

Biomechanical Condylar Regeneration

in Early-Stage Degenerative TMJ disease

Pre-

Post-

Jie Lei¹, Adrian U-Jin Yap^{1,2}, Mu-Qing Liu¹, Kai-Yuan Fu¹

¹Center for TMD & Orofacial pain, Peking University School and Hospital of Stomatology, Beijing, P. R. China ²Ng Teng Fong General Hospital, National University Health System, Singapore

Email: kqkyfu@bjmu.edu.cn

Objective

To determine the effect of anterior repositioning splint (ARS) on osseous condylar changes in adolescents/young adults with early-stage degenerative joint disease (DJD).

Methods 12~30yo patients with early-stage TMJ OA n=69 **Pre-treatment bilateral** TMJs CBCT scans Conservative treatment with ARS Conservative without treatment ARS therapy (Control) n=35 therapy (Splint group) n=34 Acute TMJ closed-lock received physical disc reduction n=14 ARS therapy for 6 months 6~12 months follow up 6~12 months follow up Lost during follow up n=4 Lost during follow up n=6 Analyzed n=28, 32 joints Analyzed n=31, 35 joints Post-treatment bilateral TMJs CBCT scans Pre- and Post- CBCT assessment of condylar osseous changes

Results

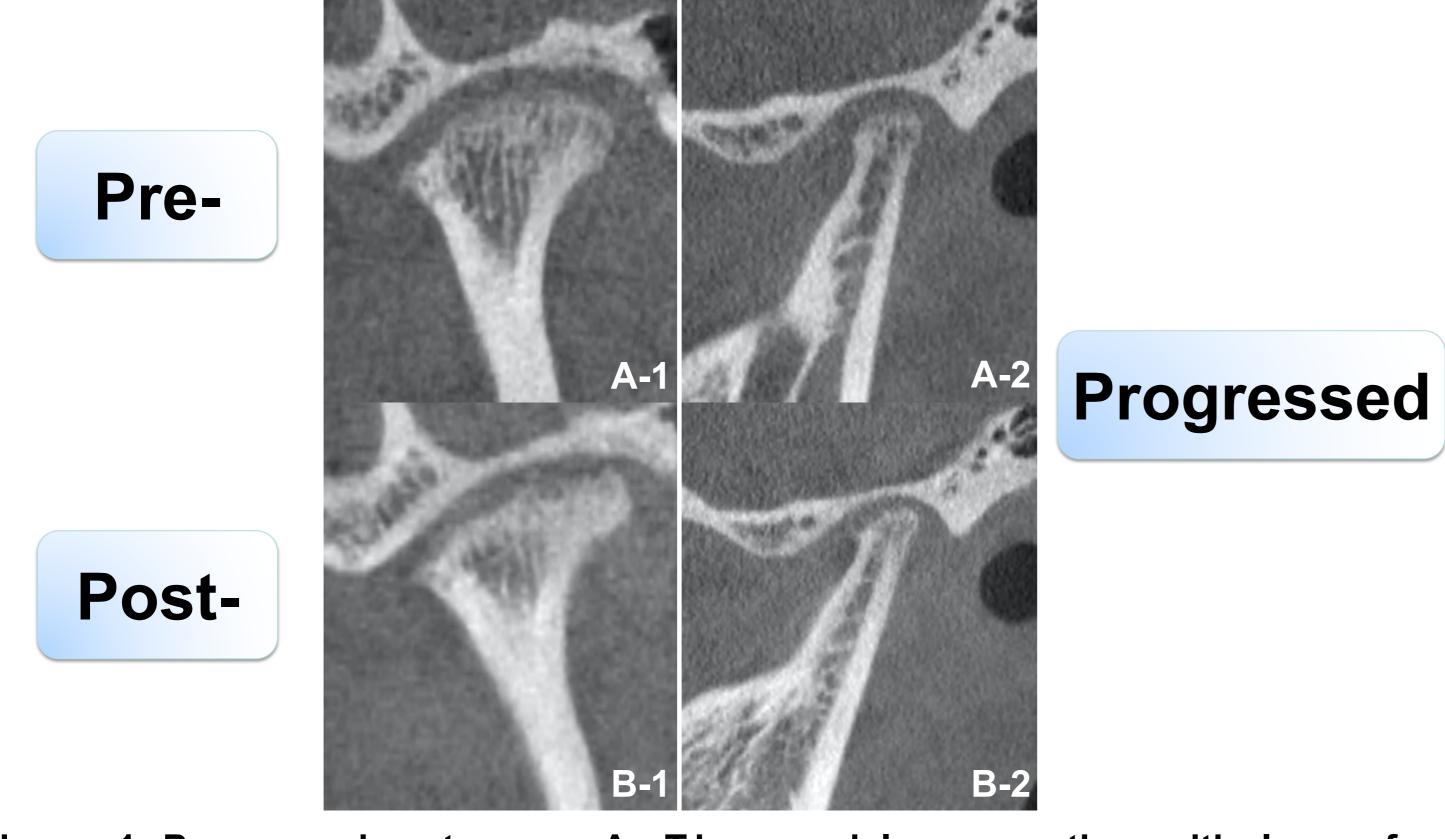


Figure 1 Progressed category: A, The condyle presenting with loss of continuity of articular cortex pre-treatment; B, The condyle presenting with articular surface erosion and flattening post-treatment.

