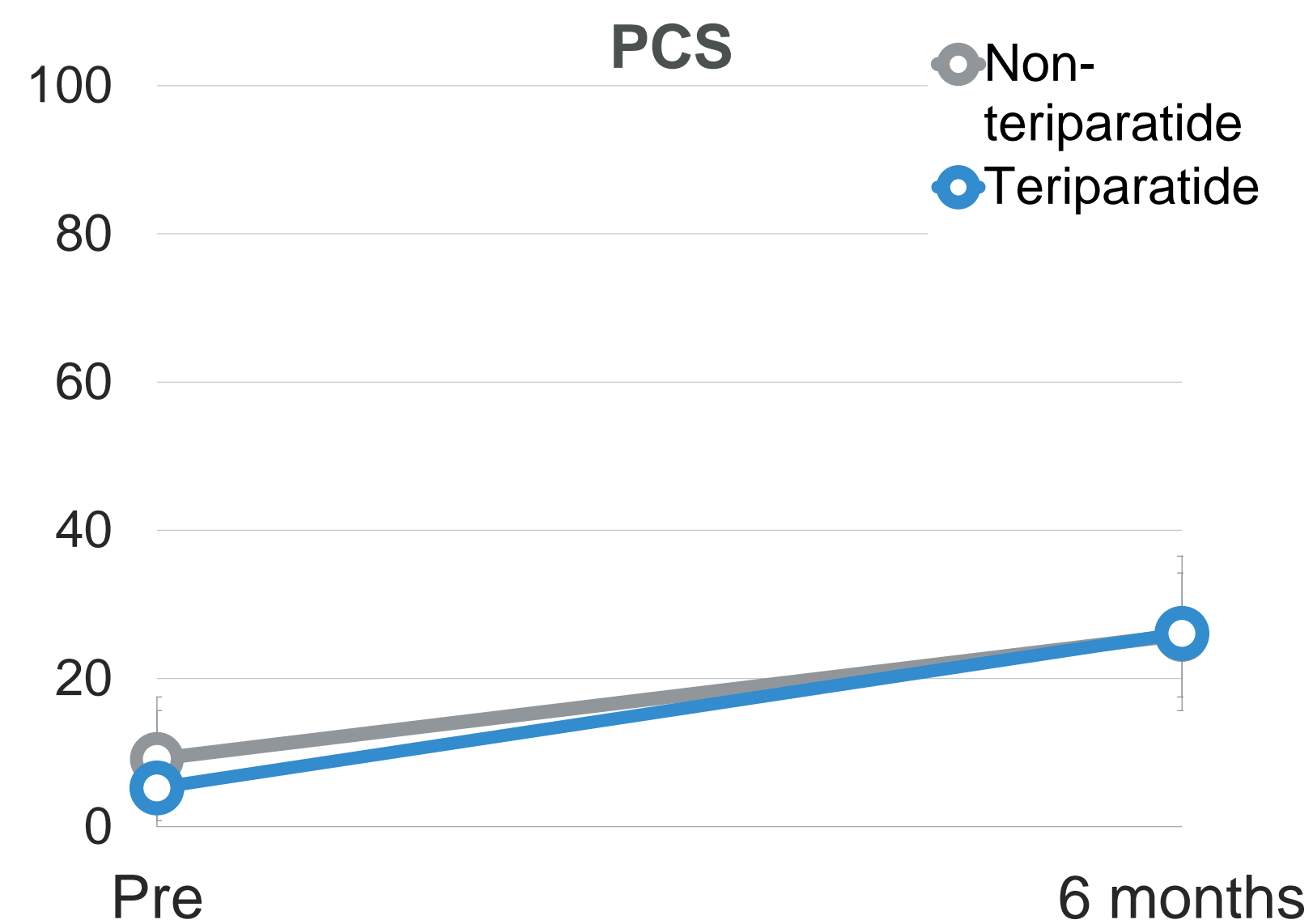
