Endo-anal ultrasound versus endo-anal magnetic resonance imaging for the depiction of external anal sphincter pathology in patients with faecal incontinence: a systematic review

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CRD summary
This review concluded that ultrasound and magnetic resonance imaging were comparable for diagnosis of external anal sphincter defects in patients with faecal incontinence. Given limitations in the review and available evidence, a large degree of variation across studies and discrepancies throughout the review, the conclusions and implications for practice seem overstated and are unlikely to be reliable.

Authors' objectives
To compare endo-anal ultrasound and magnetic resonance imaging (MRI) for the diagnosis of external anal sphincter defects in patients with faecal incontinence.

Searching
PubMed, EMBASE, CINAHL and the Cochrane library were searched for published studies from 1980 to March 2007; search terms were reported. Bibliographies of included studies were searched.

Study selection
Studies that evaluated endo-anal ultrasound and MRI for diagnosis of external anal sphincter defects in patients with faecal incontinence were eligible for inclusion.

Ultrasound and MRI technology used varied across studies. Only a small proportion of patients had the external anal defect verified by surgery. Where reported, Vaizey score and Park grading were used to assess incontinence, incidence of prior surgery ranged from 4% to 30% and the median parity was between 2 and 3. The proportion of women in the studies was not reported.

Two reviewers selected studies for the review; it was unclear whether or not selection was independent.

Assessment of study quality
Study quality was not assessed.

Data extraction
Incidences of external anal defects identified by ultrasound, MRI and surgery were extracted. Relative risks (RR) and 95% confidence intervals (CI) were calculated.

Two reviewers extracted data that was checked by a third reviewer.

Methods of synthesis
Summary relative risks and 95% CI were calculated for ultrasound, MRI and ultrasound/MRI combined versus surgery and ultrasound versus MRI. The authors used the error sum of square method to determine whether a fixed-effect or random-effects model was required; where neither model fitted the data correctly, a fixed-effect model was used. Results of the meta-analyses were presented for the random-effects model.

Results of the review
Five comparative studies met the inclusion criteria (n=347, range 18 to 237): four studies were prospective and one was retrospective. Three studies compared both ultrasound and MRI to surgery and each other; two studies compared ultrasound with MRI only.

Surgery was better than ultrasound (RR 0.88, 95% CI 0.84 to 0.92; three studies, 61 patients) and MRI (RR 0.75, 95%
CI 0.66 to 0.84; three studies, 61 patients) for detecting external anal defects. When ultrasound was compared directly with MRI, there was no overall difference between the technologies (RR 1.01, 95% CI 0.93 to 1.09; five studies, 347 patients). MRI was more accurate than ultrasound in patients where defects were validated by surgery (RR 0.83, 95% CI 0.77 to 0.89; three studies, 61 patients). Highly statistically significant heterogeneity was observed for all analyses. Using surgery as the reference standard, sensitivity was approximately 88% for ultrasound and 75% for MRI.

Authors' conclusions
Ultrasound and MRI were comparable for the diagnosis of external anal sphincter defects in patients with faecal incontinence.

CRD commentary
The authors addressed a clear review question with well-defined inclusion criteria. Several relevant sources were searched; however, only published studies were included and it was unclear whether language restrictions were applied, so relevant studies may have been missed. Methods were employed to reduce error and bias during study selection and data extraction.

There was no assessment of the quality of the included studies. Insufficient study details were provided to allow a thorough assessment of study quality or any judgment on the generalisability of the results. All analyses showed highly significant statistical heterogeneity; it was apparent from the few (insufficient) study details reported that clinical heterogeneity was present. It seemed that only 42% of patients had anal defects verified by surgery, which was considered by the authors as the accepted gold standard. Although sensitivity was mentioned, it was unclear why standard diagnostic accuracy outcomes were not more fully reported as it appeared that 2x2 data were available. There were several discrepancies between text and figures and the presentation of forest plots was poor, which made interpretation of the results difficult. These factors made the reliability and generalisability of the pooled results uncertain. The cost effectiveness of the technologies was not assessed.

Given the limitations of the review and available evidence and the large degree of heterogeneity across studies, the conclusions and implications for practice are unlikely to be reliable.

Implications of the review for practice and research
Practice: The author stated that since ultrasound is an economical, quicker and more easily available technology, it may be preferable for the diagnosis of external anal sphincter defects in patients with faecal incontinence.

Research: The authors stated that a multicentre randomised trial was required to determine the accuracy of these technologies for diagnosis of external anal sphincter defects.

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