



Reliability of Simple Radiographic Parameters for Pincer FAI

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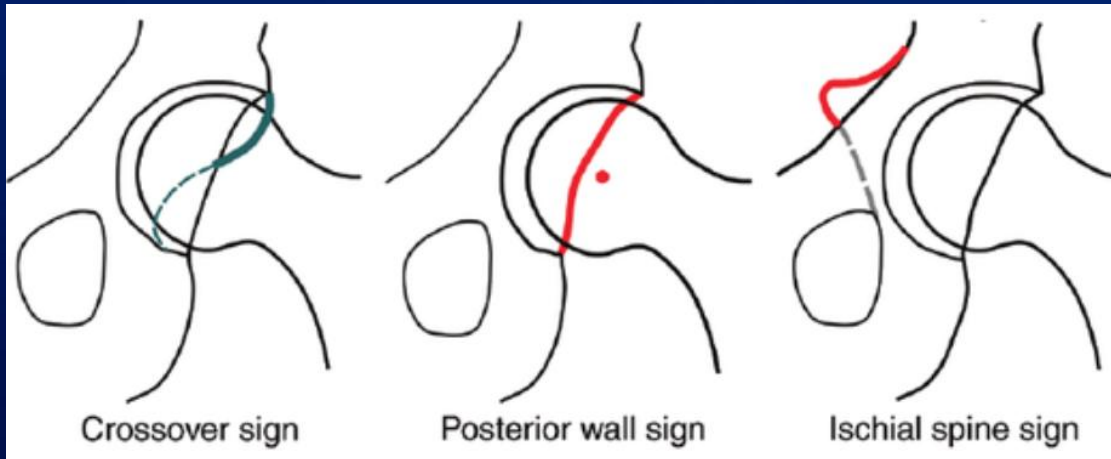
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We have no financial relationship to disclose



Radiographic Parameter of Pincer

- Acetabular orientation



Is x-ray based parameters reliable?



