

Renal Foreign Bodies

Unusual Cause of Hematuria and Pyuria

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MOST of the few patients on record with renal foreign bodies have been adults in whom bullets or shell fragments had penetrated the kidney through the skin. In the few children reported the portal of entry has usually been the mouth or the urethra, and hematuria or pyuria or both have been the most common findings.

The literature was well reviewed in 1940¹⁰ and again in 1953.⁹ There have been no reports in the pediatric literature for over 20 years.^{4,5} Two recent childhood patients with renal foreign bodies prompt this report.

Case 1. J. M. This two and one-half-year-old Caucasian boy was seen ten days prior to his admission to Tampa General Hospital by his family physician because of cold, cough, fever, and leg furuncles. Two days later the physician noted gross hematuria and right costovertebral angle tenderness. As treatment he prescribed sulfamethizole (Thiosulfil) 250 mg. four times daily for one week. There was gradual clearing of the gross hematuria, but microscopic hematuria persisted with 40 to 50 red blood cells per high power field. Past history and family history were unremarkable.

Examination on admission revealed a well developed, well nourished afebrile boy in no distress, and with no noteworthy abnormal findings. Pulse was 80, respiration, 22, blood pressure, 82/56. There were no abnormalities in the blood count.

Urinalysis: specific gravity, 1.025; albumin, 30 mg./100 ml.; sugar, negative; 2 to 4 white blood cells per high power field; 20 to 40 red blood cells per high power field; 3+ free hemoglobin. Assorted blood tests, including coagulation tests, were

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normal. BUN: 18 mg./100 ml.; serum creatinine: 0.3 mg./100 ml. Urine culture: no growth.

An intravenous pyelogram showed malrotation of the right kidney, and an opaque foreign body which pierced the second portion of the duodenum and was imbedded in the right kidney.

On surgical exploration the peritoneal cavity was free of changes. A "bobby-pin" type of hairpin had perforated the posterior wall of the second portion of the duodenum and entered the upper pole of the right kidney. Dense inflammatory adhesions were around the duodenum. The perirenal tissues and the kidney itself seemed grossly normal. The pin was pulled out easily, and the duodenum was closed. Postoperative course was uneventful. The urine became negative 24 hours after surgery.

Case 2. F. W. This four and one-half-year-old Caucasian boy came to the University Hospital Clinic with a four-day history of fever to 39° C., irritability, urinary frequency and pyuria. His physician had found the urine "loaded" with white blood cells two days previously.

Physical examination was normal with the exception of pain and tenderness in the left costovertebral angle. Urinalysis: specific gravity 1.012, trace of protein, 30 to 40 red blood cells per high power field and loaded with white blood cells and bacteria. Intravenous pyelogram: left kidney larger than the right and rounded protuberance along the lateral border of the left kidney. Hematocrit: 34; white blood cells: 14,900; BUN: 5 mg./100 ml. Urine culture: coagulase (+) staphylococcus and alpha-hemolytic streptococcus.

The initial therapy of sulfisoxazole diethanolamine was ineffective and was changed to nalidixic acid. Two days later a red, tender swelling was noted below the left costovertebral angle. Over the next three days this developed into a 3 × 4 cm. abscess. The urine culture remained positive and penicillin was added to the therapy.

On the seventh day the abscess drained spontaneously and a 2 × 90 mm. straight plastic broom-straw was removed by the patient's father from the

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TABLE 1. *Reported Cases of Foreign Bodies in Kidney (Children)*

Author and Year	Sex	Age	Foreign Body and Duration	Mode of Entrance	Side Involved	Symptoms
Blattsrom—1927 ²	M	13	2 grass straws Time?	Urethra	left	Hematuria
Blaine—1929 ³	F	42	Broken sewing needle From childhood	Urethra?	left	Colic since childhood
Capon and Wells—1938 ⁴	F	4	Bobby-pin 10 months	Swallowed	right	Frequency, hematuria
McEney and Fox—1946 ⁵	M	2	Bobby-pin 9 months	Swallowed	right	Pyuria
Mackby—1948 ⁷	F	3	Bobby-pin Time?	Swallowed	right	Pyuria, albuminuria
Bilger and Greiner—1949 ¹	M	5	Hair-pin 2-3 years	Swallowed	right	Pyuria
Macaulay and Moore—1955 ⁸	M	3½	Bobby-pin 4 months	Swallowed	right	Hematuria
Our case—1967	M	2½	Bobby-pin Time?	Swallowed	right	Hematuria
Our case 1967	M	4½	Broomstraw Time?	Urethra	left	Pyuria, hematuria

center of the abscess. This was pointed directly at the kidney. The child improved rapidly; the urine became sterile and the abscess healed. Two months later the kidneys appeared normal by x-ray and the urine was normal.

