DUPLEX COLLECTING SYSTEM WITH ECTOPIC URETEROCOELE A CASE REPORT OF INTRAUTERINE DIAGNOSIS BY ULTRASOUND

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ABSTRACT

A demonstrating case of intrauterine diagnosis of duplex collecting system and ectopic ureterocoele is reported. Early surgical intervention by removal of the dysplastic kidney, its dilated ureter and ectopic ureterocoele can prevent obstruction of the contralateral ureteric orifice and the ipsilateral lower ureter by the ectopic ureterocoele. Comparison and follow up of ultrasound before and after delivery, intravenous pyelogram at 3-month-old, operative and pathological findings are also shown.

INTRODUCTION

Findings of a tortuous tubular fluid-filled structure extended from cystic mass in the upper pole of kidney to the bladder with another thin wall cystic mass in the bladder are suggestive findings of duplex collecting system and ectopic ureterocoele. Absence of gas in the fetal bowel and the limitation of fetal movement in the uterine cavity make sonographic tracing of the entire ureteric course from kidney to bladder performed during intrauterine life easier than performed after delivery. Early surgical intervention by removal of the dysplastic kidney, its dilated ureter and ectopic ureterocoele can prevent obstruction of the contralateral ureteric orifice and the ipsilateral ureter from ectopic ureterocoele.

CASE REPORT

A 31-year-old, G2P1 pregnant woman with a history of uterine atony in the previous pregnancy was first seen in a private clinic for antenatal care. There was a discrepancy of gestational age (GA) estimated from last menstrual period (LMP) and from fundal height. Sonography was performed and revealed a single female breech presentation fetus. Average estimated gestational age from many parameters was 30 weeks 4 day ± 23 days. The amount of amniotic fluid was normal. There was a large cystic mass about 3 × 4 cm in the upper pole of the right kidney. Dilated tortuous fluid filled structure extended from the cyst to the bladder was noted. Minimal separation of the right lower pole and the left renal central echo were also observed. Ureters from these 2 parts were not dilated. Another thin wall cystic mass about 2 × 2 cm in the bladder was seen (FIG 1,2.3,) Duplex collecting system of right kidney with ectopic ureterocoele and mild left hydronephrosis were diagnosed for the foetus.

Elective caesarean section was performed at 39 weeks. Single female baby with good apgar score was delivered. Birth weight was 2.800 gm. Sonography performed 2 days after delivery showed no change in size of the ectopic ureterocoele and the upper system of right kidney. Mild degree of hydronephrosis in the left kidney and the lower system of right kidney remained unchanged. Right lower system ureter and left ureter could not be seen in the entire of their course as the fetal bowel gas made them obscured (Fig 4)

Surgeon suggested that operative treatment for the baby should be done after 1 month. 3 months later the baby was presented with urinary tract infection. Intravenous pyelogram was done after medical treatment of urinary tract infection, and showed nonvisualization of the upper pole

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G2P1 = Gravid 2, Para 1.

of the right duplex collecting system. The lower collecting system of the right kidney was mild hydronephrotic and was displaced downward and laterally. Delayed excretion of left kidney with marked dilatation of the left renal pyelocalyceal system and the entire left ureter were evidenced. Large well defined filling defect in the right side of the bladder caused by ectopic ureterocoele was seen. (Fig 5, 6)

Ultrasound performed 1 day after intravenous pyelogram showed markedly increase in severity of the left hydronephrosis with no change of the ectopic ureterocoele and both collecting systems of the right kidney as compare to the findings performed at birth. (Fig 7, 8)

Cystoscope revealed right accessory orifice with normal bladder mucosa. Right upper pole nephrectomy and dissection of its ureter were done at 4-month-old. Pathological specimens showed a large hydronephrotic kidney about 3 × 3 × 3 cm with chronic pyelitis changes and a hydronephrotic ureter about 12 × 0.6 cm with chronic ureteritis changes. The baby was in a satisfactory condition as seen in the next 3 months follow up.