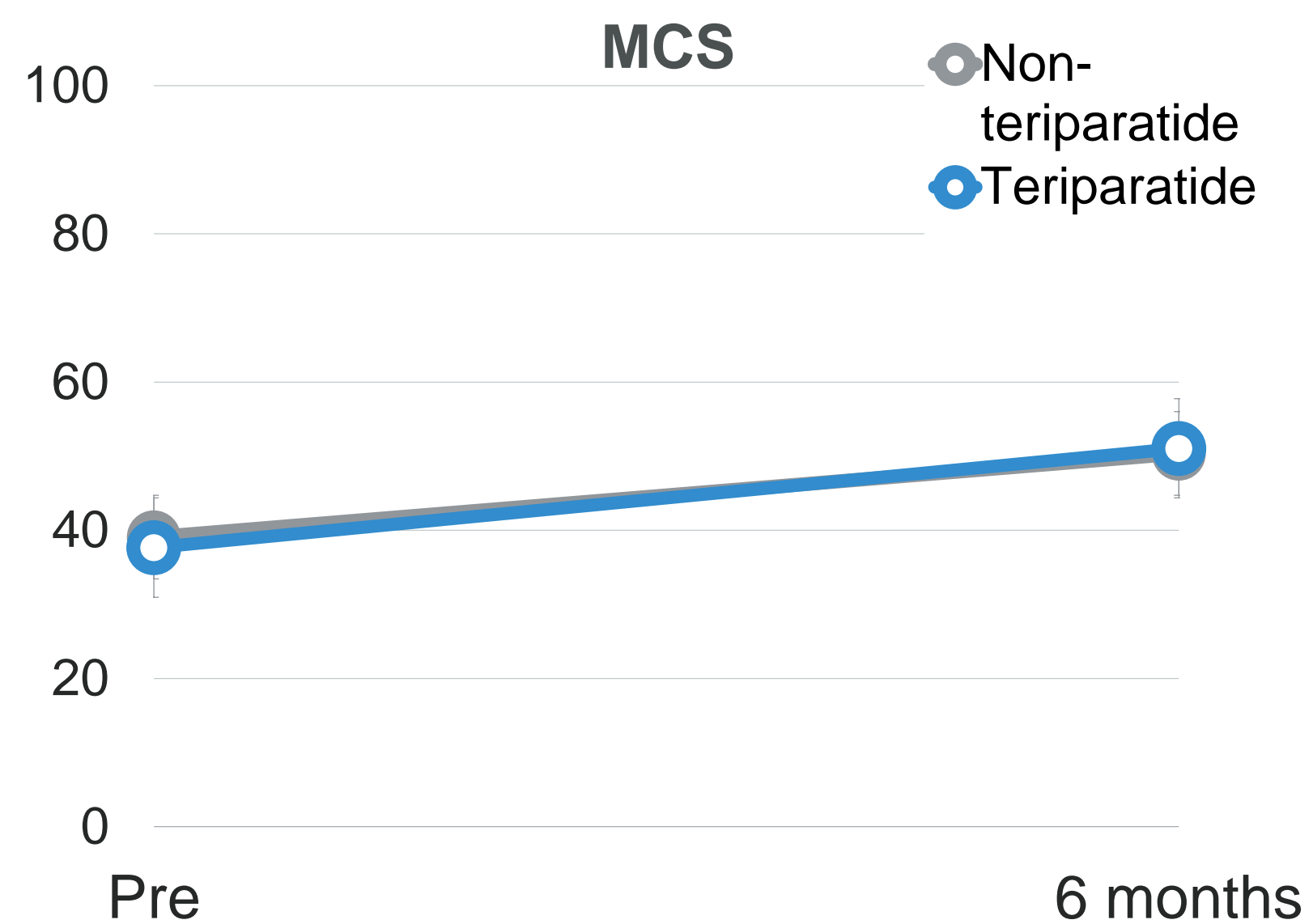


