

Effects of secukinumab on enthesiophyte and erosion progression in psoriatic arthritis

A one-year double-blind, randomized, placebo-controlled trial utilizing HR-pQCT

Isaac T Cheng¹, Yingzhao Jin¹, Ho So¹, Billy T Lai², Shirley K Ying³, Kitty Y Kwok⁴, Jolly M Lee⁵, James Griffith⁶, Vivian Hung⁷, Ling Qin⁷, Lai-shan Tam¹ ¹Department of Medicine and Therapeutics, The Chinese University of Hong Kong ²Tseung Kwan O Hospital, Hong Kong, ³Pricne Margaret Hospital, Hong Kong, ⁴Queen Elizabeth Hospital, Hong Kong, ⁵Tai Po Hospital, Hong Kong, ⁶Department of Imaging and Interventional Radiology, The Chinese University of Hong Kong, ⁷Bone Quality and Health Center, The Chinese University of Hong Kong



Introduction

- ❖ Uncontrolled inflammation can result in significant bone damage and loss of physical function.
- ❖ Detection of bone erosions and enthesophyte using conventional radiography has low sensitivity.
- ❖ High-resolution peripheral quantitative CT (HR-pQCT) is a novel technique for detailed bone microstructure analysis with high reproducibility in assessing bony erosion and enthesophyte.
- ❖ A previous single arm study demonstrated promising results in halting bone damage on HR-pQCT after six months of anti-IL-17 treatment.
- ❖ **The aim of this study was to ascertain the effect of secukinumab on erosion and enthesophyte progression in PsA by HR-pQCT.**

Methods

- ❖ Progression of enthesiophyte were defined as changes in volume exceeding smallest detectable change (SDC) (0.12mm³) or the identification of any new enthesophyte.
- ❖ 1-year, double-blind, randomized, placebo controlled trial (NCT0362386740)
- ❖ Patients with erosion in MCPJ 2-4 were randomised in a 1:1 ratio to either the secukinumab (150mg) or placebo group.
- ❖ HR-pQCT of the MCPJ 2-4 were performed at baseline, week 24 and week 48.
- ❖ Partial repair of erosion was defined as a reduction in erosion volume greater than SDC (0.1mm³).

Results

- ❖ 40 patients (age: 51.9±13.4 years, 20 [50%] male, disease duration: 4.7±6.7years) were recruited.
- ❖ 34 patients who completed study treatment were included in this per-protocol analysis.
- ❖ Baseline characteristics between two groups are enlisted in table 1.
- ❖ Patients in the secukinumab group had a greater improvement in clinical disease (Fig 1)

