Background: Persistent groin pain without clinical signs is a difficult diagnostic problem. Some patients have occult inguinal herniae, but others have musculotendinous injuries not necessarily requiring surgery. No existing imaging modality is sufficiently sensitive to reliably distinguish the two. Therefore the negative surgical exploration rate is high. Interventional Magnetic Resonance units (IMR) allow real-time imaging in physiological positions and during muscular exertion. This study aimed to develop a new non-invasive imaging technique which combines soft tissue imaging capabilities of MR with real time dynamic assessment of groin structures to aid differentiation between the two conditions.

Materials and Methods: Fifty patients (44 males, 6 females) were studied in a 0.5T General Electric Signa SP10 IMR. Four had obvious inguinal herniae, one a cord haematoma following previous hernia repair, one a lump in the groin and 44 occult groin pain without physical signs, 10 of whom had undergone groin surgery in the past. Static imaging (T1/T2 FSE), FSPGR and STIR sequences were performed supine in both axial and sagittal planes for detailed anatomical examination and differentiation of structural from inflammatory lesions. Dynamic real time imaging (FSPGR, acquisition time 2s) was then performed supine and kneeling at rest and during a Valsalva manoeuvre.

Results: Forty-eight patients tolerated the procedure. The sac and defect in the fascia transversalis were clearly seen in T1 FSE and FSPGR images in the 4 obvious herniae. The sacs could be seen moving in and out of the defect on dynamic imaging. STIR images were normal. The cord haematoma was differentiated from recurrent hernia by a normal FT and high signal on T2 and STIR imaging. Of the remaining 43 patients without physical signs, imaging revealed occult hernia in 7 patients which was confirmed at surgery. In ten patients both imaging and surgical exploration revealed no abnormality. Twenty one patients had high STIR signals in the posterior rectus, adductor tendons or conjoint tendon consistent with muscular injury, and no hernial defects. These patients were treated conservatively. Four patients had a saphena varix which was treated surgically and one patient had iliac lymph nodes and was diagnosed to have lymphoma.

Conclusion: This study has indicates that dynamic MR imaging shows promise for investigating patients with unexplained groin pain. It can detect and differentiate both clinically apparent and occult groin herniae from musculotendinous injuries. This may reduce the negative surgical exploration rate for such patients in the future.