Discussion

In a review of 30 cases of renal foreign body, half of these entered through the skin, usually as a result of war casualties. Of the remainder, 11 foreign bodies were swallowed and five were assumed to enter through the urethra. Of these 30 cases, seven were children and are described with our additional two patients in Table 1. In the seven previously reported children, the foreign body was swallowed in five instances, entered through the urethra in one, and entered either through the urethra or through the skin in another.

In all of the patients with swallowed foreign body, the lesion and the foreign body were in the right kidney and the foreign body was metallic, usually a bobby-pin. In the one documented case of urethral entry, the foreign body was nonmetallic. For the adults in whom the foreign body entered through the urethra, there was no predilection for either side and the foreign body was rarely metallic.

In our first case, the passage of a bobby-pin through the duodenum into the right kidney is similar to other reported instances. In the second case, oral entry is unlikely since the

foreign body was in the left kidney and was nonmetallic. Entry through the skin or through the urethra is possible. Since the history is not compatible with skin entrance, it seems likely that the straw was introduced per urethra through some form of masturbatory activity. As early as 1869, Engelman demonstrated the possibility of foreign bodies moving antiperistaltically up the ureter.⁹ In favor of entrance through the skin, was the presence in the urine of staphylococci and streptococci which were more likely to have originated from the skin directly rather than to have been introduced per urethra.

The paucity of case material in the literature suggests that foreign bodies in the kidney, as a cause of hematuria and pyuria, should be rare. But this mechanism may be more common as attested to by the present cases. Thus, renal foreign bodies should be considered as a diagnostic possibility in the presence of otherwise inexplicable hematuria, bacilluria or pyuria in children.

References

1. Bilger, F. and Greiner, G.: Calcul de bassiniet chez un enfant de cinq ans développé autour d'un barrette ingérée vraisemblablement trois ans auparavant et ayant perforé le colon; guérison après nephrectomie. *J. Urol. Paris* 55: 259, 1949.
2. Blaine, E. S.: An unusual foreign object in the kidney. *Radiology* 12: 207, 1929.

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3. Blattstrom, E.: Nephrectomy with recovery for foreign body in kidney pelvis. *Acta Chir. Scand.* 62: 56, 1927.
4. Capon, N. B. and Wells, C.: A foreign body in the kidney. *Arch. Dis. Child.* 13: 85, 1938.
5. Engelmann, T. W.: Zur physiologie des ureter. *Arch. f. d. Ges. Physiol.* 2: 243, 1869; cited in Graves, R. C. and Davidoff, L. M.: Studies on ureter and bladder with especial reference to regurgitation of vesical contents. *J. Urol.* 10: 185, 1923.
6. Macaulay, D. and Moore, T.: A foreign body of the kidney. *Brit. Med. J.* 1: 205, 1955.
7. Mackby, M. J.: Foreign body in second portion of duodenum perforating pelvis of right kidney. *J. Mt. Sinai Hosp.* 14: 929, 1948.
8. McEnery, E. T. and Fox, P. F.: Foreign body in the duodenum causing urinary disturbance. *J. Pediat.* 29: 226, 1946.
9. Osmond, J. D.: Foreign bodies in the kidney. *Radiology* 60: 375, 1953.
10. Wilhelmi, O.: Foreign body in the kidney. *J. Urol.* 43: 182, 1940.

Salmonella Typhi Murium Meningitis in an Infant

Case Report

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SALMONELLA meningitis is not rare among infants.¹⁻⁷ The first case was reported by Ghon in 1907¹ and was caused by *Salmonella paratyphi B*. Several instances of meningitis due to Salmonella have been reported in Israel.^{8,9} All authors stress the poor prognosis, particularly among infants. We present here a successfully treated case.

Illustrative Case

History. A three-month-old boy was admitted to Beilinson Hospital after two episodes of apnea, fainting and cyanosis. His birth weight had been 3 Kg. and he had received a diphtheria-tetanus-

pertussis vaccination five days before admission. He was fretful the day following the injection; he became febrile and was treated by the family physician with penicillin because of bilateral otitis media. The apneic episodes within the few preceding hours led to his admission.

Physical Examination. The infant weighed 6.6 Kg. He was fully conscious, but irritable. His temperature was 38° C. and his anterior fontanelle was bulging. There was no neck rigidity, and Kernig's and Brudzinski's signs were negative. He exhibited bilateral otitis media and myringotomy released a sanguinous fluid. He was otherwise normal.

Laboratory Findings. His hemoglobin level was 8.5 Gm./100 ml. and his white blood cell count was 11,700/cu. mm. Cerebrospinal fluid was turbid, containing 133,000 white cells/cu. mm., mostly polymorphonuclear cells. Spinal fluid sugar level was 21 mg./100 ml. and the protein, 495 mg./100

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