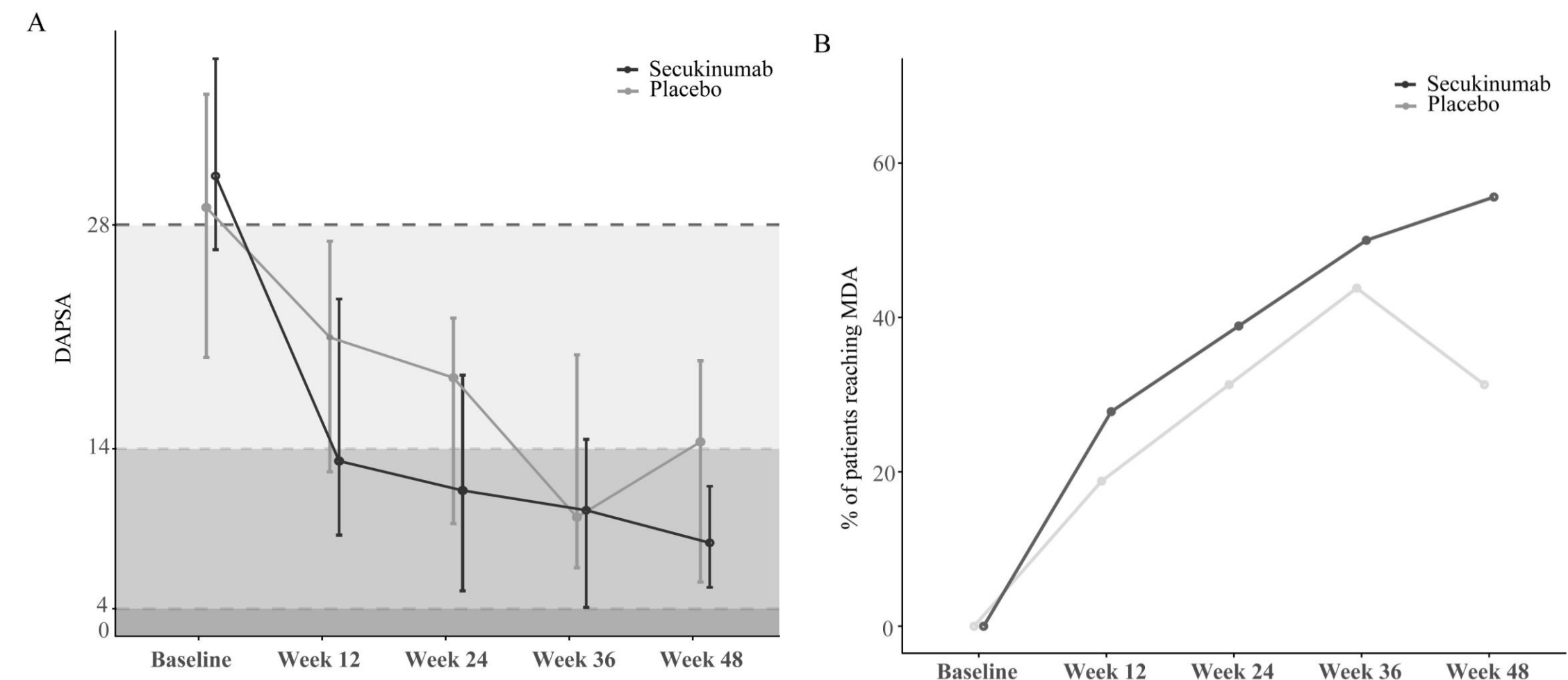


Fig 1. Changes in (A) DAPSA and (B) proportions of patients achieving MDA over one year

Results (cond't)

Changes in erosion

- ❖ Significant difference was observed in the change in erosion volume between the two groups. (Fig 2A).
- ❖ Fewer patients developed new erosions in the secukinumab group compared to the placebo group (Fig 2B).
- ❖ A higher proportion of pre-existing erosion in secukinumab exhibited partial erosion healing (51% vs 30%, $p=0.029$) (Fig 2C).
- ❖ Using GEE, the OR for erosion regression in the secukinumab group was 2.82 (95% CI: 1.11-7.15, $p=0.029$).

Changes in enthesiophyte

- ❖ Significant difference was observed in the change in enthesophyte volume between the two groups (Fig 2D).
- ❖ 1 and 6 new enthesiophytes were identified in the secukinumab group and placebo group respectively (Fig 2E).
- ❖ The proportion of enthesiophytes with progression tended to be higher in the placebo group compared to the secukinumab group (Fig 2F).
- ❖ The GEE analysis showed that the OR for enthesiophyte progression in the secukinumab group was 0.26 (95% CI: 0.078-0.87, $p=0.029$).

