International Journal of Medical and Pharmaceutical Research

Online ISSN-2958-3683 | Print ISSN-2958-3675
Frequency: Bi-Monthly
Website: https://ijmpr.in/

Case Report

Transient Neonatal Cholelithiasis in a Preterm Twin with Feeding Intolerance and Hyperbilirubinemia: A Case Report

Dr Khurshed Alam Choudhury[1], Dr Shrinidhi R. Kulkarni[2], Dr Kanak Lata Yadav[3]

[1]Department of Pediatrics, United Institute of Medical Sciences, Prayagraj, Uttar Pradesh, India
[2]Department of Radiodiagnosis, United Institute of Medical Sciences, Prayagraj, Uttar Pradesh, India
[3]Department of Pediatrics, Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow, Uttar Pradesh, India

OPEN ACCESS

Corresponding Author:

Dr Khurshed Alam Choudhury
Department of Pediatrics, United Institute of Medical Sciences, Prayagraj, Uttar Pradesh, India

Received: 28-03-2026
Accepted: 16-04-2026
Published: 30-04-2026

ABSTRACT

Background: Neonatal and infantile cholelithiasis is an uncommon condition, increasingly recognized due to widespread use of ultrasonography. Although most cases are asymptomatic and self-limiting, gallstones in neonates may present with feeding intolerance, cholestasis, or hyperbilirubinemia.
Case Presentation: We report a preterm male twin born at 31 weeks and 2 days of gestation via lower segment cesarean section (LSCS), admitted to the neonatal intensive care unit (NICU) for respiratory distress. On day 3 of life, twin 2 developed feeding intolerance, abdominal distension, and neonatal hyperbilirubinemia. Abdominal ultrasonography revealed cholelithiasis with gallbladder sludge. Hyperbilirubinemia was managed with one day of phototherapy, resulting in normalization of serum bilirubin levels appropriate for gestational age and day of life. Conservative management was adopted, and the infant showed clinical improvement without surgical intervention.
Conclusion: Neonatal cholelithiasis in preterm infants may be associated with prematurity and phototherapy exposure. Most cases resolve spontaneously with conservative management. Awareness of this entity is important to avoid unnecessary invasive interventions.

Keywords: *Neonatal cholelithiasis, prematurity, gallbladder sludge, phototherapy, twin pregnancy, hyperbilirubinemia.*

INTRODUCTION

Cholelithiasis in neonates and infants is rare, accounting for a small proportion of gallstone disease in childhood.[1] Fetal and neonatal gallstones are increasingly diagnosed due to advances in ultrasonography.[2,3]
Predisposing factors in neonates include:[1,3,4]

- Prematurity
- Hemolytic disorders
- Total parenteral nutrition (TPN)
- Sepsis
- Phototherapy
- Prolonged fasting
- Congenital anomalies

Phototherapy has been identified as a potential contributing factor in some cases.[1,4] However, up to 30–40% of infants have no identifiable risk factors.[4]

Most neonatal gallstones are asymptomatic and resolve spontaneously within the first year of life.[2,5]
We present a case of transient cholelithiasis in a preterm twin presenting with feeding intolerance and hyperbilirubinemia.

CASE PRESENTATION

A male preterm twin (Twin 2) was delivered at 31 weeks and 2 days of gestation via LSCS. Birth weight and Apgar scores were appropriate for gestational age (details available in NICU records). He was admitted to the NICU for respiratory distress, managed as per standard preterm protocol.

Day 3 of Life
The infant developed:

- Feeding intolerance
- Abdominal distension
- Neonatal hyperbilirubinemia

There was no documented hemolytic disease, congenital anomaly, or exposure to TPN.

Investigations

- Serum bilirubin: Elevated for gestational age and day of life
- Complete blood count: Within acceptable neonatal range
- Abdominal ultrasonography:
    - Gallbladder sludge
    - Echogenic calculi consistent with cholelithiasis
    - No biliary duct dilatation
    - No features of acute cholecystitis

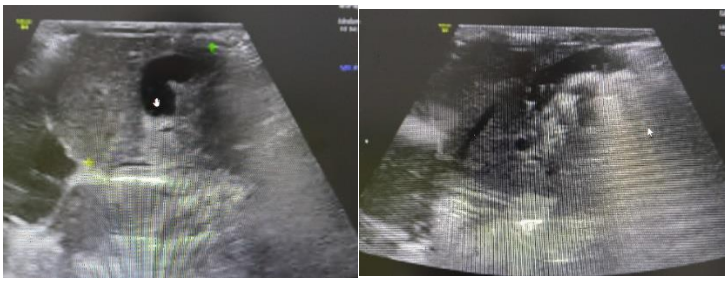

Fig. 1: Ultrasound images of the gallbladder showing few shadowing echogenicities of approximately 2 to 3 mm with sludge.