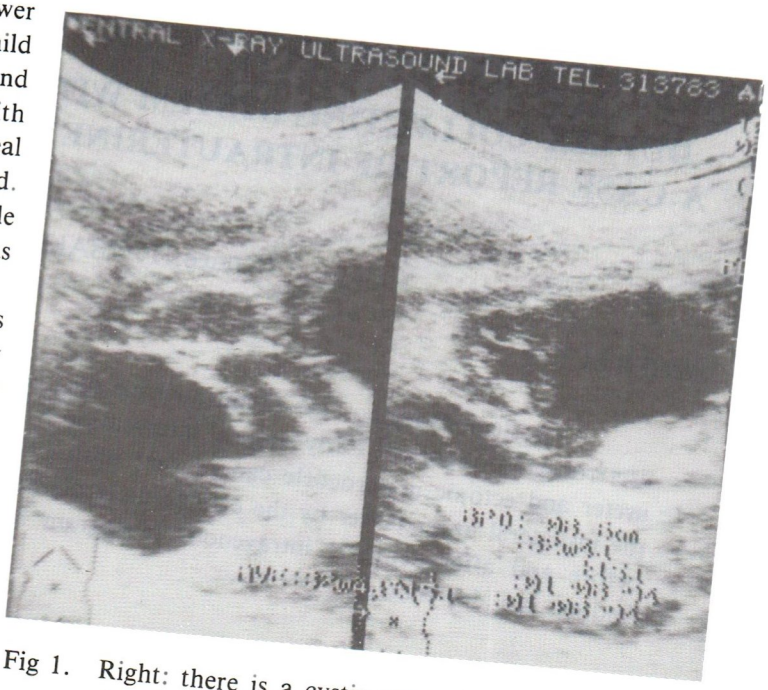

Fig 1. Right: there is a cystic mass about 3 × 4 cm. in the upper pole of right kidney. Left: Dilated tortuous ureter extends from this cystic mass to the bladder.

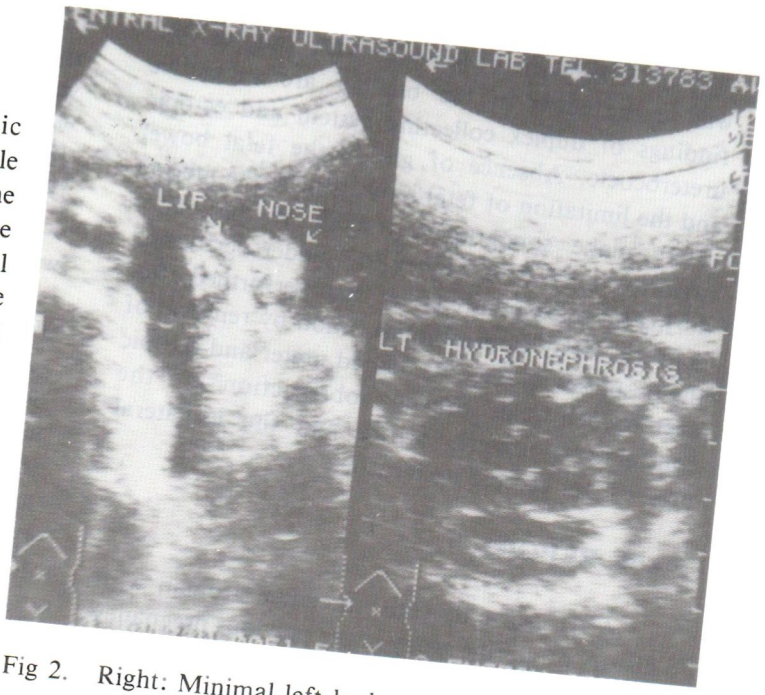

Fig 2. Right: Minimal left hydronephrosis.

