

PEDIATRICS

Diffusion-weighted MRI, not ultrasound, for nonpalpable undescended testes

Ultrasonography cannot reliably localize nonpalpable undescended testes, but a combination of conventional MRI and diffusion-weighted imaging (DWI) should be recommended, according to two recent studies, published in *Pediatrics* and the *American Journal of Roentgenology*.

Cryptorchidism affects 1–3% of term infant boys, and management is determined by the palpability of the undescended testis. If the testis is not palpable, surgical exploration is used to determine the position of the testis or to confirm that it is absent. Ultrasound scanning is frequently used by urologists attempting to localize the undescended testis, in order to prevent unnecessary surgery.

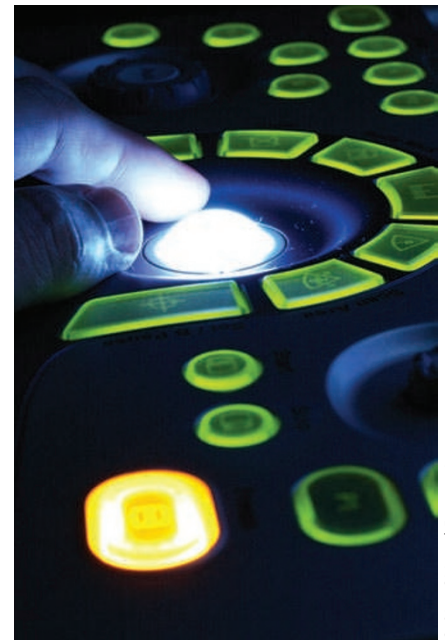
Gregory Tasian and Hilary Copp from the University of California, San Francisco, conducted a meta-analysis to investigate whether ultrasonography is clinically useful in locating nonpalpable undescended testes. The sensitivity of ultrasound to localize a nonpalpable testis was 45%, with 78% specificity. The site of the undescended testis had a bearing on the benefit of ultrasound—the sensitivity and specificity of ultrasound to detect inguinal-scrotal testes were 52% and 88%, respectively, compared to 44% and 93%, respectively, for intra-abdominal testes. Overall, ultrasound was poor at localizing nonpalpable undescended testes, as it was unable to differentiate nonviable nubbins from inguinal tissue,

and was adversely affected by the presence of bowel gas. There was also a significant risk of an intra-abdominal testis being present even though ultrasound scans suggested that this was not the case.

A group from Atatürk University, Turkey, investigated the diagnostic performance of DWI and MRI in detecting and localizing nonpalpable undescended testes. They used both techniques to image boys with cryptorchidism, with all images reviewed independently by two radiologists. All patients then underwent a laparoscopy to determine the actual location of any nonpalpable testes.

Laparoscopy identified 19 intracanalicular testes, 11 low intra-abdominal testes and 4 high intra-abdominal testes. A combination of DWI and MRI enabled the accurate identification of 31 testes by reviewer 1 and 30 by reviewer 2, with a sensitivity and accuracy of 0.91 and 0.88 and 0.92 and 0.86, respectively. Using DWI alone, these values dropped slightly, with 30 and 28 testes visualized by reviewer 1 and reviewer 2, respectively, and both radiologists identified 29 testes using MRI alone.

Taken together, these studies suggest that a combination of DWI and MRI is the most accurate means of detecting and localizing nonpalpable undescended testes, especially compared to ultrasonography, which has little clinical benefit. Both techniques are noninvasive and do not use ionizing radiation.



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DWI and MRI as a first-line imaging technique, in place of ultrasonography, could reduce the need for laparoscopic surgery in boys with cryptorchidism.

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Original articles Tasian, G. E. & Copp, H. L. Diagnostic performance of ultrasound in nonpalpable cryptorchidism: a systematic review and meta-analysis. *Pediatrics* doi:10.1542/peds.2010-1800 | Kantarci, M. et al. Diagnostic performance of diffusion-weighted MRI in the detection of nonpalpable undescended testes: comparison with conventional MRI and surgical findings. *AJR Am. J. Roentgenol.* 195, W268–W273 (2010)