Ultrasound findings were consistent with descriptions in prior neonatal reports.[3,4]

Management

- Phototherapy for 1 day
- Gradual reintroduction of feeds
- Supportive NICU care

Following phototherapy, bilirubin levels normalized appropriately for gestational age and postnatal age.

The infant improved clinically, feeding intolerance resolved, and abdominal distension subsided. Surgical intervention was not required.

DISCUSSION

Neonatal and infantile cholelithiasis is an uncommon but increasingly recognized clinical entity, largely due to the widespread use of high-resolution ultrasonography in both prenatal and postnatal care. Historically considered rare, recent literature suggests that its detection has risen significantly over the past two decades.[2,3] Although pediatric gallstone disease remains far less common than adult cholelithiasis, infants represent a distinct clinical subgroup with unique etiopathogenic mechanisms and a markedly different natural history.

Epidemiology and Clinical Context

The reported incidence of fetal cholelithiasis ranges from 0.07% to 1.15% in third-trimester ultrasonographic evaluations.[2] Postnatally, cholelithiasis accounts for a small fraction of pediatric gallstone disease, with approximately 15% of pediatric gallstone cases occurring in infants under one year of age.[4] However, true incidence may be underestimated, as many cases remain asymptomatic and are detected incidentally.

In our case, cholelithiasis was identified in a preterm infant on day 3 of life during evaluation for feeding intolerance and hyperbilirubinemia. The early presentation aligns with previous reports describing gallstones in both neonatal and early infancy periods.[1,3]

Pathophysiology

The mechanisms underlying neonatal cholelithiasis differ substantially from those observed in adults. In adults, cholesterol supersaturation, gallbladder hypomotility, and mucin hypersecretion are primary drivers of stone formation. In neonates, however, pigment stones predominate.

More than 70% of pediatric gallstones are pigment stones, particularly calcium bilirubinate stones.[1,4] These result from:

- Increased bilirubin turnover
- Immature hepatic conjugation pathways
- Bile stasis

- Disruption of enterohepatic circulation

Neonates naturally have higher bilirubin production due to increased red blood cell mass and shorter erythrocyte lifespan. In preterm infants, hepatic immaturity further compromises bilirubin conjugation and excretion, increasing biliary bilirubin concentration. Supersaturation of bile with unconjugated bilirubin may precipitate pigment stone formation.

In addition, bile stasis plays a critical role. Reduced enteral feeding, fasting, and immaturity of gallbladder contractility decrease bile flow, promoting sludge formation. This mechanism is well described in association with total parenteral nutrition.[2,6] Although our patient did not receive TPN, prematurity and early feeding intolerance may have transiently impaired gallbladder emptying.

Risk Factors in the Present Case

Multiple risk factors for neonatal cholelithiasis have been described in the literature, including:[1,2,4,7]

- Prematurity
- Hemolytic disorders (e.g., Rh/ABO incompatibility)
- Sepsis
- TPN
- Congenital biliary anomalies
- Maternal diabetes
- Phototherapy
- Twin pregnancy
- Polycythemia

1. Prematurity

Prematurity is consistently cited as a risk factor. Preterm infants have:[1,4]

- Immature bile acid synthesis
- Reduced bile flow
- Altered enterohepatic circulation
- Increased susceptibility to cholestasis

Our patient, born at 31 weeks and 2 days, likely had transient physiological cholestasis contributing to sludge and stone formation.

2. Phototherapy

Phototherapy has been implicated as a potential contributing factor.[1,4] Although the mechanism is not fully established, proposed explanations include:

- Altered bilirubin metabolism
- Increased biliary bilirubin excretion
- Changes in bile composition

While causality remains unproven, several case reports note phototherapy exposure as the only identifiable risk factor. In our case, hyperbilirubinemia requiring phototherapy may have contributed to transient pigment stone formation.

3. Twin Pregnancy

Twin gestations are associated with elevated maternal estrogen and progesterone levels, which may influence fetal bile composition.[2] Although fetal cholelithiasis has been described in monochorionic twins,[2,7]the precise contribution of twin gestation remains unclear.

Clinical Presentation

Neonatal cholelithiasis is often asymptomatic. When symptomatic, presentations may include:[1,3]

- Feeding intolerance
- Vomiting
- Abdominal distension
- Cholestatic jaundice
- Sepsis-like presentation
- Rarely, acute cholecystitis

Our patient presented with feeding intolerance and abdominal distension, but without evidence of biliary obstruction or cholecystitis. The absence of bile duct dilation on ultrasound suggested non-obstructive disease.

It is important to distinguish gallstone-related cholestasis from more serious causes of neonatal conjugated hyperbilirubinemia such as:[3]

- Biliary atresia
- Metabolic disorders
- Neonatal hepatitis

In our case, normal ductal caliber and spontaneous improvement supported a benign etiology.