DISCUSSION

Duplex collecting system and ectopic ureterocoele defines as conditions with double renal pyelocalyceal systems and duplication of the ureters which are separated throughout their course on ipsilateral side. The ureter from the caudal renal pelvis enters the vesicular trigone in the normal position but the orifice of the ureter derived from the cephalic pelvis enters caudal to it. The ectopic ureteral orifice may open into the urinary or genital tract. When the opening located anywhere along the trigone to the vesical neck, it is unlikely to cause symptoms, but if the openings located distally to the visical neck, they can cause clinical symptoms from obstruction, reflux and incontinence. When obstruction occurs, the dilated ureter which passes into the wall of the bladder from the region of the normal uretero-vesicular orifice to the bladder neck produces a large herniation within the bladder which has been called ectopic ureterocoele. The size may vary from a small bulge of 1-2 centimetres in diameter to a lesion that may almost fill the bladder. The outer surface is vesical epithelium and the inner is ureteral epithelium, between them is a thin layer of muscle and collagen. Large ectopic ureterocoele may obstruct ipsilateral lower pole ureteric orifice and sometimes is large and tense enough to obstruct the ureteric orifice of the contralateral side as well. In addition, reflux into the lower pole ureter of a duplex system is not uncommon. In girls, the usual sites for an ectopic orifice are the bladder neck, urethra, vagina,uterus and cervix. In males ectopic ureters usually drain into prostatic urethra, prostatic utricle, seminal vesicle, vas deferens or ejaculatory duct.[2] Sonography

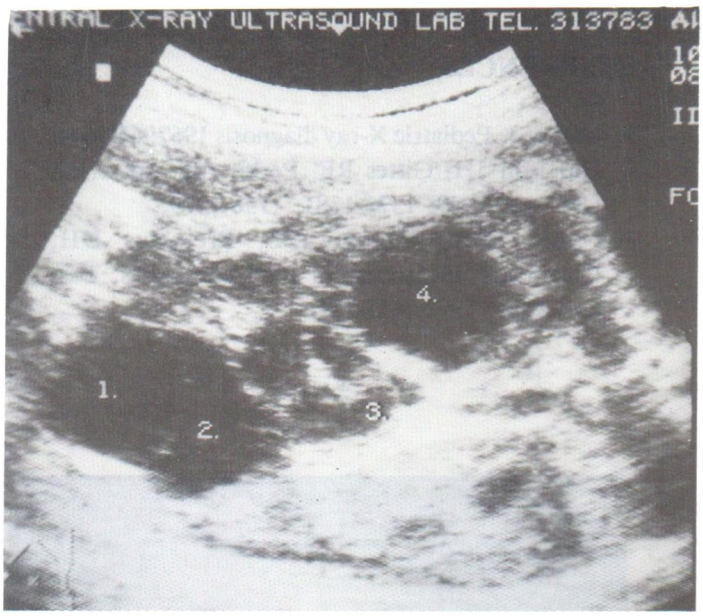

Fig 3. Ectopic ureterocoele about 2 × 2 cm. located at the bladder outline rather than in the center of the bladder. 1 = ectopic ureterocoele 2 = bladder 3 = tortuous dilated right upper system ureter 4 = hydronephrosis of the upper system of right kidney.

