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MRI Alone Versus MRI-CBCT Registered Images to Evaluate Temporomandibular Joint Internal Derangement.

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Purpose: To evaluate the effect of the MRI-CBCT image registration on improving the inter- and intra-examiner consistency when evaluating temporomandibular joint (TMJ) internal derangement compared to MRI alone.

Methods: MRI and CBCT images of 25 patients (50 TMJs) were obtained and co-registered using mutual-information rigid image registration via Mirada XD software (Mirada Medical, Oxford, UK). Two experienced radiologists independently and blindly evaluated two types of images (MRI alone and MRI-CBCT registered images) at 2 times (T1 & T2 for TMJ internal derangement based on sagittal and coronal articular disc position in relation to the head of condyle and posterior slope of the articular eminence).

Results: The intra-examiner consistency in MRI alone (examiner 1 = ICC 0.85[0.74-0.92]; examiner 2 = ICC 0.91[0.84-0.95]) was lower than the MRI-CBCT registered images (examiner 1 = ICC 0.95 [0.91-0.97]; examiner 2 = ICC 0.97 [0.96-0.99]). The inter-examiner consistency of evaluating the internal derangement in MRI alone (ICC = 0.52 [0.18-0.73] at T1; 0.71 [0.45-0.84] at T2) was lower than the MRI-CBCT registered images (ICC= 0.97 [0.95-0.98] at T1; 0.98 [0.96-0.99] at T2).

Conclusions: The MRI-CBCT registered images improved the intra- and inter-examiner consistency to evaluate the internal derangement of TMJ.