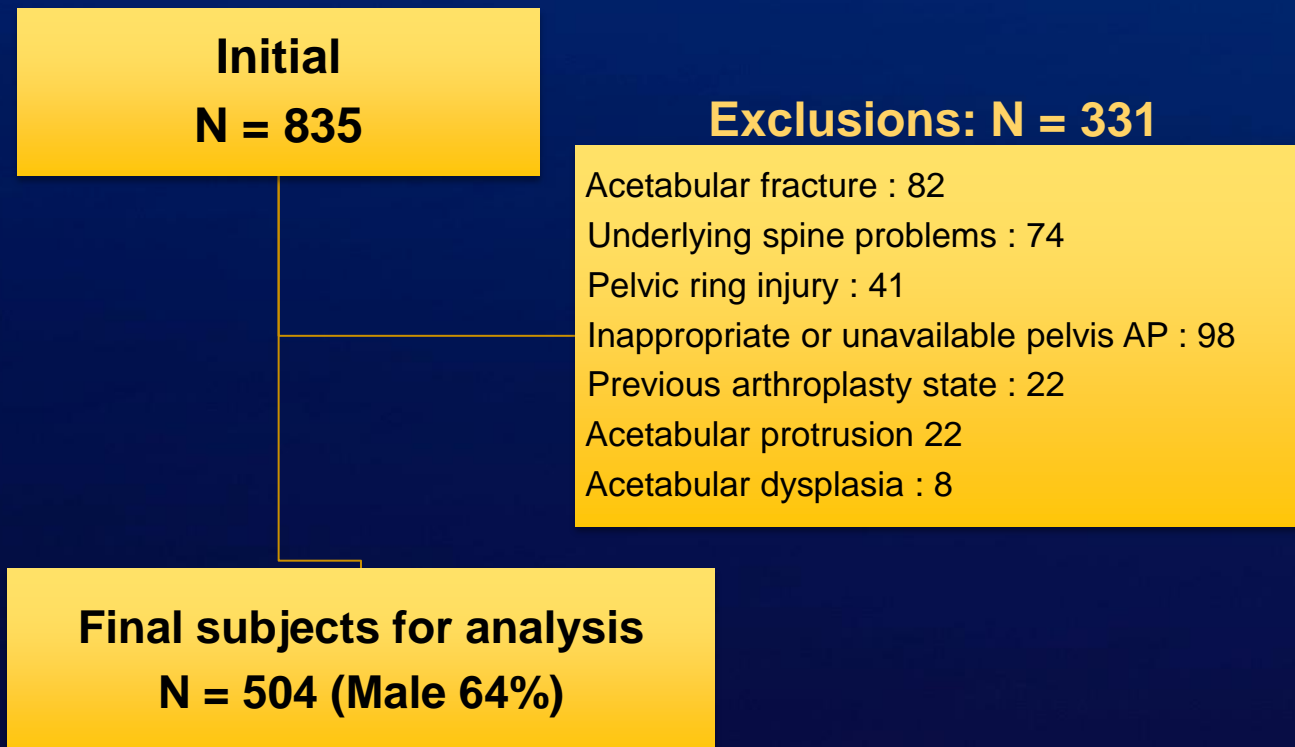
Purpose

- 1. Validate the reliability of radiographic parameters of pincer FAI for detecting acetabular orientation by comparison with CT
- 2. Report the overall prevalence in the Korean Population



Materials and Methods

- **Subjects** : patients between 18 to 60 years who visited our ER due to trauma event and has taken pelvis CT



Assessment

- Prevalence of pincer parameters (cross over sign, ischial spine sign, posterior wall sign) in pelvis AP
- Independent measurement by two orthopaedic surgeons
- Third reviewer assessment for any disagreement

Statistic

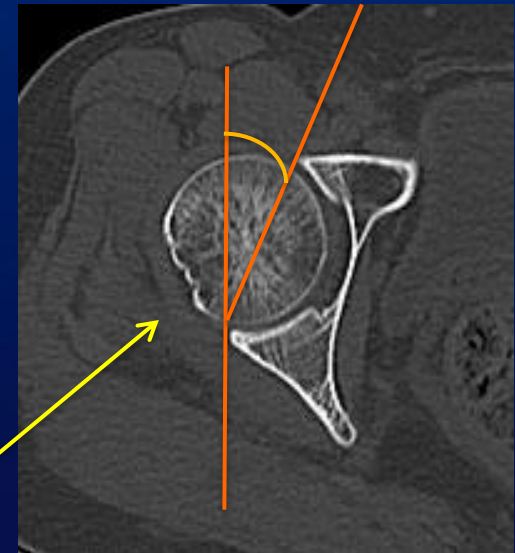
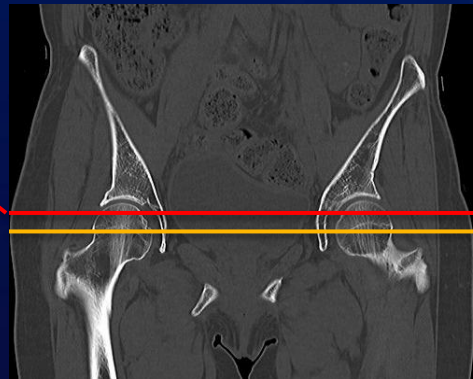
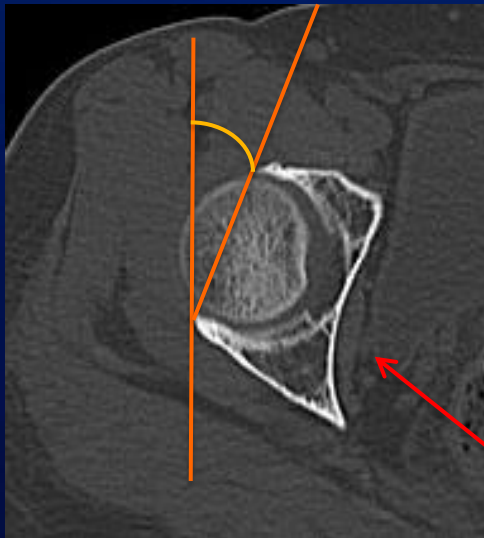
- JMP software (SAS, NJ, USA)
- Inter-observer correlation, kappa value for each parameters



