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Intrarenal reflux

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Case

A 5-year-old girl was admitted with fever and diurnal enuresis. In her medical history, she had numerous recurrent urinary tract infections; however, she was not evaluated with radiological methods. Urinalysis revealed pyuria and the urine culture grew >100 000 *Escherichia coli*. Urinary ultrasonography showed that the left kidney was smaller than the right kidney, with a longitudinal kidney diameter 60 mm and 75 mm, respectively. DMSA renal scintigraphy also revealed contraction of the whole left kidney, while the right kidney was normal. There was reduced function on the left kidney, contributing to total renal function of only 17%. Voiding cystourethrogram performed 4 weeks after infection revealed left grade 4 vesicoureteral reflux with intrarenal reflux (IRR) and right grade 3 vesicoureteral reflux without IRR (Figure 1).



Fig. 1. Voiding cystourethrogram showing grade 4 vesicoureteral reflux with intrarenal reflux (arrows) on left and grade 3 vesicoureteral reflux without intrarenal reflux on right sides.

Discussion

IRR is pyelotubular backflow (from the renal pelvis into the collecting ducts) of urine. IRR is fundamental to the understanding of reflux-associated renal scarring. Vesicoureteral reflux alone does not cause renal damage, but IRR provides a mechanism whereby any pathogenic organisms that might be present in the bladder urine can gain access to the renal parenchyma and initiate infection and subsequent scar formation [1]. However, IRR does not occur at every renal papilla and the reason for this lies in the morphology of individual papillae. Simple papillae that do not allow IRR to occur have conical structures with a convex calyceal surface, onto which the papillary ducts open obliquely with slit-like orifices. In contrast, compound papillae that fuse into larger papilla with flat or concave tips and have papillary ducts opening onto calyx with gaping orifices do allow IRR to occur. In one-fifth of all human kidneys, 30% of

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the papillae are potentially refluxing [2]. The presence of IRR is a high risk factor for renal scarring, which is an important cause of chronic renal failure and hypertension in childhood.

Conflict of interest statement. None declared.

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