Lower Urinary Obstruction in Infancy

A Review of Lesions and Symptoms in 165 Cases

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Tsingoglou, S., and Dickson, J. A. S. (1972). *Archives of Disease in Childhood*, 47, 215. **Lower urinary obstruction in infancy. A review of lesions and symptoms in 165 cases.** This paper reviews 165 cases of lower urinary obstruction in infancy. The commonest lesions were posterior urethral valves (91) and ectopic ureterocele (34), stenosis or atresia of the urethra (8), and bladder neck obstruction (6). There were 12 different diagnoses in the remaining 26 cases. The commonest presenting features were general in nature (110), and of these, failure to thrive and vomiting (87) were most frequent. The commonest urinary signs and symptoms were palpable bladder (93) and urinary infection (90).

An accurate diagnosis was obtained by intravenous pyelography or cystourethrography.

Treatment was directed to correction of electrolyte and water disturbances, followed by early relief of the obstruction.

The mortality rate was 32.5% for children admitted in the first month of life, and only 8% thereafter, with an overall rate of 18%.

The commonest cause of renal failure in the first year of life in Britain is a congenital abnormality of the urinary tract (Lloyd-Still and Atwell, 1966). Among these, lower urinary obstructions form a large group of potentially curable lesions with similar presenting features.

The term lower urinary obstruction is used to include all lesions at or below the bladder neck which interfere with normal urine flow.

165 patients with a lower urinary obstruction were admitted to The Hospital for Sick Children, under the care of Mr. Innes Williams, from 1959–1970. There were 130 boys and 35 girls. The ages at presentation are shown in Fig. 1. A peak incidence in the first 2 weeks of life with a rapid decline in numbers with increasing age is shown as would be expected in a group of congenital lesions. The numbers of the other obstructive lesions are shown to follow closely the pattern of those for posterior urethral valves which have been shaded in the figure.

FIG. 1.—Histogram to show ages of children on arrival at hospital. The first month further subdivided in left hand figure. Cases of posterior urethral valves indicated by shading.

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Lesions

The lesions involved are shown in Table I. The sex distribution is shown for each of the conditions. The large number of cases of posterior urethral valves in boys is almost entirely responsible for the preponderance of males in the total figures. Obstructive-neuro-

TABLE I
Obstructive Lesions

Diagnosis	Total	Male	Female
Posterior urethral valves	91	91	0
Ectopic ureterocele	34	7	27
Stenotic-atretic urethra	8	8	0
Bladder neck obstruction	6	5	1
Anterior urethral diverticulum	5	5	0
*Pelvic mass	5	1	4
Bladder diverticulum	4	4	0
Intersex with vulval obstruction	2	0	2
Acute haemorrhagic cystitis	1	1	0
Rhabdomyosarcoma of prostate	1	1	0
Utricular cyst	1	1	0
Posterior urethral polyp	1	1	0
Urethral calculus	1	1	0
Double urethra	1	1	0
Hypospadias	1	1	0
Phimosis	1	1	0
No diagnosis	2	1	1
Total	165	130	35
*Pelvic masses			
Presacral teratoma	1	0	1
Presacral cyst	2	0	2
Pelvic abscess	2	1	1

genic bladder and obstructions associated with anorectal abnormalities have been deliberately excluded from this survey. Ectopic ureteroceles have only been included where there was definite evidence of urethral obstruction as well as obstruction in the ureters from the affected kidney. The small number of bladder neck obstructions reflects the decreasing acceptance of this diagnosis as an independent entity.

Symptoms and Signs

These have been grouped together (as it is debatable whether a baby can have symptoms) and arranged in two tables, those of a general nature (Table II), and those suggesting urinary tract disease (Table III). A further subdivision of each table separates the presenting symptom from the total signs and symptoms. These show that though nearly all the infants had signs or symptoms suggesting the diagnosis of urinary obstruction, in particular acute or chronic retention of urine, or urinary infection, the majority of presenting symptoms were in the general group, with failure to thrive being the commonest.

The extent of the failure to thrive is shown in Fig. 2 in which the distribution of the birthweights of the 122 babies for whom this was recorded is compared with the weight expressed as centiles (Tanner, Whitehouse, and Takaishi, 1966) of the 84 infants admitted over the

TABLE II
Signs and Symptoms—Nonurinary

	Presenting Signs and Symptoms	Total Signs and Symptoms
Failure to thrive	45	65
Vomiting	33	70
P.U.O.	11	34
Abdominal distension	13	25
Respiratory symptoms	5	5
Anaemia	1	1
Fits	1	8
Abdominal pain	1	12
Irritability	0	8
Peripheral oedema	0	2
Diarrhoea	0	3
Rectal prolapse	0	1
Jaundice	0	1
'Renal' ears	0	1
	110/165	236

TABLE III
Signs and Symptoms—Urinary

	Presenting Signs and Symptoms	Total Signs and Symptoms
Acute retention	11	20
Dribbling micturition	13	54
Palpable kidney	2	71
Palpable bladder	10	93
Haematuria	5	8
Urinary infection	3	91
'Absent' abdominal wall muscles	4	4
Vaginal discharge	2	3
Prolapsed ureterocele	3	3
Intersex	1	2
Extravasation of urine after inguinal exploration	1	1
Palpable ureters	0	4
Hypospadias	0	3
Megalopenis	0	2
Swelling of penis	0	1
	55/165	360

age of 1 month for whom this was known. Whereas only 9 babies (7%) were under 2.5 kg at birth, 41 babies (just under half) were below the 10th centile and only 17 (20%) were over the 50th centile for weight at the time of presenting.

Diagnosis

The plan for investigation of these children has been outlined by Barratt (1971) and the radiological investigation by Chrispin (1968). In this group the diagnoses were established by combined use of intravenous pyelography and voiding or expression cystourethrography. The risks of introducing infection by catheterization should be borne in mind and the cystourethrogram only performed when it is possible to proceed to immediate relief of any obstruction found.

FIG. 2.—Histogram to show: Left—Birthweight in kg of 122 babies. Right—Weights expressed as centiles of 84 children over 1 month of age on presentation.

Management

In this series, which may serve as a baseline for future work, treatment has followed conventional lines with correction of dehydration and acidosis followed by relief of the obstruction. Present management now includes peritoneal dialysis, the indications for which are still being defined but depend more on the expected outcome of drainage of the urinary system than absolute plasma urea or electrolyte levels.

Catheterization or suprapubic cystostomy are contra-indicated. In the more severe obstructions where the bladder has hypertrophied and there is dilatation of the ureters, simply emptying the bladder may result in ureterovesical clampdown leaving the child still in urinary obstruction. Where the child's condition demands immediate relief of the obstruction, it is safer to drain the urinary system by either bilateral nephrostomies or bilateral cutaneous ureterostomies and proceed to definitive correction of the underlying abnormality later.

Results

Until the full results of a survey involving more detailed assessment of the renal function which will include the glomerular filtration rate (Barratt and Chantler, 1970) and urea and creatinine clearances,

TABLE IV
Mortality Rate

	No. of Cases	Deaths	Mortality (%)
All cases	165	30	18
Cases under 1 month	68	22	32.5
1 month to 1 year	97	8	8
Urethral valves, all cases	91	21	23

the crude mortality rate with a minimum follow-up of one year is the best available criterion for assessment. The results are given in Table IV.

The mortality rate is highest in those cases admitted in the first month of life. While there remains a group with irreversible lethal renal damage, the present survival rate is encouraging, and there are prospects of improving this with earlier diagnosis of the mild cases and more precise management of the early acute cases.

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