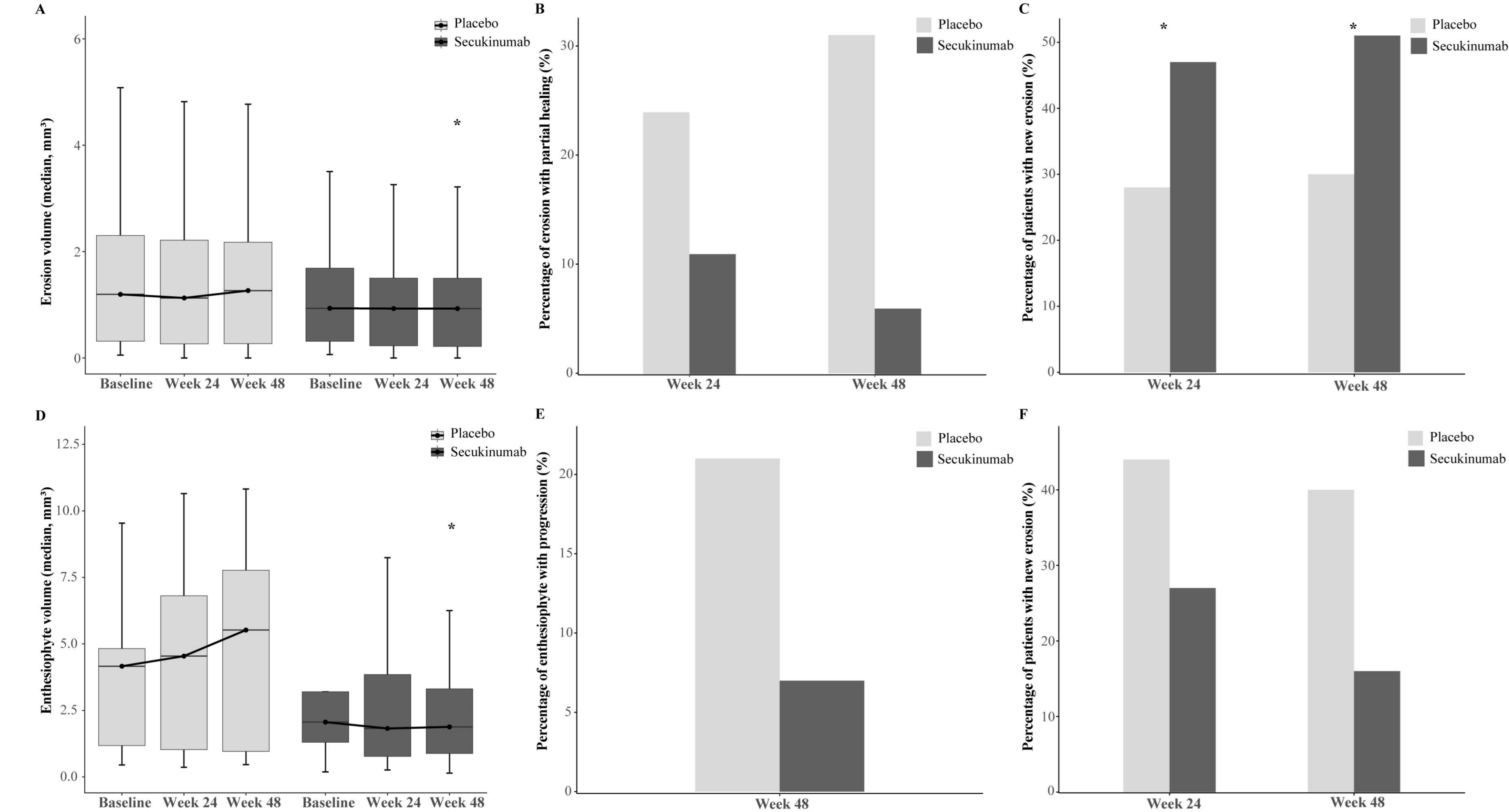


Fig 2 Erosion and enthesiophyte parameters and their changes over time by HR-pQCT.

