

How to spot osteonecrosis of the femoral head after internal fixation of femoral neck fractures in younger patients, with implants in situ? Conventional x-ray versus MARS-MRI.

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Background

Osteonecrosis of the femoral head (ONFH) is a well-known complication after fixation of femoral neck fractures (FNF). Little is known on the use of metal artifact reduction sequence (MARS) MRI, to diagnose post-traumatic ONFH with conventional metal implants present. Our primary aim was to compare MARS-MRI with conventional x-ray in diagnosing ONFH. Secondly, to determine if signs of ONFH on MARS-MRI correlates with patient reported outcomes (PROs) via Oxford Hip Score (OHS), and pain (VAS).

Material/methods

30 of 44 adults <60 years treated with internal fixation after FNF at Odense University Hospital or Skåne University Hospital, 2015-2018, were included. Follow-up: X-rays and PROs at 4 months, 1, 2 years; MARS-MRIs at 4 months and 1 year. OHS <34 and/or VAS pain >20 mm was considered clinically relevant.

Results

At 1 year, 14 patients had pathological MRI. 3 of them had ONFH on x-ray at 1 year, increasing to 5 at 2 years. 5/14 had unfavorable PROs. In the 5 patients with ONFH signs on both MRI and x-ray, 2 had unfavorable PROs. 10 patients had all normal MRIs, all of them had normal x-rays. 1/10 had unfavorable 2-years-PROs. 5 patients had inconsistent MRI-results, of which 1 developed ONFH. 1 patient dropped out.

Interpretation/Conclusion

A normal MRI signals uneventful healing. In our cohort, information from a pathological MRI was not useful, as a majority remained free from radiological ONFH and symptoms. Furthermore, PROs did not correlate with imaging result. MRI-MARS findings must be better understood before taken into clinical practice.