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SHORT COMMENTARY

Foetal Ureteric Calculus Producing Hydronephrosis and Hydroureter

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Abstract
Dilatation of foetal urinary collecting system is common. But cause of obstruction, if any, arise from soft tissues or developmental abnormalities of urinary tract or other paradox. A prenatal diagnosis of a 'calculus' inside ureter producing obstruction and ultimate back pressure changes in collecting system of a foetus is not reported so far. Other than inborn error of metabolism, what aetiological factors lead to this, are a matter of concern and great research. Here kidneys are not dysplastic. Amniotic fluid volume remains normal. Antenatal administration of calcium either orally or parenterally could be a contributory factor as it promotes nephrocalcinosis; and uretric calculus has it's origin in kidneys as believed. There is no maternal symptom related to this entity. Here we report a unique case of foetal ureterolithiasis producing hydroureter and hydronephrosis.

Keywords Foetus · Kidney · Hydronephrosis · Ureterolithiasis · Nephrocalcinosis · Prenatal

Introduction

Pregnancy scan is a Pandora's box too much information which may be, normal or abnormal. It is the man behind the machine with a reasonably good equipment and sound knowledge diving into the depth of the fetal world. We look into head, spine, thorax including heart, abdomen and limbs at the onset. The list of abnormalities increases as days pass on.

In urinary tract, renal agenesis, hydronephrosis with or without hydroureter, cystic dysplastic kidneys, etc., comprise main headings [1].

Here is a case report in an asymptomatic primigravida carrying 39 weeks mature foetus having right lower ureteric calculus near ureterovesical junction, a very rare condition that has not found any place in the literature so far.

Case Report

Mrs. R. P., aged 23 years, primigravida, carrying 39 weeks and 2 days of gestation [LMP-16 December 2018], came for routine foetal bio-physical profile ultrasound on 16 September 2019. Foetal maturity was 39 weeks. A linear craniocaudal tubal structure was visible to right of urinary bladder. It was traced up to right kidney cranially, which depicted hydronephrosis [antero-posterior dimension of pelvis in cross section was 2.8 mm] and ureter dilated to 4 to 6 mm. Left kidney and ureter were normal. Any intrarenal echogenicity was not observed (Fig. 1).

Urinary bladder had normal distension and dimensions. Tracing the ureter downwards, a calculus sized 7.3 mm was found at ureterovesical junction inside lumen of dilated right ureter. No other structural abnormality could be detected, and liquor volume was normal having AFI 11.2 cms (Fig. 1).

Systemic parameters were within normal limits including normal TORCH parameters and routine Doppler indices of umbilical artery, MCA and descending thoracic aorta. Any sign of particulate matter floating inside liquor was not found. Dribbling of amniotic fluid or chorioamnionitis was absent.

A male baby was delivered by LSCS on 18 September 2019. Child cried immediately after birth and was passing urine per urethra in a normal manner. Baby was feeding well.

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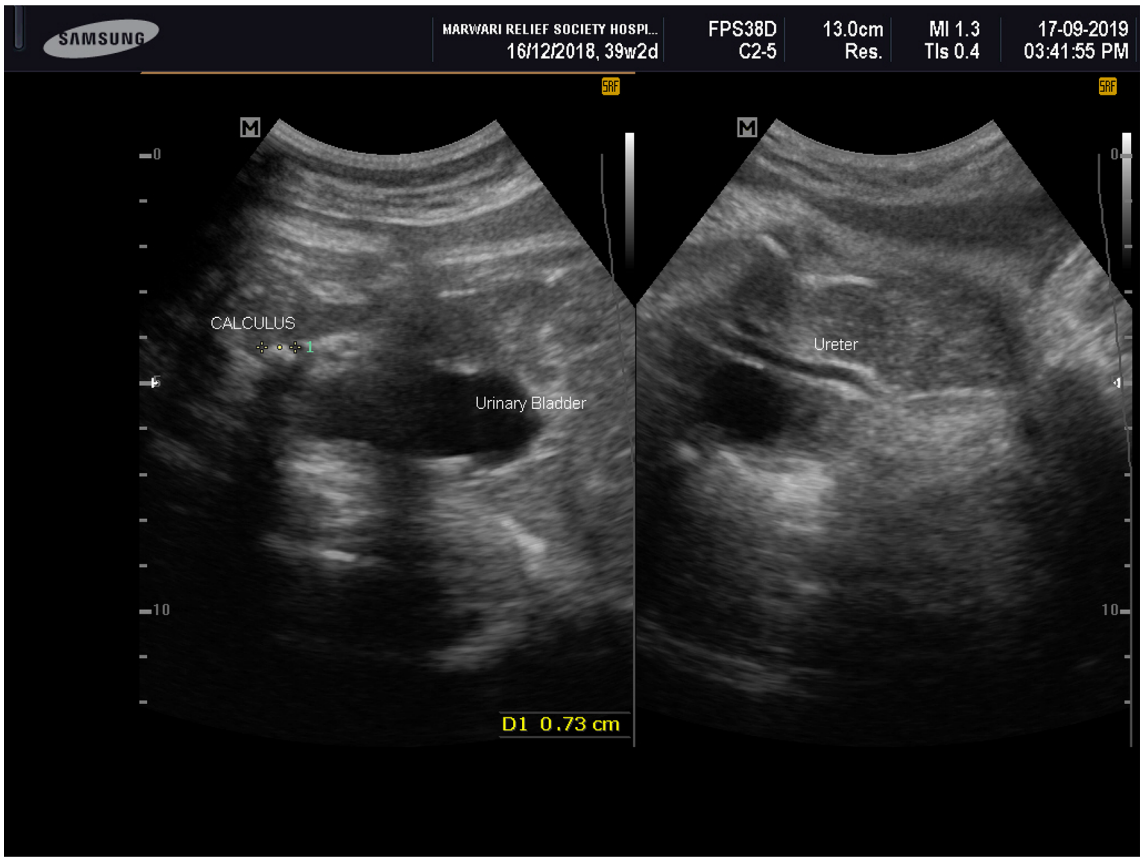

