Vanishing kidney disease

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To cite: Ghosh GC, Sharma B, Kamble U, et al. BMJ Case Rep Published online: [please include Day Month Year] doi:10.1136/bcr-2013-009117

DESCRIPTION
A 60-year-old woman with a known case of diabetes mellitus for last 25 years, presented to our emergency department with symptoms of severe colicky pain in the right lumbar region and paraumbilical region of abdomen and recurrent episodes of vomiting the day before admission. Her family doctor recently moved her on to insulin as her blood sugar was not being controlled by oral antidiabetics. Systemic examination was normal except for severe tenderness in right lumbar and paraumbilical regions. Random blood sugar was 364 mg/dL, arterial blood gas analysis revealed metabolic acidosis and urine was positive (+++) for ketones. A diagnosis of diabetic ketoacidosis was made and an intravenous normal saline and intravenous insulin infusion was started. Within 6 h of admission, her blood sugar level came within the normal range, metabolic acidosis subsided and urine ketones became negative; however, pain in abdomen and vomiting still persisted. Routine urine examination revealed pus cells of 15–20/high power field, and few epithelial cells. Complete blood count revealed haemoglobin 13.4 g%, total leucocyte count 16 700 cells/mm3, differential count showed shift to left, with neutrophils 91%, platelets were adequate. A urine culture after 24 h revealed growth of Escherichia coli, which was sensitive to piperacillin and tazobactum and amikacin, so we immediately changed the antibiotics accordingly. A plain X-ray of the abdomen revealed an oval-shaped gas shadow in the right side of the abdomen (figure 1). An ultrasonography of abdomen was unable to delineate the right kidney properly and an urgent contrast-enhanced CT was performed which revealed features suggestive of right emphysematous pyelonephritis (figure 2A,B). We consulted with our urology department and a percutaneous nephrostomy was performed but the patient’s condition gradually deteriorated and she expired on the seventh day after admission. Emphysematous pyelonephritis is a rare necrotising pyelonephritis with a variable clinical picture ranging from mild abdominal pain to septic shock. It is a life-threatening condition that usually affects

Figure 1 Plain X-ray of the abdomen (erect position) showing an oval-shaped gas shadow in the right side of the abdomen.

Figure 2 Contrast-enhanced CT scan of the abdomen showing gas infiltrating renal parenchyma and perirenal space (A) in cross-sectional view (B) in coronal view.
patients with diabetes, and a small percentage may be due to urinary tract obstruction.\(^1\) A plain X-ray of the abdomen often show mottled gas shadows over the affected kidney. Ultrasounds demonstrate the obstruction well but they are less sensitive than CTs at picking up renal gas. The gold standard for investigation is a CT of the abdomen as it will show the presence of gas along with renal parenchymal destruction.\(^2\) A previously visualised kidney may progressively disappear on the sonographic image as the ultrasonic waves cannot penetrate the gas envelope around the kidney in patients with advanced emphysematous pyelonephritis. The gas acts as a shield. This is vanishing kidney sign, also called “the sign of the Deaf Kidney”\(^3\).

Learning points

▸ Emphysematous pyelonephritis is a life-threatening condition, which needs early diagnosis and intervention.
▸ Plain X-ray of the abdomen often show mottled gas shadows over the affected kidney and may sometimes help in the busy emergency to diagnose emphysematous pyelonephritis as a cause of acute pain abdomen.
▸ A previously visualised kidney may progressively disappear on the sonographic images due to the infiltration of the perirenal environment by gas envelope in patients with advanced emphysematous pyelonephritis. This is vanishing kidney, also called “the sign of the Deaf Kidney”.

Contributors All the authors had contributed in manuscript the preparation and patient care.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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