CT Assessment

- Cranial anteversion

- Central anteversion



Results

	Overall prevalence	Interobserver correlation (Kappa value)
Cross over sign (%)	18.4	0.790
Ischial tuberosity sign (%)	16.3	0.920
Posterior wall sign (%)	17.9	0.921
Cranial anteversion (°)	12.9 ± 7.4 (6.9%)	0.873
Central anteversion (°)	17.8 ± 4.5 (3.8%)	0.886



Results

	Cranial retroversion*		Central retroversion**	
	Sensitivity (%)	Specificity (%)	Sensitivity (%)	Specificity (%)
Cross over sign	66.7	83.5	50	84.2
Ischial tuberosity sign	83.3	83.1	55.6	83.7
Posterior wall sign	66.7	84.1	44.4	84.6

*Cranial retroversion defined as anteversion < 8degrees

** Central retroversion defined as anteversion < 13 degrees



Conclusion

- Except for the **ischial tuberosity sign** the sensitivity of detecting retroversion of acetabulum was low
- **Specificity was relatively high for all parameters** for detecting both cranial and central retroversion
- The radiographic prevalence of pincer in Korean population ranges **16 to 18% with simple radiography parameters** and **4 to 7% with CT**



Reference

- Bardakos NV, Villar RN. Predictors of progression of osteoarthritis in femoroacetabular impingement: a radiological study with a minimum of ten years follow-up. *J Bone Joint Surg Br.* 2009;91:162–169.
- Chakraverty JK, Sullivan C, Gan C, Narayanaswamy S, Kamath S. Cam and pincer femoroacetabular impingement: CT findings of features resembling femoroacetabular impingement in a young population without symptoms. *AJR Am J Roentgenol.* 2013;200:389–395.
- Clohisy JC, Carlisle JC, Beaule PE, Kim YJ, Trousdale RT, Sierra RJ, Leunig M, Schoenecker PL, Millis MB. A systematic approach to the plain radiographic evaluation of the young adult hip. *J Bone Joint Surg Am.* 2008;90(suppl 4):47–66.
- Diesel CV, Ribeiro TA, Scheidt RB, Macedo CA, Galia CR. The prevalence of femoroacetabular impingement in radiographs of asymptomatic subjects: a cross-sectional study. *Hip Int.* 2015;25:258–263.
- Fukushima K, Uchiyama K, Takahira N, Moriya M, Yamamoto T, Itoman M, Takaso M. Prevalence of radiographic findings of femoroacetabular impingement in the Japanese population. *J Orthop Surg Res.* 2014;9:25.
- Ganz R, Parvizi J, Beck M, Leunig M, Notzli H, Siebenrock KA. Femoroacetabular impingement: a cause for osteoarthritis of the hip. *Clin Orthop Relat Res.* 2003;417:112–120.
- Kang AC, Gooding AJ, Coates MH, Goh TD, Armour P, Rietveld J. Computed tomography assessment of hip joints in asymptomatic individuals in relation to femoroacetabular impingement. *Am J Sports Med.* 2010;38:1160–1165.
- Kapron AL, Anderson AE, Aoki SK, Phillips LG, Petron DJ, Toth R, Peters CL. Radiographic prevalence of femoroacetabular impingement in collegiate football players: AAOS Exhibit Selection. *J Bone Joint Surg Am.* 2011;93:e111
- Ranawat AS, Schulz B, Baumbach SF, Meftah M, Ganz R, Leunig M. Radiographic predictors of hip pain in femoroacetabular impingement. *HSS J.* 2011;7:115–119.
- Nepple JJ, Martel JM, Kim YJ, Zaltz I, Clohisy JC; ANCHOR Study Group. Do plain radiographs correlate with CT for imaging of cam-type femoroacetabular impingement? *Clin Orthop Relat Res.* 2012;470:3313–3320.

