Case Report on Neonatal Renal Pelviectasis

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ABSTRACT

Renal pelviectasis is characterized by dilatation of the renal pelvis and is commonly identified during antenatal screening or in the neonatal period. Although most cases are benign and resolve spontaneously, renal pelviectasis may sometimes indicate underlying urinary tract abnormalities such as ureteropelvic junction obstruction or vesicoureteral reflux. Early diagnosis, appropriate investigation, and continuous follow-up are essential to prevent long-term renal complications. This case report describes the clinical presentation, diagnostic evaluation, and conservative management of a neonate diagnosed with renal pelviectasis.

Keywords: Neonate, Renal pelviectasis, Ureteropelvic junction obstruction, Vesicoureteral reflux.

INTRODUCTION

Renal pelviectasis refers to dilatation of the renal pelvis and is a common finding on antenatal ultrasonography. It may represent a transient physiological condition or signify underlying urinary tract pathology such as ureteropelvic junction obstruction or vesicoureteral reflux. When detected antenatally, careful postnatal evaluation is required to assess renal function, identify obstruction or reflux, and determine the need for medical or surgical intervention. This case report highlights the postnatal evaluation and conservative management of a neonate with isolated unilateral renal pelviectasis.[2–4]

Incidence

Renal pelviectasis and antenatal hydronephrosis are among the most frequently identified congenital renal anomalies. A prospective study conducted at the Institute of Child Health and Hospital for Children, Madras Medical College, Chennai, reported that ureteropelvic junction obstruction accounted for approximately 69% of antenatally detected hydronephrosis cases.[5]

At the national level, a study published in *Indian Pediatrics* reported an incidence of 0.4% for antenatally detected renal malformations among live-born infants in rural Maharashtra.[6] Another tertiary-care study observed that nearly 78% of neonates with antenatally detected renal anomalies had confirmed congenital renal malformations postnatally, with a male predominance.[6,7]

PATHOPHYSIOLOGY

Renal pelviectasis occurs due to impaired drainage of urine from the renal pelvis. This impairment may be physiological, resulting from immature ureteral peristalsis, or pathological due to obstruction or vesicoureteral reflux. Disruption of urine outflow increases intrapelvic pressure, leading to dilatation of the renal pelvis. Persistent pressure can compress renal parenchyma, reduce glomerular filtration, and increase the risk of hydronephrosis and long-term renal damage if left untreated.[3,4]

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Case Presentation

The baby of Mrs. Ramya was a term neonate born at 38 weeks of gestation through normal vaginal delivery at Trichy SRM Medical College Hospital and Research Centre. The neonate cried immediately after birth, with Apgar scores of 8/10 at one minute and 9/10 at five minutes. The birth weight was 2.79 kg. Shortly after birth, the neonate developed oliguria and abdominal distension.

Investigations, including renal ultrasonography, serum creatinine estimation, and voiding cystourethrogram (VCUG), were performed. Imaging revealed dilatation of the renal pelvis, consistent with neonatal renal pelviectasis. Conservative management was initiated with close monitoring of urine output and renal function. The neonate remained clinically stable and was placed on regular follow-up with serial ultrasonographic evaluations.[2],[4]

BIRTH HISTORY

Antenatal:

The mother was registered for antenatal care and attended regular check-ups. Iron and folic acid supplementation was taken, and antenatal immunization was completed. There was no history of anemia, eclampsia, oligohydramnios, or polyhydramnios.

Intranatal

The delivery was normal and uneventful. The neonate cried immediately after birth. Mild abdominal distension was noted.

Postnatal

Breastfeeding was initiated within 24 hours of life. Meconium was passed within 24 hours; however, dribbling of urine and reduced urine output were observed.

Family History

There is no evidence of communicable, hereditary &congenital disease in the family.

Past History

There is no past history of illness.

Now the baby is hospitalized for treatment. The paediatrician prescribed medications such as Inj.cephalexin15 mg/kg/day. Cardinal signs were monitored regularly. Urine output was measured. Plan for Close monitoring with **repeat imaging.**

Physical Examination

- Abdominal distension with an abdominal girth of 36 cm
- Palpable abdominal mass without tenderness
- Presence of fluid thrill
- No other significant systemic abnormalities

Investigation

- Serum creatinine: 1.8 mg/dL

- VCUG(voiding cytourethrogram): Low-grade reflux with dilatation of the renal pelvis (Grade III)
- Renal pelvis anteroposterior diameter: 5 mm[3]

