

OBSTRUCTION

OBSTRUCTION IN CHILDREN*

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The causes and natural history of outflow obstruction in children are quite different from those in adults and must be considered separately. The commonest cause of obstruction in boys is posterior urethral valves and in girls ectopic ureterocele. Neuropathic bladder is a close second in both sexes. Primary bladder neck obstruction is rare in either sex. The following list gives the commoner and rarer forms of obstruction.

- Posterior urethral valves
- Ectopic ureteroceles
- Neuropathic problems
- Stricture, diverticulum, valves of anterior urethra
- Duplications of the urethra
- Primary bladder neck obstruction
- Prune belly syndrome
- Stones

Investigation

In addition to urography modern investigations include ultrasound, nuclear scintigraphy and micturating cystography. Cystoscopy may also be necessary, not so much diagnostically but as part of the therapy to treat the obstruction. The two main causes of obstruction in children are now discussed separately.

Posterior urethral valves

Valves present a wide spectrum from very severe obstruction with almost total destruction of the kidneys to a milder form that can easily be overlooked. As part of the assessment of the boy with valves the following anatomical sites must be considered: the valve itself, the bladder neck, the uretero-vesical junction and the pelvi-ureteric junction. The renal function must also be carefully measured as the prognosis depends not only on the degree of the original obstruction but also on the degree of dysplasia of the kidneys and the occurrence of vesicoureteric reflux. The efficacy of the treatment must also be assessed postoperatively. Persistent proteinuria has now been shown to be a bad prognostic sign.

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Management of valves

Micturating cystography demonstrates the valve in the vast majority of boys. It also demonstrates the presence of reflux and the appearances of the bladder neck. A nuclear scan is the best method of determining the overall renal function as in the younger child intravenous urography can be extremely unhelpful. As soon as the child is sufficiently stable the valve should be destroyed using a small resectoscope hook or electrode, or alternatively we have recently been using an insulated hook passed along the urethra under local anaesthetic at the time of the initial micturating cystogram. This can be a very effective and simple way of dealing with the valve itself.

After destruction of the valve no more should be done until the situation is reassessed in a few days' time. If there is severe unilateral reflux into a non-functioning kidney, the child should undergo a nephro-ureterectomy as persistent reflux into a non-functioning kidney nearly always leads to urinary tract infections which are difficult to treat. Otherwise, the reflux associated with posterior urethral valves is often best left unoperated until the situation can be reassessed several months later. If there is any doubt at all about the patency of the uretero-vesical junction then a pressure flow study should be performed to assess this area carefully. The upper tracts of most boys with posterior urethral valves are best watched and treated conservatively, and over a number of years the dilatation and tortuosity often improve.

Ectopic ureterocele

The obstruction by an ectopic ureterocele is primarily to the ectopic ureter itself. However, the ipsi- and contralateral ureters can be compressed and obstructed by the ureterocele as a secondary effect. A third possibility is that the ureterocele causes an outflow obstruction by obstructing the bladder neck. Dilatation of the whole upper urinary tract may be subsequent to this. These children should be assessed with these three possible obstructive sites in mind.

Types of management

1. *The classical approach.* The classical teaching for the management of ectopic ureterocele was to perform an operation on the bladder to excise the ureterocele and then to excise the whole of the ectopic upper urinary tract which of course included a partial nephrectomy. This is a major procedure for a small child and efforts have been made in recent years to find a simpler way of treating these children. However, we believe that this radical approach should still apply to those children with very large ureteroceles or ureteroceles that have prolapsed through the urethra.
2. *Partial nephrectomy only.* Recently a number of children have been treated with simple partial nephrectomy above the ectopic ureterocele and allowing the ureterocele itself to collapse against the bladder wall. We believe that this approach is

useful when there is no reflux associated with the ureterocele and when the ureterocele itself is relatively small. There is a 25% chance that the child will continue with infections or get other problems from the ureterocele and eventually will need an excision of the lesion itself.