	Teriparatide	Non-teriparatide	P value*
Change, mm	48.5 ± 33.3	38.8 ± 35.4	0.185

\*Multiple linear regression model (adjusted for age and sex)

# Results

## SF 36



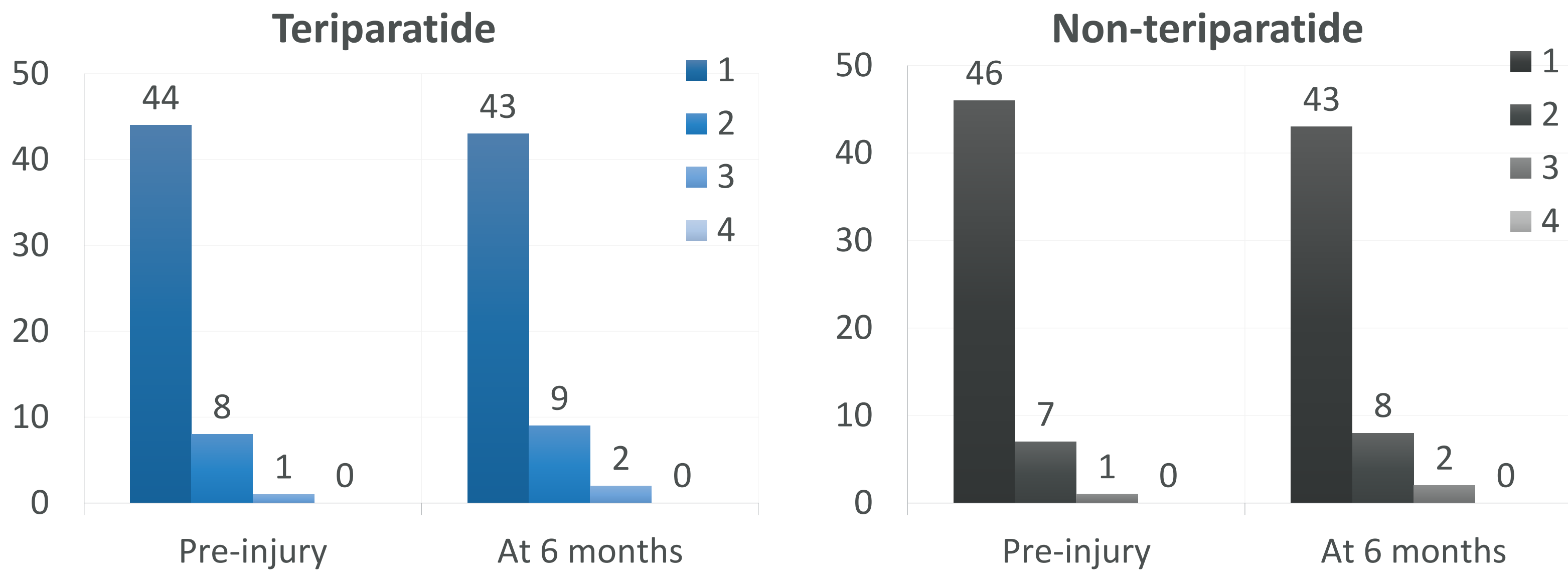
	Teriparatide	Non-teriparatide	P value*
Change	16.3 ± 24.0	11.8 ± 13.9	0.322

	Teriparatide	Non-teriparatide	P value*
Change	21.9 ± 23.4	16.0 ± 20.0	0.180

\*Multiple linear regression model (adjusted for age and sex)

# Results

## ADL



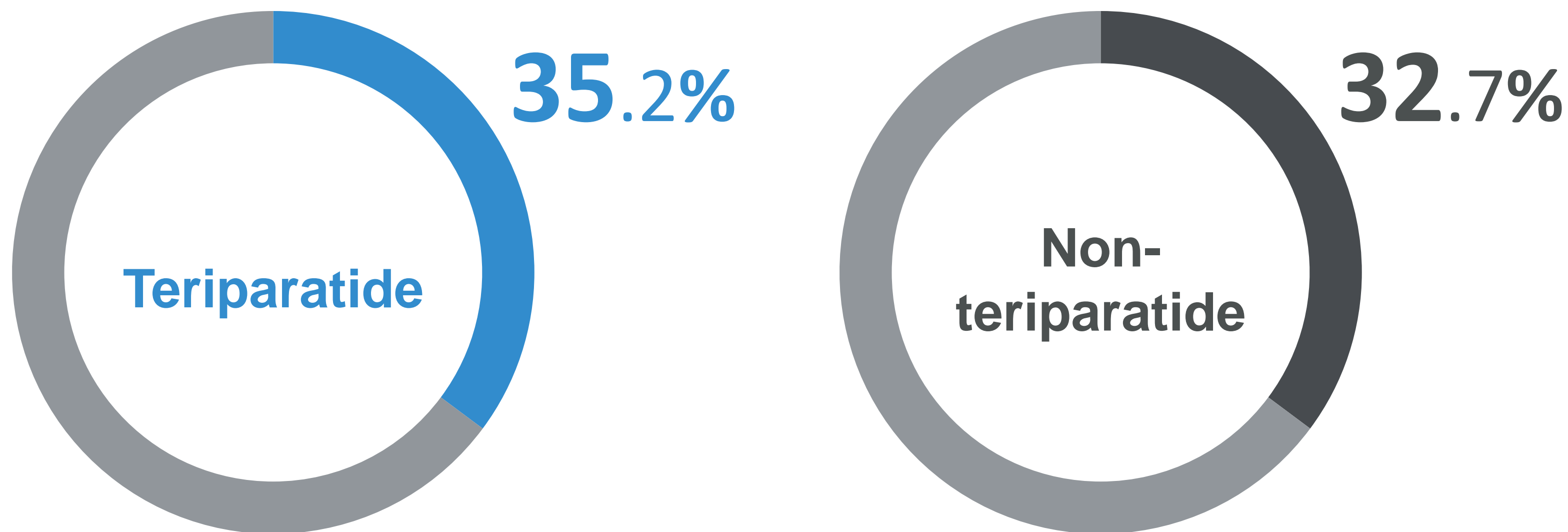
	Teriparatide	Non-teriparatide	P value*
ADL down	4 (7.5%)	5 (9.6%)	0.741