Fig. 1 Prenatal scan [Scan at 39 weeks maturity having right hydronephrosis, hydroureter and 7.3 mm sized calculus in right lower ureter]

After 24 hours of birth, neonatal transabdominal scan on 19 September 2019 exhibited right-sided hydronephrosis and hydroureter having 7.3 mm calculus in lower right ureter; findings were same as prenatal one. But some free fluid appearing around ureter at calculus site this time raised concern (Fig. 2).

Follow-up: Baby was referred to government hospital for further management. Fever and other signs of septicemia started prevailing in gradually. Ureteroscopy could not be done as it was not available. Ultimately, open surgery was undertaken on 18 November 2019 where the ureteric calculus was removed. Baby recovered well and was discharged in fair condition on 25 November 2019.

Discussion

[A] Dilatation of the foetal renal collecting system is very common. This can be due to obstruction in the urinary tract or vesicoureteral reflux [2].

(a) Obstruction in the urinary tract can be near pelvi-ureteric junction or at the vesicoureteric junction or at the bladder outlet.

{i} In pelvi-ureteric junction obstruction, a dilated renal pelvis with or without dilated calyces is seen. No ureteric dilatation is seen, and the amniotic fluid volume is usually normal. It affects males more than twice as often as females [3].

{ii} In vesicoureteric junction obstruction, hydronephrosis and hydroureter are seen. In severe cases, a markedly dilated and tortuous ureter may be seen.

(b) Cystic dysplastic kidney diseases present varying spectrum having associated cysts as well.

[B] Renal pyelectasis [measured in antero-posterior dimension more than 4 mm] is seen in 20-25% of Down foetuses and even less frequently in Edward syndrome or Trisomy 18 as a soft marker in mid-trimester [4]. In this case, biochemical screening and double marker were negative; renal caliectatic dilatation was 2.8 mm only. Associated right-sided hydroureter having 7.3 mm sized calculus with