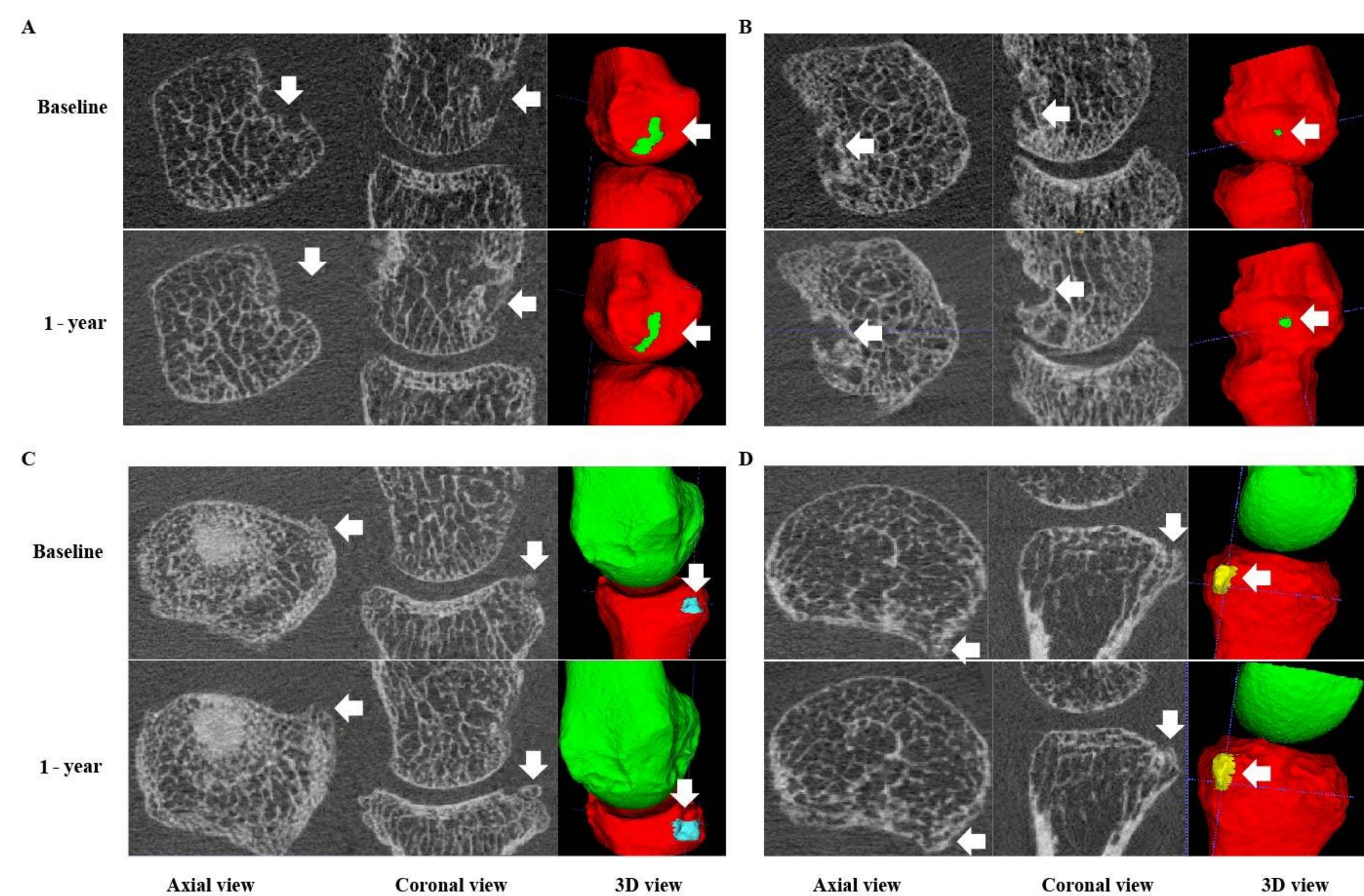


Fig 3. Typical images depicting changes in erosion and enthesiophyte size

- A. In the secukinumab group, there was partial healing of erosion as depicted in green.
- B. Erosion progressed in the placebo group as depicted in green.
- C. Enthesiophyte progressed in the placebo group as depicted in blue.
- D. Enthesiophyte size remained stable in the secukinumab group as depicted in yellow.

Arrows indicate the presence of erosion in figures A and B, and enthesiophyte in figures C and D.

Conclusion

Secukinumab may facilitate partial erosion repair and prevent enthesiophyte progression in PsA patients.

Further research with a larger sample size and longer follow-up period would be helpful to validate these findings.

Table 1. Patient characteristics at baseline

	Placebo (n=20)	Secukinumab (n=20)	p
Age, years	55.0 (35.9, 60.8)	56.3 (42.9, 64.9)	0.602
Sex, female (%)	11 (55.0%)	9 (45.0%)	0.527
BMI, kg/m ²	24.8±3.0	24.1±3.6	0.504
PsO duration, years	10.6 (3.0, 23.3)	12.6 (7.4, 20.1)	0.799
PsA duration, years	0.5 (0.2, 9.4)	1.0 (0.2, 6.4)	0.758
ESR, mm/h	29.0 (18.0, 51.3)	49.5 (22.3, 74.3)	0.165
CRP, mg/L	5.0 (1.9, 13.0)	15.5 (3.7, 22.4)	0.052
PASI	4.1 (1.7, 7.3)	4.3 (1.4, 7.3)	0.989
HAQ	0.5 (0.2, 1.1)	1.1 (0.4, 1.4)	0.149
Tender joint count	10.0 (7.3, 15.3)	10.0 (8.0, 14.8)	0.925
Swollen joint count	4.5 (3.3, 6.8)	4.0 (3.0, 6.0)	0.620
Damage joint count	2.0 (1.3, 6.0)	2.5 (1.0, 6.0)	0.799
Dactylitis	1.0 (0.0, 2.0)	0.0 (0.0, 1.0)	0.221
Enthesitis	0.0 (0.0, 1.8)	0.0 (0.0, 2.0)	0.989
NRS pain, 0-100mm	5.3±1.8	6.5±1.9	0.058
NRS PatGA, 0-100mm	5.0 (5.0, 7.8)	7.0 (6.0, 8.0)	0.033
NRS PhyGA, 0-100mm	6.5 (5.3, 8.0)	6.0 (5.0, 7.8)	0.565
DAPSA	28.3±8.8	31.5±6.8	0.205
MDA achievement	0 (0.0%)	0 (0.0%)	-
csDMARDs	12 (60.0%)	12 (60.0%)	1.000
Methotrexate	10 (50.0%)	12 (60.0%)	0.525
Sulphalazine	1 (5.0%)	1 (5.0%)	1.000
Cyclosporine	2 (10.0%)	0 (0.0%)	0.487
Glucocorticoids	0 (0.0%)	1 (5.0%)	1.000
NSAIDs	15 (75.0%)	15 (75.0%)	1.000