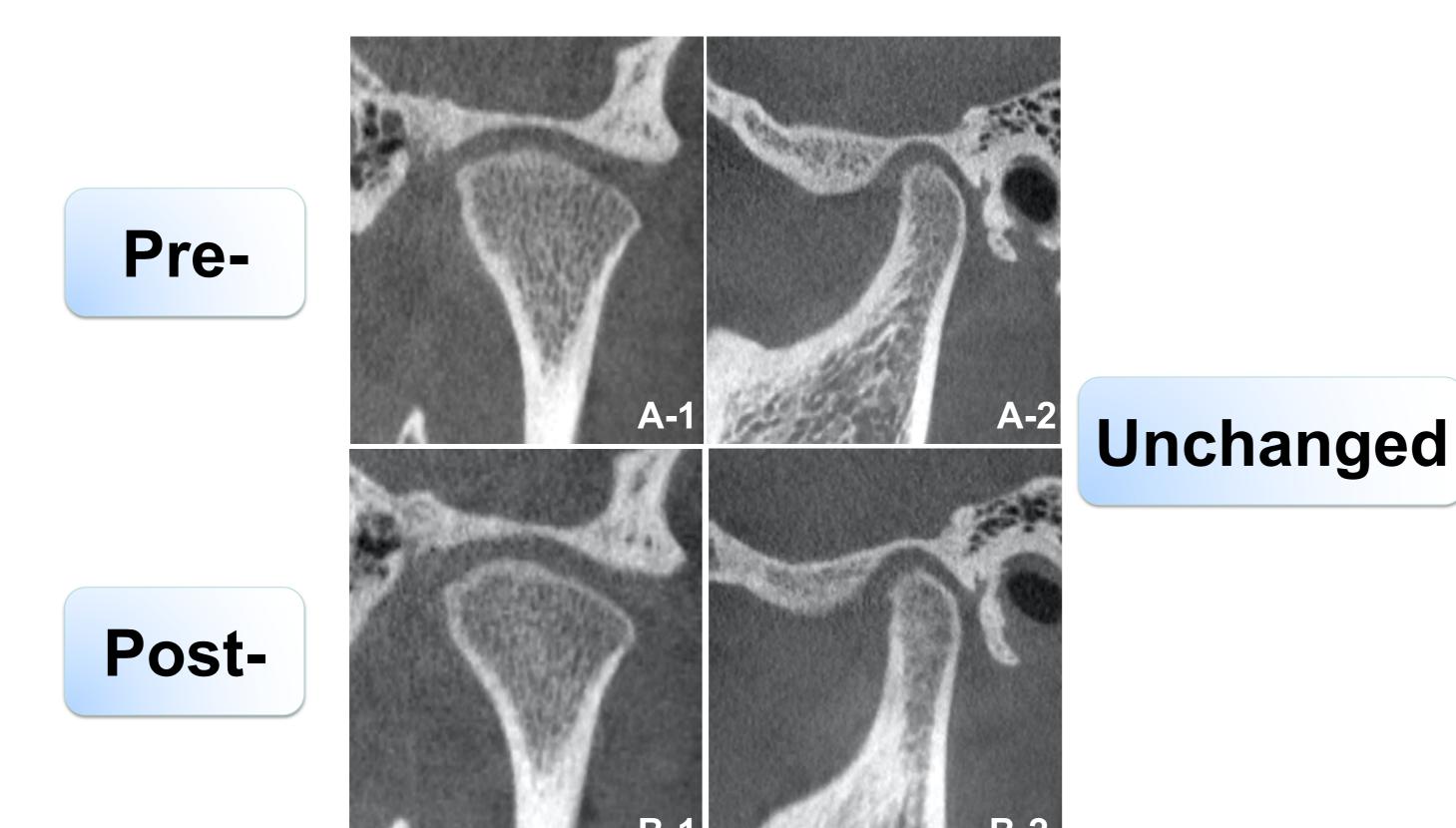


Figure 2 Unchanged category: A, The condyle presenting with loss of continuity of the articular cortex pre-treatment; B, The condyle presenting with no bony changes post-treatment.

Acknowledgements: This work was supported by the Capital Clinical Research Project [Z141107002514157] from