A classification-system improves the intra- and interobserver reliability of radiographic diagnosis of "pistol-grip-deformity".

Abstract: Early detection of pistol-grip-deformity may be beneficial in optimising the outcome and the cost effectiveness of surgery. It is important to identify reliable radiographic parameters in assessing femoro-acetabular impingement (FAI) to develop a treatment algorithm. Radiographs of 47 patients ranging from "pistol grip deformity" to a normal head-neck-junction were measured for alpha angle and head ratio, and then classified by two different observers. The Bland-Altman plot was used for inter- and intraobserver agreement of alpha angle and head ratio. Inter- and intraobserver agreement for classification of "pistol grip deformity" was determined using weighted Cohen's kappa coefficient. Observer I achieved a kappa coefficient of 0.97. Observer II achieved a kappa coefficient of 0.92. An interobserver kappa coefficient between 0.87 and 0.92 was achieved by using a classification system. By testing for interobserver agreement, a bias of -0.004 with an upper limit of 0.461 and a lower limit of -0.47 was seen for the ratio and a bias of -3.7 with an upper limit of 17.2 and a lower limit of -24.6 for the alpha angle. Therefore, poor results were seen for intra- and interobserver reliability by using only a single plane for classification of "pistol grip deformity". The strength of agreement could be improved by using a classification system (based on two planes).