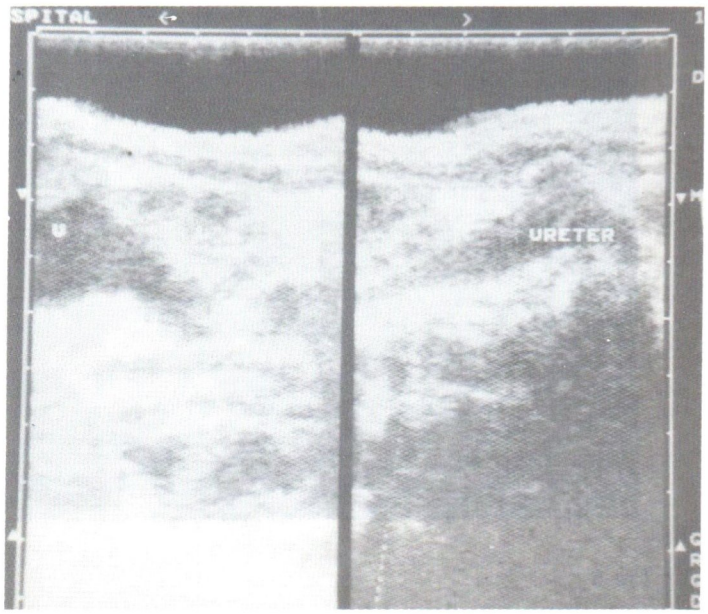

Fig 4. Ultrasound 1 day after delivery showed hydronephrosis of right upper system and tortuous dilated ureter, inability to demonstrate the entire ureter due to obscuring by th fetal bowel gas. U = upper system of right kidney L = lower system of right kidney.

performed during intrauterine is easier than performing after delivery as there is no interference from fetal bowel gas and limitation of fetal movement in uterine cavity. A tortuous fluid filled structure which touchs the fetal spine, originating from the renal pelvis and extending into retrovesicular position distinguished a dilated ureter from fluid filled bowel.[3] A dilated upper pole with a normal lower pole intrarenal collecting system indicates an obstructed duplex collecting system. A thin walled cystic mass in the bladder suggests ectopic ureterocoele. The usual radiographic findings is a nonvisualizing or poorly visualizing upper pole of a duplex system that may be massively hydronephrotic. The upper system displaces the lower pole downward and outward. The calyces of the lower system are fewer in number than in the normal kidney. In addition the lower pelvis and the upper portion of its ureter may be displaced further from the spine than the normal side. Nonopaque filling defect of varying size in bladder from ectopic ureterocoele is usually off center and always appears on the bladder outline rather than as a complete circle within the bladder shadow.[2] No specific prenatal intervention is necessary especially when there is normal amount of amniotic fluid which indicates normal renal function.[3] The portion of kidney drained by the ectopic ureter is almost dysplastic, and management usually requires surgery after delivery. The usual treatment for an ectopic ureter associated with a poorly visualizing or nonvisualizing upper pole of a renal duplication is partial nephrectomy and ureterectomy.[2]

Ectopic ureterocoele may occurs in a single collecting system, usually in males 80% is associated with duplicated collecting system. Ectopic ureter appears commonly in females, varying from 2-12 times more than in males. Approximately 10% of ectopic ureterocoele is bilateral. Ectopic ureterocoele is one of the more serious anomalies of the urinary tract in infancy and childhood. Serious urinary tract symptoms usually occur in the first year of life. The patient often presents during the first few month of life with symptoms of urinary tract infection or failure to thrive. Because of no fetal bowel gas and limitation of fetal movement in utero, sonographic evaluation of kidney and the entire ureter can be done easier than performed after delivery. Early diagnosis and early surgical intervention can prevent damaged of contralateral system and ipsilateral lower ureter from large ectopic ureterocoele compression and from infection.