Beijing Municipal Science & Technology Commission.

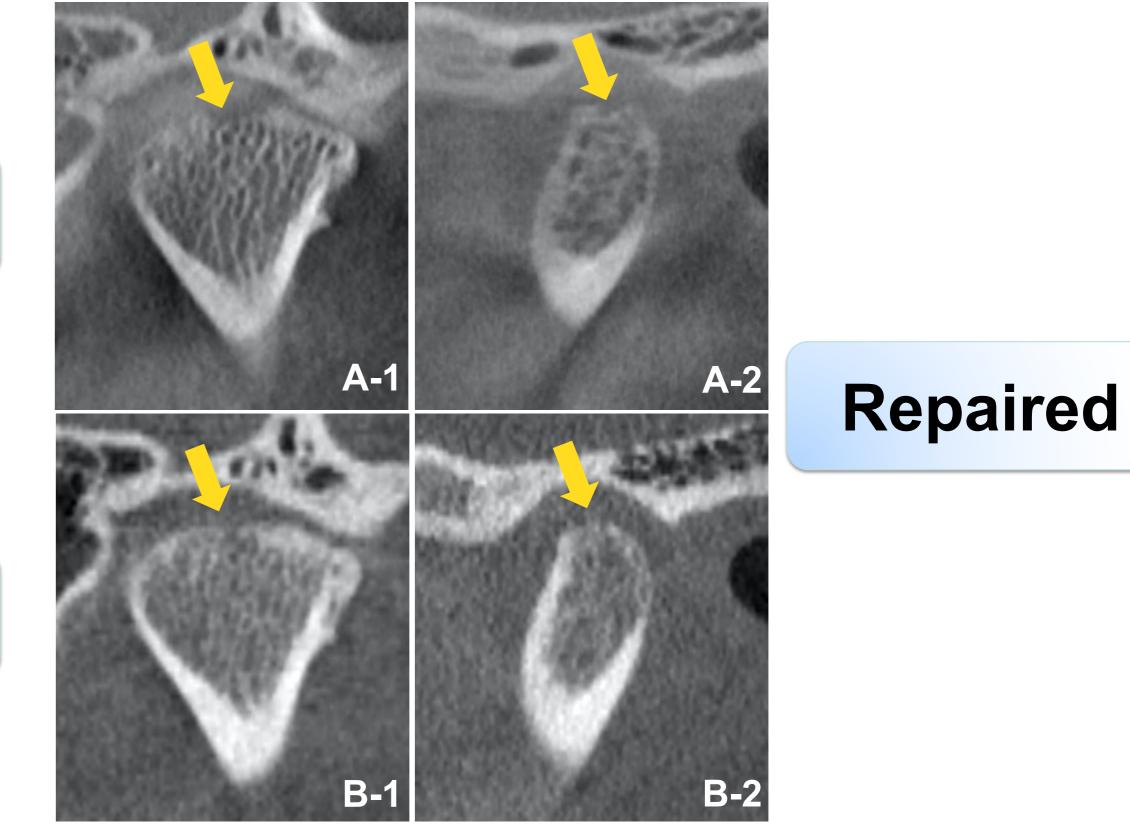


Figure 3 Repaired category (remodeled without new bone formation): A, The condyle presenting with articular surface destruction pre-treatment; B, The condyle presenting with smooth articular surface post-treatment.

