

Precision and Accuracy of Identification of Anatomical Surface Landmarks Amongst 30 Expert Hip Arthroscopists

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Summary:

This study evaluates the ability of 30 independent expert hip arthroscopists to identify common surface landmarks used in the hip specialty practice by comparing examiner applied landmark tags with ultrasound verified anatomic tags.

Abstract:

Introduction:

Anatomic surface landmarks around the hip and lower abdomen are frequently referenced for placement of arthroscopic portals and office based injections. It is currently unknown to what degree surgeons are capable of reproducibly identifying these landmarks. This study evaluates the ability of 30 independent expert hip arthroscopists to identify common surface landmarks used in the hip specialty practice by comparing examiner applied landmark tags with ultrasound verified anatomic tags. Five surface landmarks on a test patient were identified: anterior superior iliac spine, anterior inferior iliac spine, psoas tendon at the joint, superficial inguinal ring, tip of greater trochanter.

Methods:

The subject was independently examined by each surgeon in the supine position and colored tags were applied corresponding to the anatomic surface landmark. Overhead and lateral digital photographs were taken to document the position. An expert ultrasonographer also completed an examination with a specialized musculoskeletal ultrasound and placed tags. All surgeons were compared with the ultrasound standard for accuracy and the precision of the group was also determined.

Results:

Average distances from the examiner marks to ultrasonographer marks were: 31mm medial-distal for ASIS; 26mm medial-distal for AIIIS; 35mm medial-distal for psoas tendon; 19mm lateral-distal for superficial inguinal ring; 24mm anterior-proximal for tip of greater trochanter. Statistical analysis demonstrated examiners were greater than 10mm from the ultrasound markers. Examiner distribution showed most precision for the ASIS with variance over 18mm x 36mm area and the least precision for the superficial inguinal ring (51mm x 74mm area). Scattergram plots of deviation patterns showed common directional miscues amongst examiners.

Discussion / Conclusion:

The wide variance between ultrasound guided landmarks and examiner landmarks suggest a role for ultrasound in improving accuracy of identification. Experienced examiners demonstrate variable precision in identification of commonly referenced anatomic landmarks and this should be considered when describing arthroscopic techniques and portals.