Urinary complications of lipomyelomeningocele

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Sokol, G. M., and Schwartz, M. W. (1973). *Archives of Disease in Childhood*, 48, 560. **Urinary complications of lipomyelomeningocele.** A review of 22 cases of lipomyelomeningocele was conducted with special reference to the urinary system. 13 patients (60%) had evidence of urinary tract infection. 10 urological x-rays were abnormal. Surgical removal of the lipomyelomeningocele had no effect upon the severity of the urological complications. The high incidence of infections in these patients requires special attention to the urinary system. Urinary tract problems may initially be absent, but can appear at the time of growth at the end of the first decade.

Although urinary tract problems in patients with myelomeningocele have been well described and investigated (Graf *et al.*, 1964; Harlowe *et al.*, 1965; Cooper, 1967; Bucy, 1971), little emphasis has been placed on the evaluation of the urinary system or the long-term comprehensive follow-up of patients with lipomyelomeningocele.

There are scattered published reports of the incidence of infection (Dubowitz, Lorber, and Zachary, 1965; Lassman and James, 1967). Dubowitz *et al.* (1965) mentioned that 8 of 12 patients with lipomyelomeningocele had urinary infections. The association has not been stressed, and often the problems have been overlooked. Consequently, a study of the urinary complications of patients with lipomyelomeningocele at this hospital from 1958 to 1971 was undertaken.

Lipomyelomeningoceles are defects of the neural tube which usually arise in the lumbosacral area. A hole exists in the meninges through which the spinal cord evaginates. Associated with this defect is a lipoma which arises from the spinal cord and grows into the subcutaneous tissue. Lipomyelomeningoceles present clinically as soft tissue masses in the lower spine or buttock area that are covered by a layer of skin. Diagnosis may be made by myelography with diffusion of the contrast material from the subarachnoid space into the area of the soft tissue mass. In about 50% of the cases only a small sinus tract, a remnant of the lipomyelomeningocele connecting the lipoma to the spinal cord, will be seen at operation (Bruce and Schut, 1971).

Material and method

The records of 25 patients with a diagnosis of

lipomyelomeningocele in this hospital from 1958 to March 1971 were reviewed, with special attention to urinary problems. The patients ranged in age from 5 days to 14 years. There were 17 females and 8 males. All patients had surgical removal of the lipomatous material. 3 patients did not have complete urological investigation, and were not included in this study.

A short questionnaire was sent to the parents of each patient inquiring about the status of the urinary system of their child. Finally, outpatient visits, urine culture, and renal x-rays were obtained from several patients.

Results

Urinary tract infections were diagnosed by a positive urine culture (more than 100,000 colonies of a pure growth). Radiological changes of infection such as dilatation, scars, and atrophy were used as evidence of infection. Changes in the bladder wall and poor emptying were noted. Cystoscopy was not performed. Residual urine was not measured by catheterization, but residual urine was noted on the post-voiding bladder studies. Routine urine analyses were not reliable since they were frequently normal when the urine culture was positive.

Of 22 patients, 13 (60%) had an infection of the urinary tract proven by positive culture or abnormal radiological studies (Table I). 6 patients had both

TABLE I

Results of investigation of urinary tract infection

Patients	22	
Total infections	13 (60%)	
Abnormal x-rays and positive cultures		6
Abnormal x-rays and sterile cultures		4
Normal x-rays and positive cultures		3
Total		13

positive cultures and abnormal intravenous pyelograms (IVP) and cystourethrograms. 4 patients had sterile urine cultures and abnormal x-rays. 3 patients had positive urine cultures and normal radiographical studies.

Of 10 abnormal x-ray studies, 6 showed normal kidneys with abnormal findings limited to the bladder (Table II). These changes, trabeculations,

TABLE II
Comparison of abnormal x-rays and cultures

Case no.	X-ray	Cultures
1	Bladder dysfunction, retention	Many positive
2	Thick-walled bladder	<i>Esch. coli</i>
3	Large bladder, retention	<i>Esch. coli</i>
4	Poor emptying	Sterile
5	Thick-walled bladder	Sterile
6	Right kidney destroyed	Sterile
7	Poor bladder emptying	25% positive
8	Hydronephrosis	Sterile
9	Severe pyelonephritis	Many positive
10	Bladder trabeculations	Many positive

poor emptying, or atonic bladder, were typical of those seen with total or partial denervated bladder.

Of the 4 patients with renal parenchymal damage, 3 had severe destructive changes by age 2 years. In one girl the renal changes did not appear until age 8. She had several positive urine cultures and a normal kidney x-ray at age 5. However, at age 8 she developed neurological changes in her lower extremities and advanced pyelonephritic changes. The appearance of muscle weakness and cord bladder symptoms was related to longitudinal body growth and traction on the spinal cord.

In addition, 1 patient had congenital absence of the right kidney and a bifid left kidney. The urine culture was sterile.

The following case report illustrates the potential severity of the urinary complications of lipomyelomeningocele.

Case report

A 3-month-old female was first admitted to this hospital in 1958 with a chief complaint of a lump on the right buttock, present since birth. She moved her legs well and was said to have normal bowel and bladder function. Physical examination was unremarkable except for an ill-defined 2 to 3 cm cystic mass in the superior medial quadrant of the right buttock. An exploratory operation revealed a lipomyelomeningocele. At this time, a urine analysis was normal.

She was readmitted at 6 months of age. There had been no change in the size of the lesion since the previous admission. The stool pattern had remained normal,

with 4 to 5 formed bowel movements per day. She occasionally dribbled urine, but there was no history of urinary tract infection. Sensation and movement in the lower extremities remained normal. A myelogram was performed, revealing a small meningocele at the end of the subarachnoid space. The onset of a viral infection delayed operation until a later date.

At 10 months of age, she was readmitted and a lipomyelomeningocele was removed. A routine urine sediment showed 35 to 45 WBC/hpf with abundant bacteria. A clean-catch urine analysis revealed 2 to 4 WBC/hpf. After this operation, she did well for about 6 months, at which time the parents noticed the onset of urinary frequency. A urine culture revealed more than 100,000 colonies of *Esch. coli*. She was placed on sulphafurazole (Gantrisin) but the infection was resistant to it. Nitrofurantoin (Furadantin) and oxytetracycline (Terramycin) were tried in turn, without success. IVP showed almost total destruction of the right kidney, and she was admitted for the fourth time for removal of the right kidney. Urine analysis before surgery showed 40 to 50 WBC/hpf with many bacteria. Postoperative urine culture was negative.

Discussion

This study shows the high incidence of urinary complications in patients with lipomyelomeningocele. It is similar to the 60% incidence of urinary infections of patients with myelomeningocele (Graf *et al.*, 1964; Cooper, 1967). The lack of concern regarding the urinary tract in this group is contrasted with the emphasis and multiple studies carried out on children with the more common myelomeningocele. The findings here indicate that both groups should have the same meticulous investigations and treatment.

The timing of the discovery of the infection must be stressed. In this study, there were 3 patients in whom complete urological tests were initially normal, and several years later the symptoms occurred. Longitudinal growth and traction on the cauda equina can result in neurological deficit and bladder dysfunction.

At the time the lipomyelomeningocele is diagnosed, a urine culture and IVP and cystourethrogram should be obtained. Once a urinary infection has been found, radiological studies should be performed every other year, or more often if repeated urinary infections are found. The continuous monitoring of these patients' urinary tracts should consist of serial urine cultures, even in asymptomatic cases. If a child has a fever whose origin cannot be readily determined, a urine culture should be obtained. Only in this way may permanent and disabling damage to the urinary tract be prevented.

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