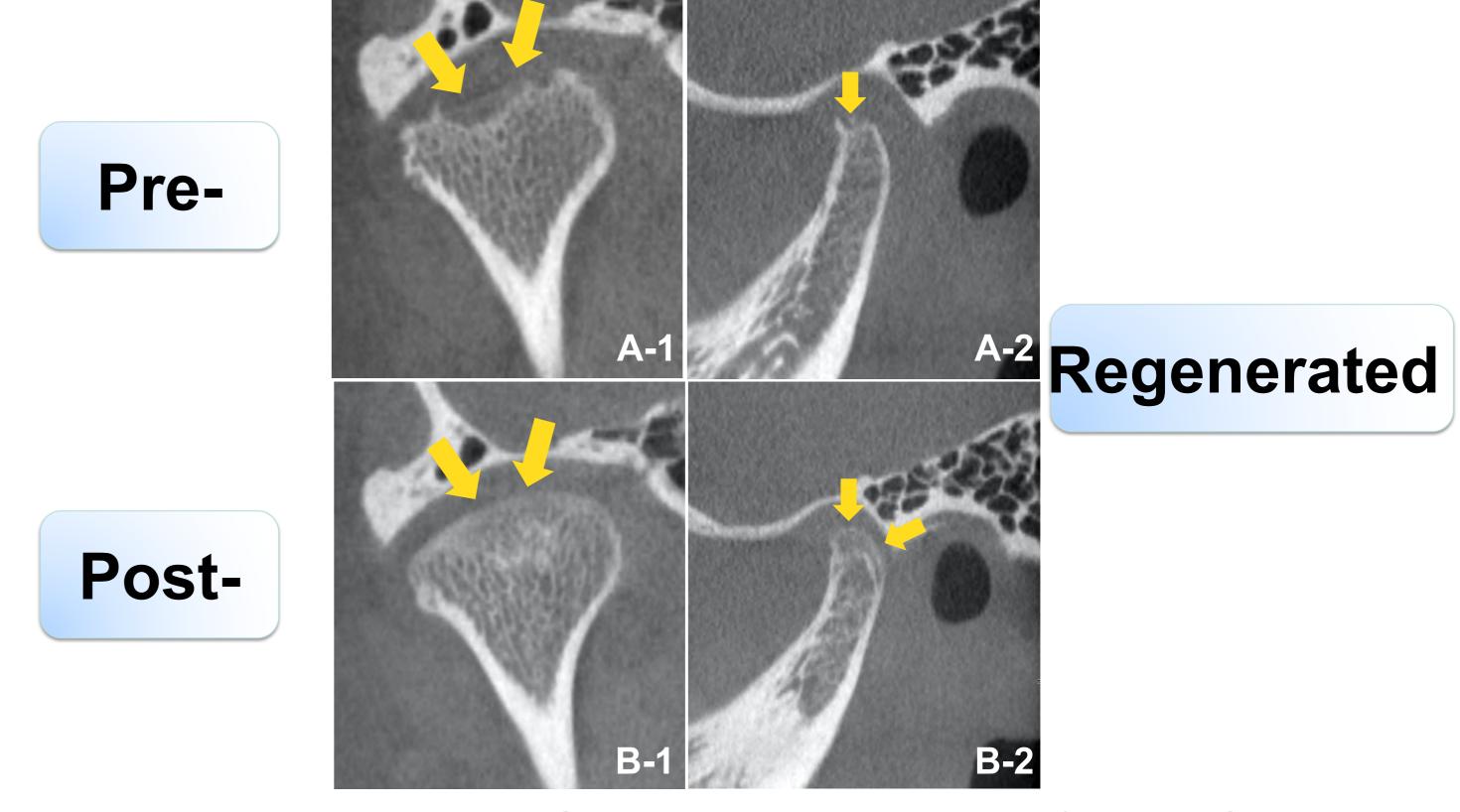


Figure 4 Regenerated category (remodeled with new bone formation): A, The condyle presenting with articular surface destruction pre-treatment; B, The condyle presenting with "double contour" images over the previous bony defect post-treatment.