\*Chi squared test



# Results

## Adjacent Vertebral Fracture (AVF)



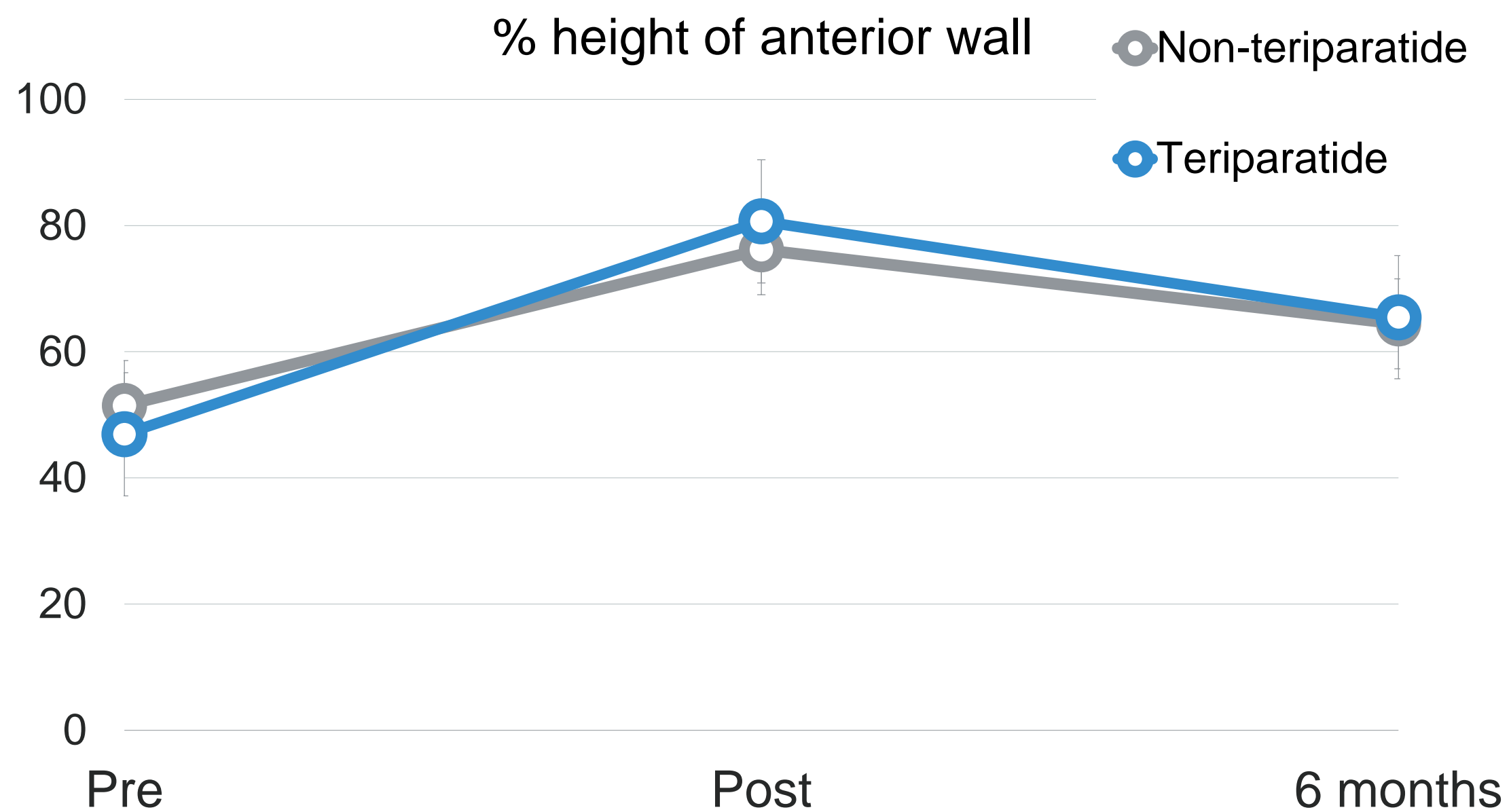
	Adjusted OR*	95% CI	P value
Teriparatide use	1.12	0.48 - 2.63	0.79

