Introduction:
The purpose of this study was to compare morphometric hip parameters assessed via plain radiography and MRI. The hypothesis was that MRI delivers equal results to standard x-ray measurements for lateral center edge angle (LCE) and anterior center edge angle (ACE).

Methods:
One hundred and three cases (103 hips from 103 patients) from a surgical database who had MRI and X rays between Jan. 1, 2007 and Sept. 1, 2010 were re-evaluated for this retrospective study. The inclusion criteria were met a) if a clinical signs of femoroacetabular impingement (FAI) (positive hip impingement sign and restriction of hip motion) or developmental dysplasia of the hip (DDH) were present, b) if both preoperative 3D isotropic True-FISP MRI and radiographs (anterior-posterior (AP) and false profile view) were present. Patients with prior surgery with metal implants in the hip of interest were excluded.

The DDH group consisted of 57 hips in 57 patients (5 male, 52 female, age range 13-54 years and mean age at surgery 26.5 years), the FAI group of 46 hips in 46 patients (23 male, 23 female; age range 14-54 years; mean age at surgery 27.1). LCE and ACE were measured manually from radiographs and MRI.

Results:
Lateral center edge angle (LCE): The mean LCE values of all four straight coronal slices were compared to the x-ray measurements on AP radiographs. The MRI measurement on the most anterior slice (ant-10mm) was most similar to the x-ray LCE angle (13.8º±16.4 vs. 14.6º±13.4 respectively; p=0.27). All other coronal slices (ant-5mm, center, and post-5mm) showed higher mean LCE angles on MRI than on x-ray (+1.1º, +2.1º, and +1.4º respectively; all p<0.05).

Anterior center edge angle (ACE): The ACE angles on false profile views were compared to straight sagittal and 25º-oblique sagittal MRI slices. The straight sagittal MRI slices demonstrated markedly higher mean ACE values (47.6º±15.8, 47.0º±12.9, and 43.8º±18.9; medial to lateral) than the x-ray (19.9 º±17.6; all p<0.001). The ACE angles on oblique sagittal MRI slices (40.0º±14.7, 32.6º±16.6, and 24.1º±18.1; medial to lateral) were closer to the mean value of the x-ray, however, still considerably higher (all p<0.001), Figure 2.

Conclusion:
By comparing angle measures on x-ray and MRI, we demonstrated that there can be a considerable difference between both modalities. In particular the ACE angle measured on false profile views is different to anterior coverage measured on sagittal or oblique-sagittal MRI reformats.

Significance:
Clinicians should be aware that radiographic angle measurements of the hip can be different on x-ray and MRI.