ACKNOWLEDGEMENTS

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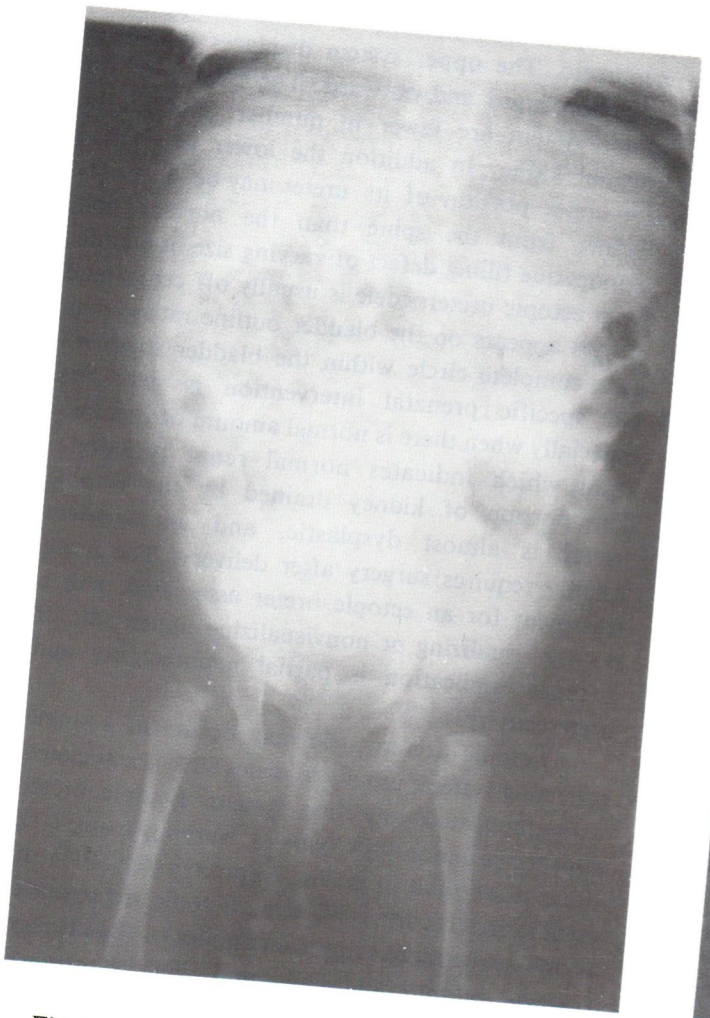

Fig 5.

IVP at 3-month-old. Minimal dilatation of the lower system of right kidney which was displaced downward and laterally. Delayed function of left kidney with filling defect in the bladder from ectopic ureterocoele.