"double contour" images: Liu MQ, Chen HM, Yap AUJ, Fu KY. Oral Surg Oral Med Oral Pathol Oral Radiol 2012

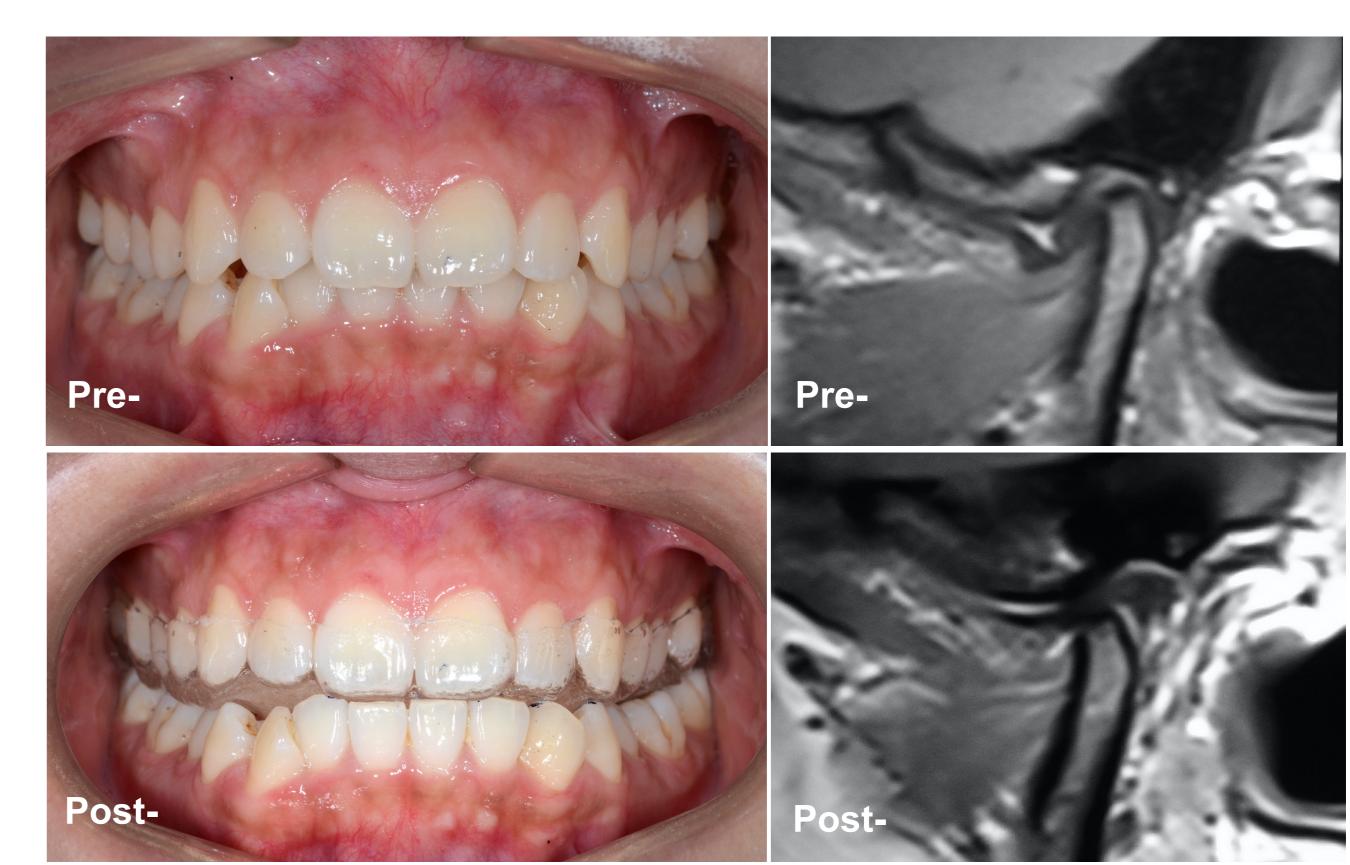


Figure 5 Mandibular and disc positions pre- and post-ARS therapy.

Table 1 Comparison of condylar osseous changes between treatment groups.

	Progressed(%)	Unchanged(%)	Repaired(%)	Regenerated(%)	P
Splint group	3.1(1/32)	18.8(6/32)	28.1(9/32)	50.0(16/32)	<0.001
Control group	37.1(13/35)	14.3(5/35)	48.6(17/35)	0(0/35)	

For the 14 joints in the splint group that required physical TMJ closed-lock reduction, 85.7%, (12/14) exhibited new bone formation.

Conclusions

- 1. Condylar repair and regeneration are possible with ARS therapy in adolescents/young adults with early-stage TMJ DJD.
- 2. Ideal spatial disc-condyle relationships appear important in condylar repair and regeneration.
- 3. The possibility of restoring TMJ form/structure by ARS therapy presents an attractive area of new basic science and clinical research.