Etiology

BOOK PICTURE	CHILD PICTURE
• Physiological (Transient) Pelviectasis • Obstructive Uropathy • Vesicoureteral Reflux (VUR) • Genetic and Syndromic Causes • Neurogenic or Functional Bladder Disorders	• Physiological (Transient) Pelviectasis

Clinical Features

BOOK PICTURE	CHILD PICTURE
Asymptomatic; discovered incidentally on imaging **Fever**, **poor feeding**, **vomiting**, **irritability** (signs of UTI) Signs of obstruction- **Abdominal mass**, **poor urine output**, **hypertension** (in severe cases) Symptoms in PUV- **Poor urine stream**, **bladder distention**, **oliguria** Family history- VUR, renal malformations, genetic syndromes Associated syndromes- Renal-Coloboma Syndrome**,** BOR Syndrome**,** Trisomy 21	□ The abdominal girth is increased to 36 cm. □ A mass is palpable on abdominal examination. □ There is no tenderness on palpation. □ A fluid thrill is present in the abdomen. □ Urine output is reduced. □ The feeding pattern is poor.

Diagnostic Evaluation

BOOK PICTURE	CHILD PICTURE
□ Serum creatinine and BUN (renal function) □ Electrolytes (in severe obstruction or bilateral disease) **Urinalysis and Urine Culture** • Rule out **UTI**, especially if febrile or signs of infection • Helps guide need for **prophylactic antibiotics** • Genetic Testing Prenatal Detection	• Creatinine level:1.8 mg/dl **VCUG REPORT:** • Low grade: Dilating reflex into renal pelvis (III) • Renal pelvis AP diameter is 5 mm (Normal range is 4 mm if < 28 weeks)

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Fetal Ultrasound (typically at 18–22 weeks): **Follow-up fetal ultrasounds** assess: • Progression of dilation • Amniotic fluid volume (low suggests obstruction) • Associated anomalies (e.g., bladder thickening) **POSTNATAL DIAGNOSIS** • Renal Nuclear Scan (MAG3 or DTPA) • Voiding Cystourethrogram (VCUG) • Renal and Bladder Ultrasound (RBUS)	

Management

BOOK PICTURE

Condition	Management
Mild Renal Pelviectasis	Observation, follow-up renal ultrasound (4-6 weeks), prophylactic antibiotics if necessary
Low-Grade VUR	VCUG to assess reflux, prophylactic antibiotics, follow-up renal ultrasound, regular UTIs monitoring
High-Grade VUR	VCUG, prophylactic antibiotics, possible surgical correction (ureteral reimplantation or endoscopic treatment)
Obstructive Uropathy (e.g., UPJ Obstruction, PUV)	Surgical intervention (pyeloplasty, valve ablation), early drainage (vesicostomy), follow-up imaging
Recurrent UTIs	Prophylactic antibiotics, VCUG to assess reflux, renal ultrasound, possible surgical interventions
Chronic Kidney Dysfunction	Monitor renal function (e.g., BUN, creatinine), growth, and blood pressure, nephrology referral

CHILD PICTURE

Mild Renal pelviectasis

Observation

Follow up renal ultrasound (4- 6 weeks)

Prophylactic antibiotic started.

Supportive Management

- Monitoring Growth and Development
- Nutrition
- Parental Education

Long-Term Follow-Up and Surveillance • Renal Ultrasound • Urological and Nephrology Consultations	

Management

The neonate was managed conservatively with observation and close monitoring. Prophylactic antibiotics were initiated to prevent urinary tract infection. Follow-up renal ultrasonography was planned at four- to six-week intervals. Supportive care included nutritional support, growth monitoring, and parental education.[2],[4]

Nursing Management

Nursing care focused on monitoring urine output, observing for signs of urinary tract infection, assessing abdominal distension, maintaining fluid balance, and ensuring skin integrity. Parents were educated regarding hygiene practices, medication compliance, recognition of warning signs, and the importance of follow-up care.[1]

Nursing Diagnosis:

- Impaired Urinary Elimination related to Obstructive uropathy as evidenced by abdominal distension (36 cm).
- Fluid Volume Excess related to Decreased renal excretion secondary to urinary tract obstruction as evidenced by increased abdominal girth and poor urine output
- Impaired skin integrity related to abdominal distension as evidenced by skin breakdown
- Ineffective feeding pattern related to abdominal discomfort associated with renal condition as evidenced by Disrupted or reduced feeding sessions
- Parental Knowledge deficit related to Lack of information about the neonate's renal condition, treatment plan, and home care as evidenced by frequently asking questions about diagnosis, medication, or follow-up care.
- Risk for Infection related to Stasis of urine as evidenced by anatomical urinary tract abnormalities