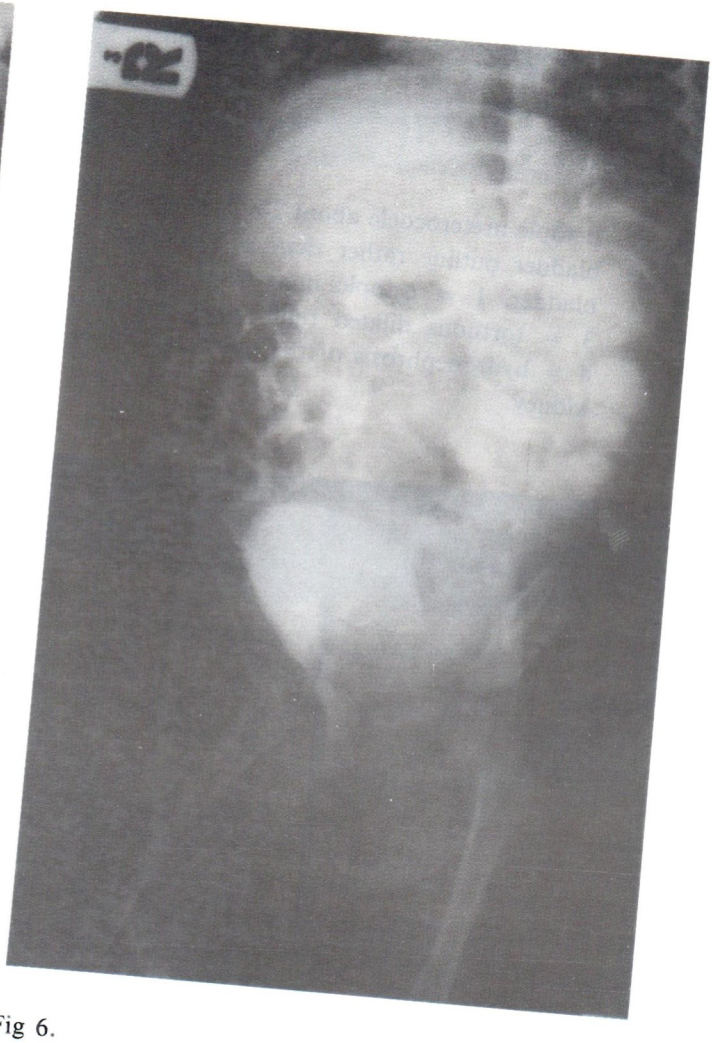

Fig 6.

Progression of left hydronephrosis.

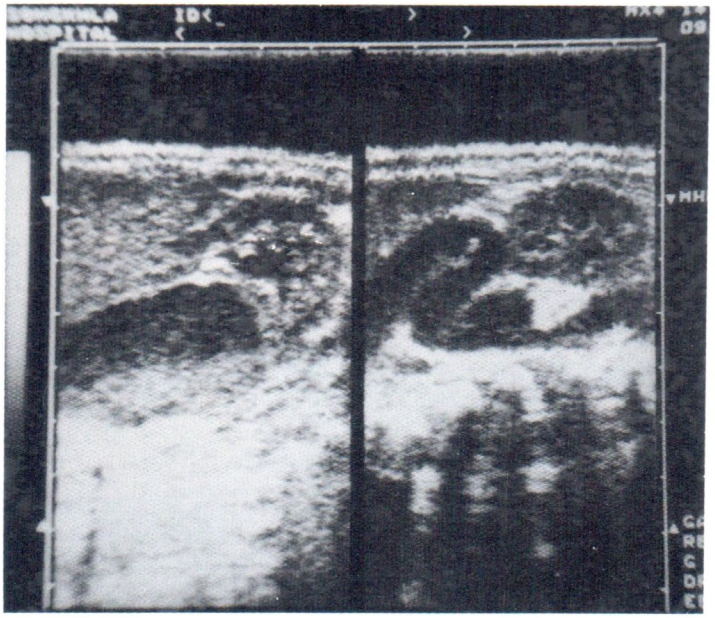

Fig 7. Ultrasound at 3-month-old showed no change of right duplex kidney.

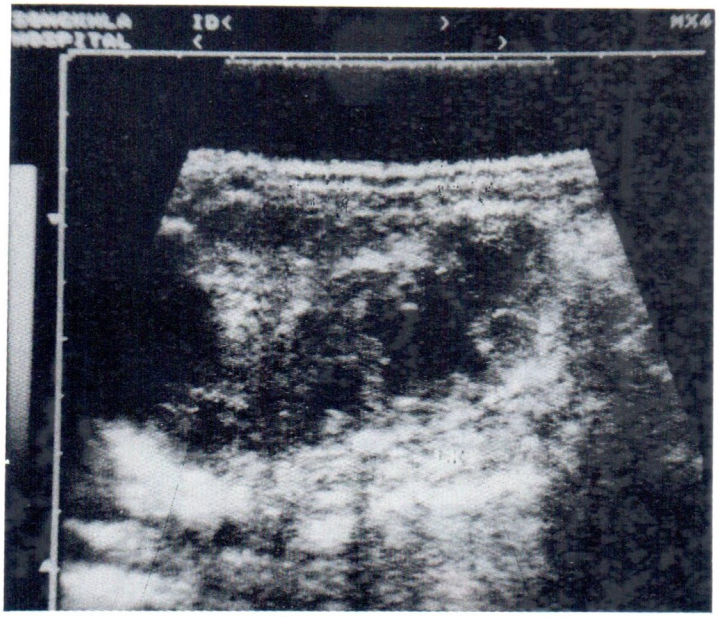

Fig 8. Ultrasound at 3-month-old showed increase in severity of left hydronephrosis as compare to the finding at birth.