\*Adjusted for age and sex

Non-teriparatide was not independent risk factor for AVF.

# Results

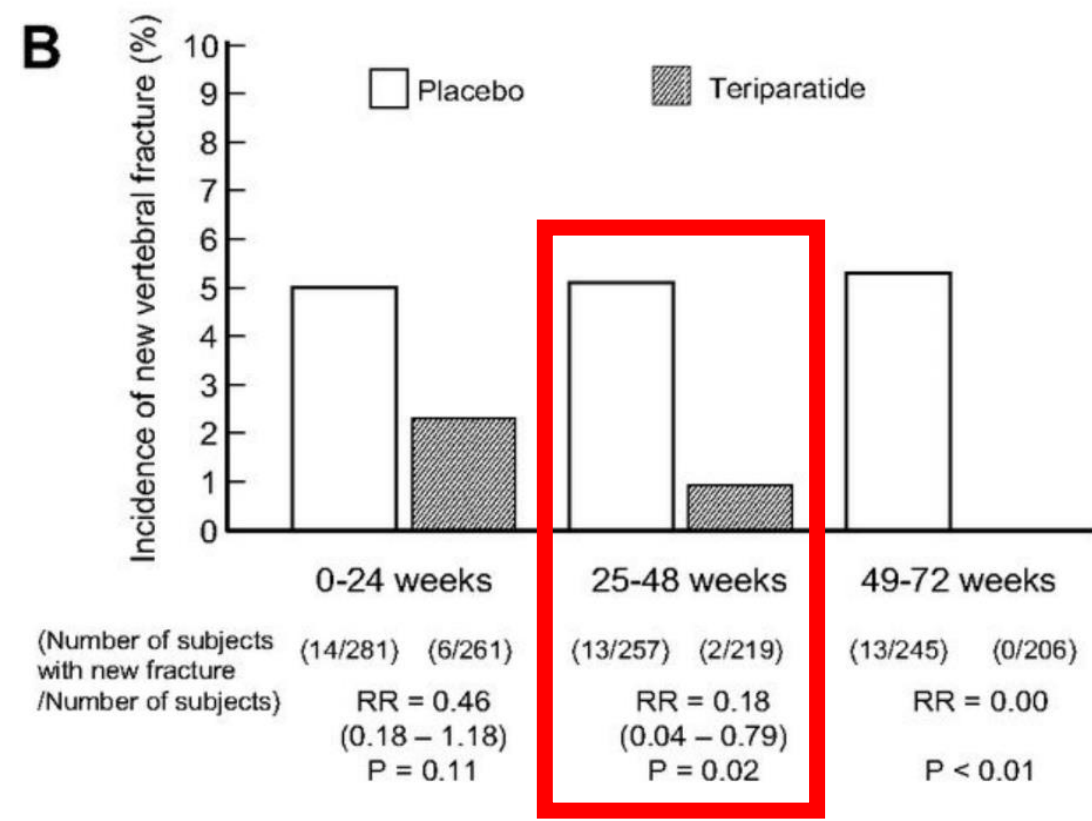
## Correction loss



	Teriparatide	Non-teriparatide	P value*
Correction loss, %	18.7 ± 12.7	14.9 ± 13.9	0.278

\*Multiple linear regression model (adjusted for age and sex)

