

THE INVESTIGATION AND MANAGEMENT OF THE MEGAURETER*

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Some years ago we felt that there was considerable confusion in the terminology of the megaureter and we put forward a classification¹ that we believed clarified the subject. This was subsequently adopted with minor modifications by an international panel². This classification is now widely used and puts the primary obstructive megaureter into perspective. First reflux and bladder outflow obstruction must be proved or excluded and second the degree of obstruction in the lower ureter, if any, must be quantified.

If the urographic appearances of a megaureter are examined there are several questions that need to be asked. First, is the megaureter doing any harm or will it do harm to the patient later? Second, is it obstructed or is it simply dilated but unobstructed and leading to stasis with the likelihood of infection? Furthermore, can we in fact improve it by operating or might we make it worse in our attempt? To answer some of these questions we must look at the transport mechanisms within the normal ureter. It becomes clear that peristalsis is only effective if a bolus is formed within the ureter and transmitted along the length of the organ. If there is no occlusive peristalsis then the pressure within the whole system is equal and any rise in pressure caused by minimal obstruction is transmitted back to the kidney itself. In the presence of a minor degree of lower ureteric dilatation peristalsis can be occlusive above this level, and the kidney is thus protected.

A second factor that may lead to worsening of the megaureter itself is the fact that the kidney, as it grows, produces a greater volume of urine, and this increased flow rate with a fixed amount of resistance leads to a greater pressure and hence to self-perpetuating worsening of the renal function. Thus I am suggesting that peristalsis has, to a certain extent, a protective role. Peristalsis has an important role when one considers the effect of tapering the lower ureter at the time of surgery. In effect a "pelvi-ureteric junction" is being produced low down in the ureter that allows peristaltic emptying of the ureter which in turn keeps the pressure normal, above this segment.

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Clinical aspects

If there is doubt about the presence or absence of obstruction then further investigations are necessary; a simple intravenous urogram is not enough. Renography may help but percutaneous pressure flow studies are often needed as the final arbiter³. They provide the actual pressure within the kidney which can be compared with the pressure in the bladder, and the differential pressure at any given flow rate can be calculated. It has been shown that this test gives a valuable assessment of the degree of obstruction⁴. Determination of the degree of obstruction is important from a clinical point of view because if a non-obstructed system is operated upon no radiological benefit can be expected.

The absence of reflux does not prove obstruction and conversely the presence of reflux does not disprove obstruction. There is a group of ureters that allow reflux and yet are also obstructed.

Primary and Secondary Megaureter

According to the classification that was mentioned above, ureters can be wide and obstructed as a single congenital anomaly that can be unilateral or less often bilateral. Alternatively, ureters can be wide secondary to a bladder outflow obstruction and in this situation they are usually bilaterally wide. The typical examples in the second category are children with posterior urethral valves or bladder neck obstruction from a neuropathic bladder. In this secondary type of megaureter the highest priority is to rid the patient of the outflow obstruction and then see if the dilatation improves. If it does not then the uretero-vesical junction can be assessed independently for an obstructive element. Again pressure studies are useful here. In the author's experience it is very unusual to find a true element of uretero-vesical obstruction in the presence of posterior urethral valves but conversely any child with persistent dilatation after destruction of a valve must have a dynamic assessment of that particular area before any further surgery is contemplated.

It is sometimes difficult at the time of operation to decide whether or not to taper the lower ureter. The megaureter that is obstructed has considerable powers of recovery and provided that the tunnel ratio of 1:5 can be achieved then it is best not to interfere with the size of the lumen. It is rarely necessary to taper a lower ureter nowadays as it can be "keeled" instead; this allows considerable reduction in the diameter but without any excision of tissue.

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A QUESTION

Barlas: What is your experience with the prune-belly syndrome?

Whitaker: Well, I think you really cannot just put all boys with prune belly syndrome into the one category. There are really three types at least. I think there is a policy, really, that everybody follows who deals with a lot of them and that is you must leave them alone entirely if you can at all. I would be very loath even to do a mic-turating urethro cystogram on a child with prune-belly because that is usually the point at which the child first gets infected, and all the problems then stem from there. So if I could prove, maybe by ultra-sound or in some other way, that the child was emptying satisfactory and that the renal function was stable, I would suggest that you do absolutely nothing at all. The moment you start draining or reimplanting, you are heading for disaster. And it's simply a question of the material, the poor ureters. Would you disagree?

Barlas: No, I'd agree.