

ULTRASOUND OF THE KIDNEYS IS AN ALTERNATIVE TO VOIDING CYSTOURETHROGRAPHY TO DETERMINE VESICORENAL REFLUX IN CHILDREN WITH NEUROGENIC BLADDER DYSFUNCTION

Aims of Study

The pediatric vesicoureteral reflux guidelines panel of the American Urologic Association urged for the development of techniques of voiding cystourethrography (VCU) that result in less radiation exposure. In Children with neurogenic lower urinary tract dysfunction (NLUTD) urodynamic and radiologic evaluation has to be performed regularly to avoid reflux nephropathy. We combined ultrasound with VCU to evaluate reflux and upper urinary tract lesions.

Methods

36 children with a median age of 8.3 a (0.85-16) were included. 33 had a NLUTD due to spina bifida, 1 bladder extrophy, 1 isolated tethered cord, 1 spinal cord injury and 1 of unknown origin. All had intolerable high intravesical pressure over 35 cmH₂O or a history of vesicorenal reflux. Initially ultrasound of the kidneys and an abdominal x-ray were performed with an emptied bladder. Next standardized video urodynamic was performed using isotone contrast media. With the maximum bladder capacity reached ultrasound of the kidneys and abdominal x-ray was repeated. Vesicorenal reflux proofed by ultrasound was defined as a new dilatation or an increase in preexisting dilatation of the renal pelvis after the bladder was filled compared to the empty bladder. Vesicorenal reflux on VCU was graded according to the International Reflux Study Classification.

Results

Urodynamic evaluation showed pathological findings in all cases. The maximal detrusor pressure was a mean of 58,9 cmH₂O ([plusminus] 24.9 SD), compliance was found to be a 11.8 cmH₂O (\pm 12.6 SD) and the leakage point pressure was 54.3 cmH₂O (\pm 29.8 SD). Vesicorenal reflux was found by ultrasound in 23 patients. In 15 kidneys the reflux was seen on the left side and in 17 on the right side. 9 patients had bilateral reflux. In contrast, the VCU revealed a reflux in 9 patients on the left side and in 1 patient on the right side, 1 patient had bilateral reflux. In all cases showing reflux in the VCU it was apparent using ultrasound. In 2 cases sonography confirmed bilateral reflux but the VCU proofed only a unilateral defect. No correlation between the International Reflux Study Classification and reflux in ultrasound was verified.

Conclusions

Urodynamic evaluation combined with VCU is a helpful tool to determine upper urinary tract lesion in children with NLUTD and to avoid renal dysfunction. Renal ultrasound in this setting revealed even more vesicorenal refluxes than VCU. Thus we believe that VCU is no longer needed for the evaluation of upper urinary tract lesion in children.