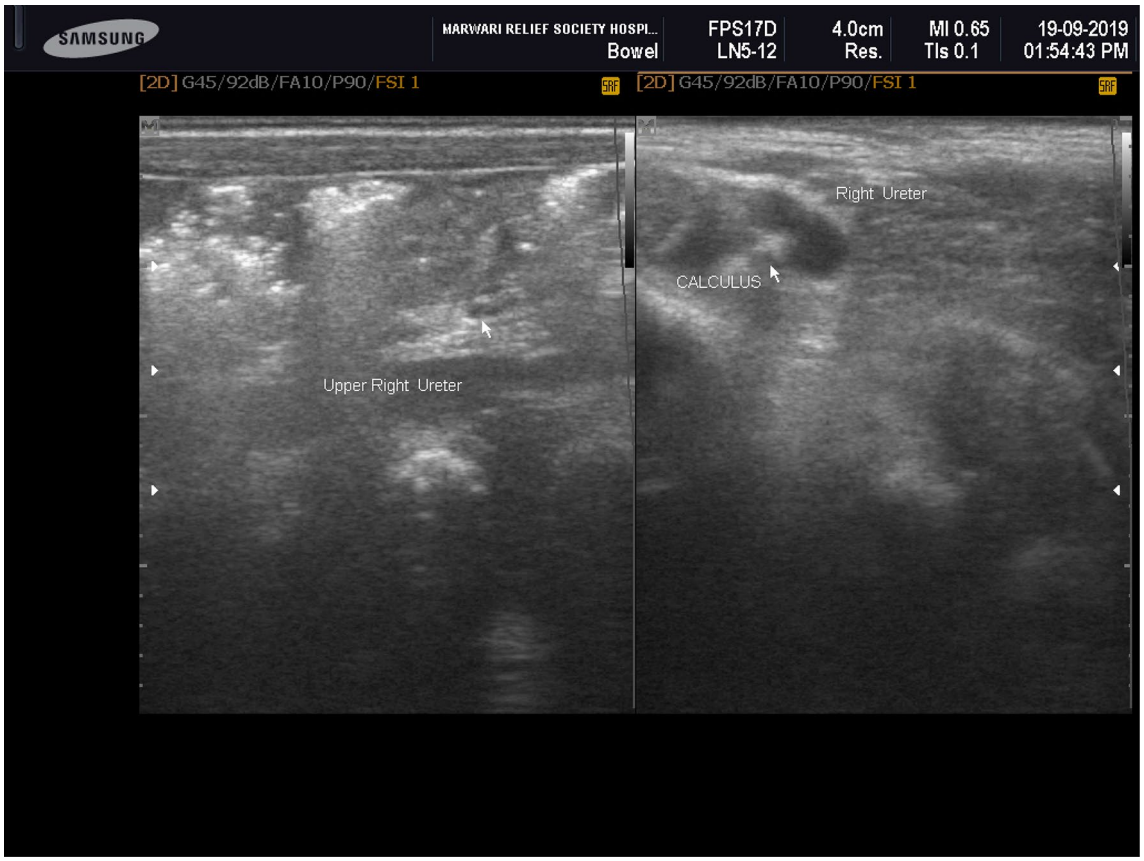

Fig. 2 Post natal scan [Scan in 1-day-old male neonate showing right ureteric calculus and dilated right ureter]

acoustic shadowing near ureterovesicl junction ruled out any significance related to aneuploidy soft marker.

There is only one reported case in a 27-year-old lady carrying 23 weeks of monochorionic diamniotic twin gestation with slight increase in amniotic fluid. But at 28 weeks, oligohydramnios precipitated. They found one 3 mm echogenicity in upper part of right kidney of twin A, and they labelled this as 'foetal nephrocalcinosis'. Babies were born at 33 weeks by LSCS. Neonatal scan on fourth day confirmed the presence of single 4-5 mm upper part renal calculus in twin A (as reported in year 2000). No other such report of urinary calculus could be found in the literature even after extensive search [5].

Conclusion

We report a case of ureterolithiasis in a foetus at 39 weeks and 2 days of gestation having hydronephrosis and hydroureter. Any echogenicity was not present in both kidneys or otherwise. Ureteric stones should have their origin in renal parenchyma as commonly believed and documented. Dilatation of foetal renal collecting system is a very common finding, causes being pelvi-ureteric junction obstruction or vesicoureteral reflux, etc. Bladder outlet obstruction is seen in male foetuses due to posterior urethral valve. It may also occur with urethral atresia or caudal regression syndrome, both of which occur in males and females. Unilateral ureteral obstruction due to ureteric calculus is unknown.

It appears to be first ever reported case of foetal ureterolithiasis. We could not find any other reported evidence of foetal ureterolithiasis in the literature after lot of search.

Limitation

Proper adequate references were not available as the pathology is not reported earlier.

Compliance with Ethical Standards

Conflict of interest None.

Ethical approval This paper has not been published before; it is not under consideration for publication anywhere else; its publication has been approved by co-author, as well as by the responsible authorities.

References

1. Patten RM, Mack LA, Wang KY, et al. The foetal genitourinary tract. Radiol Clin North Am. 1990;28:115–30.
2. Cohen HL, Haller JO. Diagnostic sonography of the foetal genitourinary tract. Urol Radiol. 1987;9:88–98.
3. Walzer A, Koenigsberg M. Prenatal evaluation of partial obstruction of urinary tract. Radiology. 1980;135:93–4.
4. Nyberg DA, Souter VL. Use of genetic sonography for adjusting the risk of foetal Down syndrome. Semin Perinatol. 2003;27:130–44.
5. Tannous RJ, Solhaug MJ, Bogdan D, et al. Prenatal diagnosis of nephrolithiasis. Ultrasound obstetGynecol. 2000;15:331–2.

About the Author

Ashok Kumar Todani graduated from R. G. Kar Medical College, Kolkata, in 1980. He finished his PG in G&O in 1983. He is always interested in newer developing operative modalities, ultrasound (since 1988) and endoscopic surgery (since 1984). He obtained Diploma in Surgical Pelviscopy from the University of Kiel, Germany, in 1992. He also served in Indian College of Medical Ultrasound as Vice Dean from 2008 to 2012. He won Dr. C. S. Dawn Prize at 34th AICOG at Nagpur, delivered more than 100 lectures in various conferences and seminars and has 13 publications so far. His areas of special interest are NDVH, operative endoscopy, infertility, anomaly scan, etc. Staying in a small place of Raniganj in west Bengal, he loves to serve humanity with latest technologies supported by his better half Dr. Kiranlata Todani and son Dr. Rishi Todani. Academics is his passion of life.