

PEDIATRIC UROLOGY

Abnormal dimercapto-succinic acid scans predict an increased risk of breakthrough infection in children with vesicoureteral reflux

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Purpose: The management of high grade vesicoureteral reflux remains controversial, with breakthrough infections being an indication for surgical repair. We sought to determine if technetium dimercapto-succinic acid (DMSA) scan could help predict which children are at risk for breakthrough urinary tract infection.

Materials and Methods: A retrospective review was performed on children presenting with a febrile urinary tract infection and prenatal hydronephrosis who were found to have vesicoureteral reflux and underwent a DMSA scan. Reflux was tabulated according to the highest grade. DMSA results were graded as 0-normal, no parenchymal or size defects, grade 1-focal parenchymal defects or less than a quarter of a renal unit involved, or grade 2-severe defects to include at least half of a renal unit, bilateral defects or unilateral atrophy.

Results: A total of 120 consecutive patients were evaluated. An abnormal DMSA scan was documented in 57 (33 females and 24 males), and 35 with grade 1 and 22 with grade 2 defects. Of the patients 53 females and 10 males had a normal scan. Of the 57 children with an abnormal DMSA scan 6% presented with grades 1 and 2 vesicoureteral reflux, 24% with grade 3, 38% with grade 4 and 26% with grade 5. Of the children with grades 3 to 5 reflux 60% had a subsequent breakthrough infection. Of the 63 children with a normal DMSA scan 11% presented with grade 1 reflux, 28% with grade 2, 48% with grade 3, 11% with grade 4 and 2% with grade 5. Of these children 5 had a subsequent breakthrough infection.

Conclusions: An abnormality on DMSA scan in the presence of grade 3 to 5 reflux correlates with a greater chance of having a breakthrough infection (60%). We conclude that children with grade 3 to 5 vesicoureteral reflux and an abnormal DMSA scan are at increased risk for breakthrough urinary tract infection.

Editorial Comment

It has been clearly demonstrated that DMSA scanning is a highly sensitive modality for detecting renal scarring. In particular, it has many advantages over renal ultrasound for this purpose. On the other hand, it is expensive and in terms of cost-effectiveness, the utility of DMSA scanning for determining renal injury in children with reflux has been questioned. In particular, it is important to determine whether the results of DMSA scanning alter management or outcome.

This study looks at differences in outcome of children with reflux based on the results of DMSA scanning. Of 120 children evaluated, 57 had abnormal scans, including 33 girls and 24 boys. In contrast, of the 63 normal scans, only 10 were boys. Furthermore, in follow-up, 60% of those with an abnormal DMSA scan had a breakthrough UTI whereas only 8% of those with a normal DMSA had a breakthrough infection.

The implications of these data are significant. First, as anticipated, boys with reflux have more renal injury, perhaps related to more abnormal neonatal voiding patterns with high intravesical pressures that are passed to the kidney. Second, those who already demonstrated a tendency to renal injury (because of either more abnormal voiding or a host resistance problem that results in a greater rate or more severe UTIs) are more likely to get further UTIs. Not only is this important in the pathophysiology of reflux and reflux nephropathy,

but it suggests that more aggressive management of reflux in this population may be warranted. This in turn suggests value in obtaining a DMSA scan in children with grades 3-5 reflux.

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Vaginal construction using sigmoid colon in children and young adults

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Objective: To evaluate the age at which patients who required vaginal replacement (an uncommon procedure in children) were diagnosed, and the cause of their anomaly, and to relate these variables to the surgical outcome.

Patients and Methods: Patients who had vaginal replacement at the author's institution between 1990 and 2002 were reviewed retrospectively. Depending on the age at reconstructive surgery, patients were divided into pre- and post-pubertal groups. **Results:** A neovagina was constructed in 23 patients during the study period; sigmoid colon was used in 20 but not in two patients with cloacal exstrophy and in one with Mayer-Rokitansky-Kuster-Hauser syndrome (MRKHS). These cases were excluded from the analysis of outcomes and complications. Group 1 comprised patients diagnosed and treated before puberty and group 2 those diagnosed and/or treated afterward. In group 1 the presenting diagnoses included androgen insensitivity syndrome (AIS) in six patients, MRKHS in two, cloacal exstrophy in two, vaginal tumour in one, Mullerian duct renal aplasia cervicothoracic somite dysplasia, vertebral abnormalities, anal atresia, cardiac anomalies, tracheo-oesophageal fistula, and/or oesophageal atresia, renal abnormalities and limb defects syndromes in one each. In group 2 the presenting diagnoses included MRKHS in seven, AIS in two, and congenital adrenal hyperplasia in one. Complications included superficial wound infection (two patients), recurrent introital stenosis, and blind loop mucocele, complete stenosis of perineal neovaginal opening (one each) and dyspareunia in three. Neither age nor pelvic habitus (android vs gynaecoid) influenced the outcome, and the cosmetic results were excellent in all the patients.

Conclusion: Isolated sigmoid neovaginal construction appears to be applicable to many diagnoses and in patients at any age. Although an android pelvis can present technical challenges, in this experience it was not associated with a greater complication rate. The long-term satisfaction with the sigmoid neovagina for intercourse, especially in those constructed before puberty, still requires long-term evaluation.

Editorial Comment

Vaginal reconstruction is an uncommon procedure, but carries special significance when done. It is, of course, most common in patients with some form of intersex and involves the genitalia, both of which raise the anxiety level of parents considerably. Moreover, the type of reconstruction varies considerably by specialty, with plastic surgeons and gynecologists generally recommending skin graft/dilation procedures and pediatric urologists recommending bowel vaginoplasty. Furthermore, the timing of the reconstruction remains highly controversial.

This is an interesting review that helps the reader in several ways. First, I believe that it provides the reader with a realistic estimate of the potential complications of bowel vaginoplasty. Three patients out of 20

had introital stenosis (of course these were quite fixable) and all three who are sexually active suffered from dyspareunia. Fortunately this was not severe enough to prevent sexual activity, but nonetheless, this would be important to mention in preoperative counseling. Interestingly, in the authors hands, bowel vaginoplasty was no more risky in children who were pre-pubertal (mean age 4) than in those who were post-pubertal. This is likely because these patients did not require dilation postoperatively. When using techniques that require dilation postoperatively, the procedure should surely be postponed until after puberty.

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