# Discussion

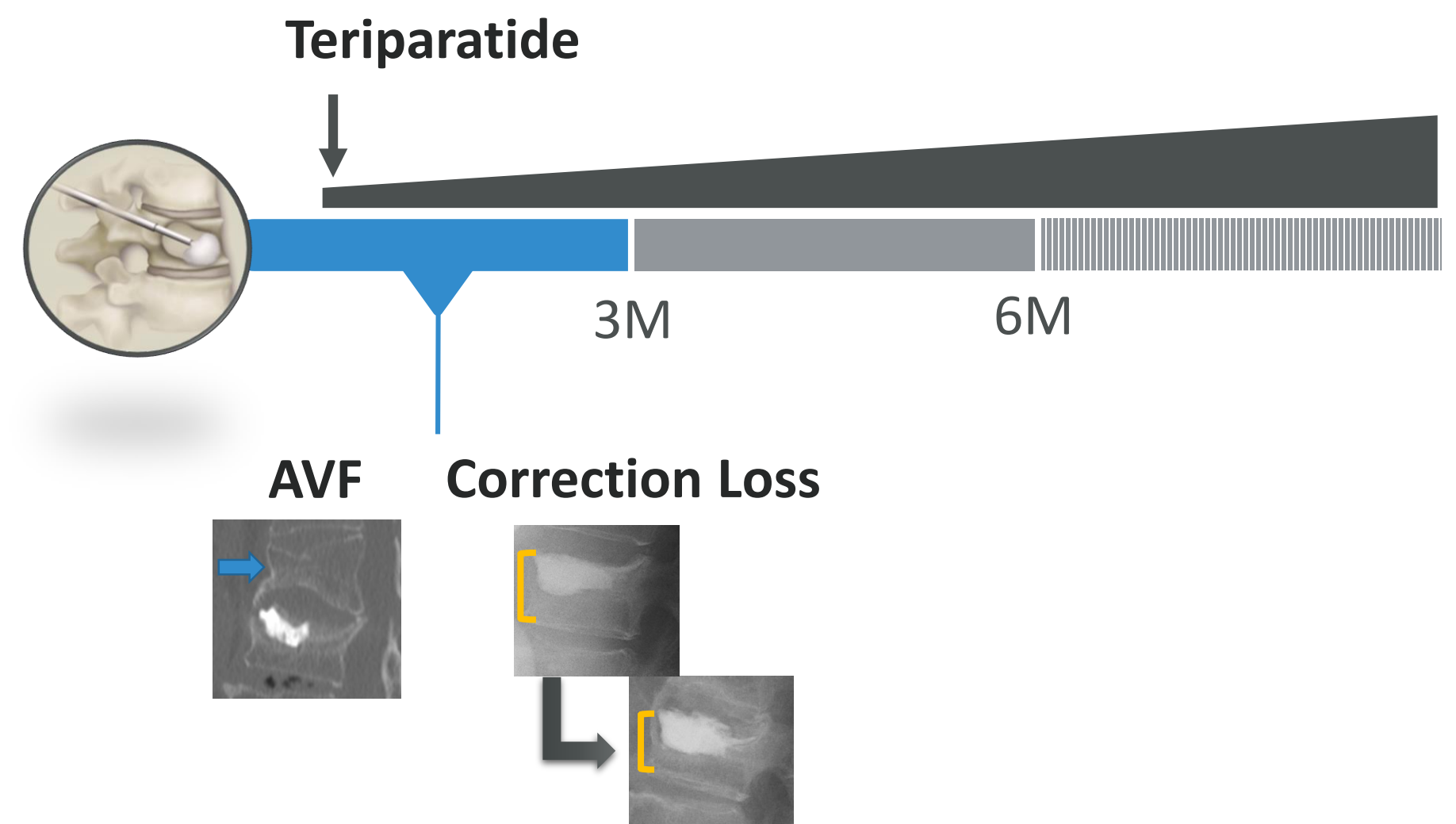


- Nakamura T. et al. conducted randomized teriparatide once-weekly efficacy research (TOWER) trial for examining the reduction in new vertebral fractures in subjects with primary osteoporosis and high fracture risk.
- The reported the incidences of new vertebral fractures were significantly reduced in teriparatide group **after first 24 weeks.**

Nakamura T. et al. *The Journal of Clinical Endocrinology & Metabolism*. 2012

In our series...

- More than 80% of **AVF and correction loss occurred within three months** after the procedure.
- Almost all patient had **started teriparatide after BKP.**



**AVF and correction loss might occur before the effect of Teriparatide appeared.**

# Conclusion

- In the current study, clinical and radiographic outcome of BKP were similar at six months after the procedure with or without teriparatide.
- These results suggested that teriparatide after BKP may not prevent AVF or correction loss and improve clinical outcome.

## DISCLOSURE

✓ I and co-author have nothing to disclose.