3. *Initial rupture of the ureterocele.* On occasions when the whole of the ectopic system is full of pus it is necessary to release the pus as an emergency, and this can be done either as a resection of the ureterocele or percutaneous drainage of the upper moiety. However, this method should be avoided if at all possible because it does commit the child to a full radical approach at a later date. If the ruptured ureterocele is left alone it acts as a large bladder diverticulum with all the usual problems.

4. *Re-implantation.* In the rare event of there being a worthwhile functioning upper moiety a reimplantation of the ureter is sometimes justified after excision of the ureterocele.

The management of a ureterocele should be planned after taking all of the above factors into consideration.

DISCUSSION

Bölükbaşı: What is the oldest case you have come across in your posterior urethral valve group and have you had any patients with bladder neck contracture together with posterior urethral valves?

Whitaker: The oldest case I ever saw was actually at the Institute of Urology when I was working there. He was a boy of 24. I think it interesting that he was cystoscoped by three quite experienced people and nobody could actually see the valve; it was only finally when Mr Earnest Williams, who's a pediatric surgeon, was asked to see the child that the valves were demonstrated; and that just shows you how very difficult they are to see. I have not seen a child with true proven bladder neck obstruction in the presence of valves.

Bölükbaşı: In the literature I have read about a very few cases of hypertrophy, in which hypertrophied fibers were shown in the specimen.

Whitaker: Well I would have to have it proved dynamically. I think you'd have to show that there was a high pressure which there may well be but you'd also have to show a low flow rate; if you could show that, then perhaps you would try to do something. But the facts are that if you cut the bladder neck you've got something like a 30% chance of incontinence.

Bölükbaşı: I have a special case in mind; a 28-month-old uremic patient came with obstruction. I drained him and then did a urethrography on him, and then a TUR for the urethral valves and the bladder neck.

Whitaker: Honestly I don't feel you should touch the bladder neck, at least not the first time round. Deal with the valve, but leave the bladder neck alone. I can't say that too emphatically.

Dajani: In the X-ray you showed after 20 years of pull-out, the result really was excellent, but how sure can we be that the results will be good without any interference? I'm really worried here about the damage to the kidney during this period.

Whitaker: Well what I'd say to that is, there are only 2 causes of damage to the kidney from a surgical point of view. One is definite proven obstruction with a high pressure, and you can prove that with a pressure — flow study, and the second is persistent infection, and I do accept that some of the ones that aren't obstructed may be chronically infected, and that can be a problem; and maybe there's a place for those to be operated on; but my experience, and most people's experience of trying to reimplant a ureter into a thick-walled bladder that's been obstructed for a long time, is disastrous.

Özen: I wanted to ask two questions. First of all I want to put forward a hypothetical case. A boy with a posterior urethral valve and bilateral reflux. How long would you wait to see if the reflux will heal spontaneously? Or, in other words, when would you operate on the uretero-vesical junction?

Whitaker: I think the answer to that probably is, if the child's progressing well and infection isn't a problem, then don't. Perhaps, when they're teenagers, there may be some reason to do so, but we just have not really reimplanted any ureters. The unilateral ones — they lose the kidney, so that's easy; the bilateral ones we've just left alone and some of them perhaps a third, have stopped on their own, and the rest of them we've just left and we've got a fair number still refluxing.

Özen: The other question concerns nephrectomies in cases of non-functioning kidneys. We don't have much experience with posterior urethral valves but we have of urolithiasis and uretero pelvic strictures. We leave the kidney alone even in a pyonephrotic state, when there are stones and that kind of disorder. Do you think that the difference is due to the specific disorder — posterior urethral valves?

Whitaker: I think you've got a very large diverticulum of the bladder; you've got reflux, which you may not have in a stone case and you've often got a fairly high pressure bladder; I wouldn't perhaps remove the kidney if the child were well, but most of them are in fact sick with infection, and the only way you can get rid of the infection is to take the kidney out. And certainly the ones I can remember have been dramatically better after having the kidney removed. It does seem to help.