

RUPTURE OF THE URETHRA CAUSED BY A CALCULUS

REPORT OF A CASE *

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Rupture of the urethra is usually associated with external trauma either as a result of a blow onto the perineum or in association with a fractured pelvis. Rupture of the urethra with extravasation of urine caused by a urinary calculus must be extremely rare and the following case is therefore reported:

H. K. (59/9779), a boy aged 8 years, was admitted to the Hacettepe Children's Hospital on 19/7/1959. The boy was said to have been unwell for about two years, but had had no urinary symptoms until three days prior to admission, since when he had been unable to pass any urine. Lower abdominal pain accompanied the retention. There was no history of trauma of the perineum or abdomen. The past history and family history revealed nothing of significance.

On examination this was a pale, wasted and rather dehydrated boy weighing 17 kilos. There was a pigeon chest deformity and a severe scoliosis together with clinically obvious rickets. The anterior abdominal wall was oedematous and the oedema extended to both flanks; the penis and scrotum were very oedematous, but there was no oedema below the inguinal ligament; i. e. the distribution was the classical one of extravasated urine. The bladder was distended to about five fingers above the symphysis pubis and was tense and tender when first seen by one of us (K.M.), but one hour later the bladder definitely could not be felt. However in that time the oedema in the flanks had markedly increased. There was no evidence of trauma in the perineum. Catheterisation was attempted but a soft rubber catheter could not be passed more than 5 cm.

The diagnosis of extravasation of urine resulting from a rupture of the urethra, possibly caused by a calculus, was made on clinical grounds.

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Investigation

A plain radiograph of the abdomen confirmed the oedema in the abdominal wall and there was a very faint shadow compatible with a urethral calculus.

Haemoglobin : 6.75 gm %
N. P. N. : 106 mgm %
Blood CO₂ : 10.5 mEq/lit
Chlorides : 106 mEq/lit
Blood group : O Rh (+).

A blood transfusion was commenced and the boy was prepared for operation which began five hours after his admission. By this time the bladder was again distended and easily palpable.

Operation

Surgeon H. B. Eckstein; general anesthetic Dr. A. Atabaş.

The abdomen was opened through a vertical midline incision. The bladder was found to be thick walled and trabeculated and contained some 500 cc of clear urine (which later proved to be sterile on culture). The bladder neck was found to be widely dilated and a finger could easily be inserted into the proximal urethra. At this stage a metal sound was carefully passed into the urethra from the external meatus; this entered the bladder easily but no stone could be felt. Dilators could also be passed in a retrograde fashion. As soon as the bladder had been emptied urine could be seen coming out very freely from a normal looking left ureteric orifice but no urine came from the right orifice. Because of the boy's poor condition further exploration (to elicit the cause of the extravasation) was considered inadvisable and the bladder was closed around a large Pezzer catheter.

His immediate post-operative condition was satisfactory; the urine output was good, the scrotal oedema disappeared within three hours and the abdominal wall oedema had disappeared within sixteen hours.

On the second post-operative day the patient's condition deteriorated. In spite of a urine output of 1200 cc in 48 hours the blood N. P. N. rose to 130 mgm %; the temperature rose to 40° C while the haemoglobin, in spite of a transfusion of 350 cc of blood, had risen to only 8.6 gm %. He developed epistaxis and became comatose and, in spite of intensive antibiotic and cortisone therapy, died on 5/7/1959. A blood culture yielded a growth of *B. coli*.

Autopsy was carried out eleven hours after death (K. M.). The metaphyses were enlarged and the tibiae were bowed, consistently with severe rickets. There were pneumonic changes in the right upper

lobe and the liver showed advanced fatty degeneration. The left kidney was enlarged and moderately hydronephrotic and the left ureter was slightly dilated. A soft calculus was found in the left ureter two centimeters above the ureteric orifice. The right kidney was small and atrophic and the capsule could be stripped only with difficulty. The bladder wall was hypertrophied.

The urethra was dilated and at the peno-scrotal junction there was a rent in its upper surface leading to a small cavity containing a hard stone, one centimeter in diameter. There was necrosis of the tissues around the stone, but no pus.

The stone, on chemical analysis, was found to contain uric acid only.

The cause of death was considered to be septicaemia.

Discussion

There can be little doubt that the stone had ulcerated through or perforated the urethral mucosa and caused extravasation of urine into the tissues. An interesting point in this case was that the bladder definitely appeared to have emptied while the child was under observation in hospital prior to operation and the increase in the abdominal wall oedema associated with this suggests that the stone or urethral wall oedema diverted the entire urine into the tissues. The perineal oedema was no doubt responsible for the stone not being palpable even at operation.

As the urine output was good until just before death and as urine was actually seen squirting out of the left ureteric orifice the calculus in the left ureter was probably not directly contributory to death.

As the urine was sterile and as there was no pus around the urethral stone no origin for the *B. coli* septicaemia, the immediate cause of death, could be found. However we have found that a *B. coli* septicaemia without any obvious cause is a not uncommon, usually fatal occurrence in severely malnourished children.

Summary

A case of extravasation of urine following perforation of the urethra by a calculus is described. The patient died of a *B. coli* septicaemia.