BMI, body mass index; PsO, psoriasis; PsA, psoriatic arthritis; ESR, erythrocyte sedimentation rate; CRP, C-reactive protein; PASI, Psoriasis Area and Severity Index; HAQ, Health Assessment Questionnaire score; NRS, Numeric Pain Rating Scale; PhyGA, Physician Global Assessment; PatGA, Patient Global Assessment; DAPSA, Disease Activity in Psoriatic Arthritis; MDA, minimal disease activity; csDMARDs, conventional synthetic disease-modifying anti-rheumatic drugs; NSAIDs, nonsteroidal anti-inflammatory drugs.

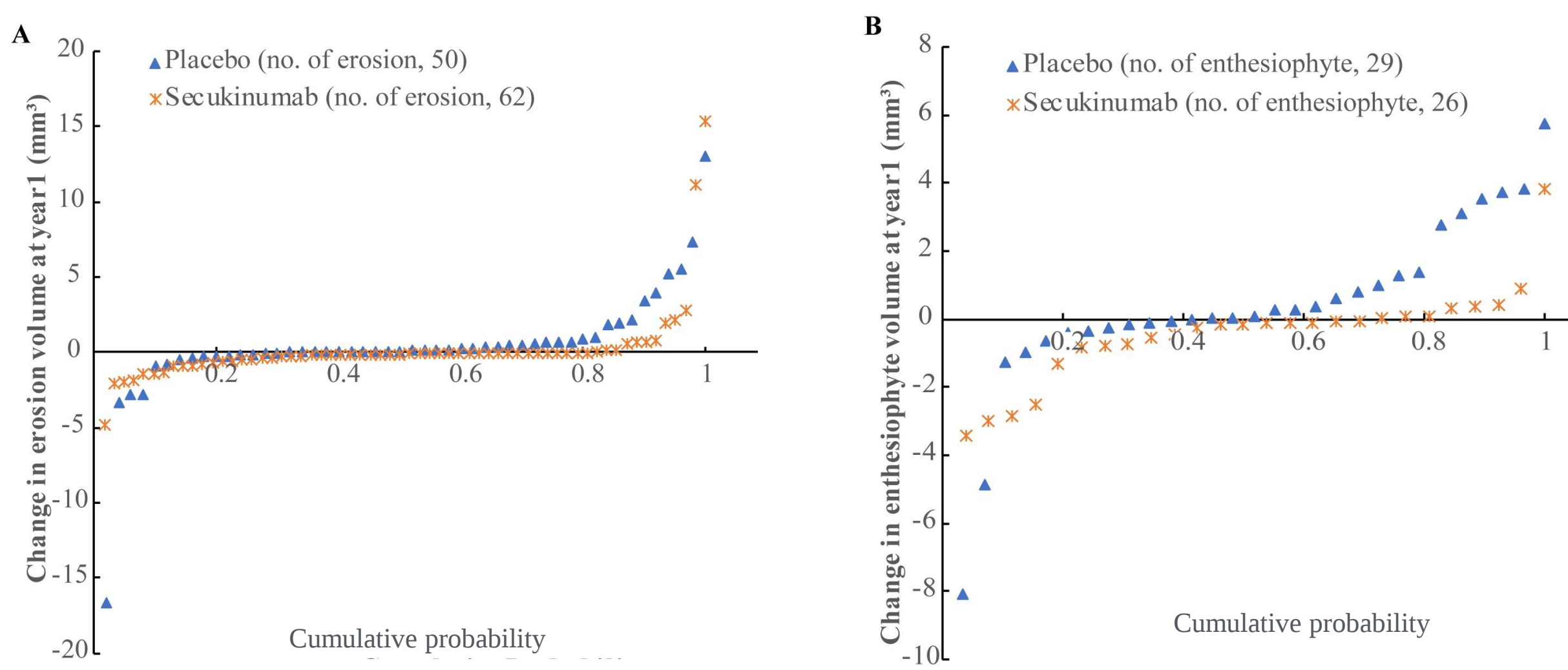


Fig 4. Cumulative probability plot of change in (A) erosion and (B) enthesiophyte volume by HR-pQCT. Each dot represents one erosion/enthesiophyte. The x-axis indicates the proportion of patients; the y-axis indicates the change of erosion or enthesiophyte volume for individual lesion from baseline to week 48.