Imaging Considerations

Ultrasonography remains the gold standard for diagnosis.
Typical findings include:[2,3,4]

- Echogenic intraluminal foci
- Acoustic shadowing (for calculi >3 mm)
- Mobile sludge
- Absence of vascular flow within sludge

Ultrasound sensitivity for gallbladder stones approaches 95%, though lower for common bile duct stones.[4] In neonates, distinguishing sludge from tumefactive sludge or masses requires careful Doppler assessment.

In our case, ultrasonography demonstrated gallbladder sludge and calculi without ductal dilation, consistent with uncomplicated cholelithiasis.

Natural History and Prognosis

A striking difference between neonatal and adult gallstone disease is the high rate of spontaneous resolution in infants.
Hurni et al. (2017)[2], reviewing 133 fetal cases, reported:

- 70% resolution within 2 months
- 90% resolution within 6 months
- Rare persistence beyond 12 months

Similarly, Marathum Palli (2023)[4] reported spontaneous resolution in most infants managed conservatively. Jeanty et al. (2015)[5] concluded that invasive intervention is rarely required in infancy.

Resolution is thought to occur due to:[2]

- Increased bile flow after establishment of feeding
- Maturation of bile acid synthesis
- Improved gallbladder motility
- Changes in bile composition

Our patient demonstrated rapid clinical improvement and normalization of bilirubin following phototherapy, supporting a transient and self-limiting process.

Management Strategy

Management of neonatal cholelithiasis depends on symptomatology.
Conservative Management (Preferred in Asymptomatic Cases)

- Observation
- Serial ultrasonography
- Optimization of feeding
- Treatment of underlying causes

Most authors recommend conservative management in asymptomatic or mildly symptomatic infants.[4,5]
Medical Therapy

Ursodeoxycholic acid has been used in select cases, though evidence does not demonstrate clear superiority over observation.[2]

Surgical Intervention
Indications include:

- Persistent obstruction
- Recurrent cholangitis
- Acute cholecystitis
- Failure of conservative management

Surgery is rarely required in neonates.[5]

Our patient required only supportive care and phototherapy, with no need for pharmacologic bile acid therapy or surgical consultation.

Clinical Implications

This case reinforces several important clinical principles:

1. Neonatal cholelithiasis may occur in preterm infants without major hemolytic disease.
2. Phototherapy exposure may be a contributory but not definitive risk factor.
3. Most cases follow a benign and self-limiting course.
4. Early recognition prevents unnecessary invasive investigations or surgical intervention.
5. Ultrasonographic follow-up is essential until resolution.

Given the increasing use of abdominal ultrasonography in NICUs, clinicians should be aware that incidental gallstones in neonates often represent a transient physiological phenomenon rather than a surgical disease.

Summary of Key Learning Points

- Prematurity and transient cholestasis are important contributors.
- Pigment stones predominate in neonates.
- Ultrasonography is diagnostic and sufficient.
- Conservative management is appropriate in the absence of complications.
- Prognosis is excellent in most cases.

REFERENCES:

1. Mohan, G., Krishnan, C., Daniel, S., Joseph, R. S., Sarin, K., & Pillai, S. K. (2010). Cholelithiasis in a young infant. *Pediatric Oncall, 7*(3), 75–76.
2. Hurni, Y., Vigo, F., von Wattenwyl, B. L., Ochsenbein, N., & Canonica, C. (2017). Fetal cholelithiasis: Antenatal diagnosis and neonatal follow-up in a case of twin pregnancy – A case report and review of the literature. *Ultrasound International Open, 3*, E8–E12. https://doi.org/10.1055/s-0042-123840
3. Brakohiapa, E. K. K., Brown, W., Edzie, E. K. M., Sarkodie, B. D., Dzefi-Tettey, K., Ohene-Botwe, B., & Gorleku, P. N. (2023). Incidental ultrasound finding of cholelithiasis in an 8-week-old infant: A case report. *Radiology Case Reports, 18*(11), 4134–4136. https://doi.org/10.1016/j.radcr.2023.08.083
4. Marathum Palli, N. (2023). An uncommon case in a healthy infant: A case of infantile cholelithiasis. *Dubai Medical Journal, 6*, 229–233. https://doi.org/10.1159/000530676
5. Jeanty, C., Derderian, S. C., Courtier, J., & Hirose, S. (2015). Clinical management of infantile cholelithiasis. *Journal of Pediatric Surgery, 50*(8), 1289–1292. DOI: 10.1016/j.jpedsurg.2014.10.051
6. Thurston, W. A., Kelly, E. N., & Silver, M. M. (1986). Acute acalculous cholecystitis in a premature infant treated with parenteral nutrition. *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne*, *135*(4), 332–334.
7. Kaur, S., Singh, P., & Yusuf, K. (2025). Neonatal cholelithiasis, an unusual association with twin anemia and polycythemia sequence: A case report. *Journal of Neonatal-Perinatal Medicine, 18*(4), 395–398. https://doi.org/10.1177/19345798251337351