Nursing diagnosis	Nursing intervention	Rationale
1. Impaired Urinary Elimination related to Obstructive uropathy as evidenced by abdominal distension (36 cm).	➢ Monitored urine output.	➢ Accurate measurement helps detect early signs of worsening obstruction or renal failure. Decreased urine output indicates impaired elimination.
	➢ Measured abdominal girth every 4–6 hours or as ordered.(36 cm)	➢ Helps evaluate changes in abdominal swelling due to urinary retention or ascites. Trends can guide the need for intervention.
	➢ Palpated the abdomen gently to assessed for masses or bladder fullness and monitored for tension or changes.	➢ Detects enlargement of the bladder or kidneys suggesting worsening obstruction.

	➢ Maintained accurate intake and output records (I&O chart).	➢ Ensures fluid balance is maintained and helps monitor renal function.
	➢ Prepared for and Support Diagnostic Tests:(Assist with or prepare for renal ultrasound, VCUG, or renal scan to determine the cause of obstruction)	➢ Imaging is essential to identify the cause, severity, and location of the obstruction to guide further treatment.
	➢ Educate and support parents about the condition, procedures, and importance of follow-up.	➢ Reduces anxiety, promotes understanding, and ensures compliance with treatment and observation.
Nursing diagnosis	**Nursing intervention**	**Rationale**
2. Fluid Volume Excess related to Decreased renal excretion secondary to urinary tract obstruction as evidenced by increased abdominal girth and poor urine output.	➢ Measured and record abdominal girth (36 cm)	➢ Tracks changes in abdominal distension, helping evaluate fluid accumulation (ascites, hydronephrosis).
	➢ Monitored and documented urine output hourly.	➢ Early identification of worsening oliguria (low output) or anuria can prevent progression to fluid overload.
	➢ Assessed for other signs of fluid overload: edema, bulging fontanelles, tachypnea, crackles, or weight gain.	➢ Helps detect systemic effects of excess fluid, including potential respiratory or cardiovascular compromise.
	➢ Monitored daily weight	➢ A reliable indicator of fluid retention or loss. A sudden weight increase often reflects fluid accumulation.
	➢ Restricted fluids as ordered by the provider, based on kidney function and output.	➢ Helps prevent worsening of fluid overload when the kidneys cannot excrete properly.
	➢ Educate parents about fluid monitoring, signs of worsening condition (e.g., swelling, breathing difficulty), and the importance of follow-up.	➢ Promotes early detection of complications and improves treatment compliance.
Nursing diagnosis	**Nursing intervention**	**Rationale**
3.Impaired skin integrity related to abdominal distension as evidenced by skin breakdown	➢ Assessed the neonate's abdominal skin at least every shift for redness, breakdown, or pressure injuries.	➢ Neonatal skin is thin and fragile. Regular assessment helps identify early signs of compromise for timely intervention.
	➢ Gently cleanse the abdominal area using warm water and soft cloths; avoid harsh soaps or vigorous rubbing.	➢ Neonatal skin is sensitive. Gentle cleansing prevents irritation and further breakdown.

	➢ Apply a protective barrier cream (e.g., zinc oxide or petroleum-based) to areas at risk of moisture or friction damage.	➢ Barrier creams protect against moisture-associated skin damage, which is common in skin folds over distended abdomens.
	➢ Use soft, breathable, and non-restrictive clothing or diapers that do not rub against the distended abdomen.	➢ Proper clothing reduces friction and allows air circulation, promoting skin integrity and comfort.
	➢ Minimize pressure on the abdomen by positioning the infant semi-upright or side-lying, as appropriate.	➢ Reducing pressure on the distended area decreases the risk of further skin breakdown and promotes comfort.
	➢ Educate caregivers on proper skin care, diapering techniques, and the importance of reporting skin changes.	➢ Involving parents in care increases compliance and supports early detection of skin issues at home.

DISCUSSION

Neonatal renal pelviectasis is commonly detected during antenatal screening or early neonatal evaluation. While many cases resolve spontaneously, persistent or progressive dilatation may indicate underlying obstructive or reflux pathology such as UPJ obstruction or VUR. These conditions require close monitoring and, in selected cases, surgical intervention to prevent long-term renal impairment.[3–5]

CONCLUSION

This case report emphasizes the importance of early postnatal evaluation and regular follow-up in neonates with renal pelviectasis. Prompt diagnosis and appropriate management are essential to prevent progression to hydronephrosis and chronic renal damage.

Declarations

- **Conflicts of Interest:** None declared.
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