



SPONTANEOUS IDIOPATHIC PERFORATION OF GALL BLADDER IN NEONATES

Dr Ajay M. Naik

Professor and HOD Surgery Smt. Kashibai Navale Medical College and General Hospital, Pune

Dr Apoorva P.Makan*

PG resident in General Surgery Smt. Kashibai Navale Medical College, Pune.
*Corresponding Author

ABSTRACT

This is a case series of 3 neonates with features of acute abdomen. The first neonate presented on day 6 of life with convulsions and fever. He developed abdominal distension and had bilious vomiting by day 11 of life. After clinical and radiological diagnosis of intestinal obstruction and failure to resolve with conservative management, laparotomy was done which revealed multiple inter bowel loop adhesions and an omental band adherent to distal ileum. On exploration, a localised abscess was seen around the gall bladder, a 0.5cm diameter perforation in the gall bladder. Exploratory laparotomy with cholecystectomy was done. The other two neonates presented with similar features and exploratory laparotomy with cholecystectomy was done. Perforation of the gall bladder is a rare cause of neonatal intestinal obstruction. The management is surgical and cholecystectomy or sewing the perforation should depend on the size of the perforation and the extent of peritonitis.

KEYWORDS : Gall bladder perforation, Neonate, Intestinal obstruction.

Introduction:

Spontaneous perforation of the gall bladder in a neonate is an extremely rare and poorly documented condition. In any case, perforations of the gall bladder in children are rare⁽¹⁻⁵⁾ Spontaneous perforations of the extrahepatic biliary tree are however documented. Prompt surgical intervention remains the key to recovery in these cases. This case series depicts perforation of the gall bladder as a rare cause of neonatal intestinal obstruction.

Case Series:

A full term second born male neonate weighing 3.1 kg was delivered by elective LSCS. The pregnancy and delivery had remained uneventful. The baby was admitted at day 3 of life for phototherapy with a total bilirubin of 13.9 mg/dL and direct bilirubin of 2.8 mg/dL. After 3 days of phototherapy, total bilirubin stood at 9.1 mg/dL, direct bilirubin being 1.1 mg/dL.

Table 1 – Laboratory investigations of first neonate on day 3 of life

	Day 3
TLC	8200 /cu mm (Neutrophils 58% Lymphocytes 42 % Monocytes 0%, Eosinophils 0 % Basophils 0%)
Sr.Sodium	130.5 meq/L
Sr.Potassium	4.1 meq/L
Sr.Chloride	110 meq/L
C- Reactive protein	Negative
Blood Urea Nitrogen	16
Sr.Creatinine	0.6

The baby developed convulsions and fever at day 6 of life.

Table 2 - Laboratory investigations of first neonate on day 6 of life

	Day 6
Hb	15.9 g/dL
TLC	15400 /cu mm (Neutrophils -58%, Lymphocytes – 40%, Eosinophils – 1%, Monocytes- 1%, Basophils – 0%)
Platelets	2.73 lakh/ cu mm
Sr.Sodium	122 meq/L
Sr.Potassium	6.0meq/L
Sr.Chloride	97.1 meq/L

By day 11 of life he had developed abdominal distention and had bouts of bilious vomiting. On physical examination, pallor was present, cry, tone, activity were subnormal, pulse and blood pressure were normal for age and he was afebrile and non icteric. Abdomen was tender without guarding or rigidity and rectum was empty on PR exam. Cardiovascular and respiratory systems were normal.

Laboratory reports were as follows.

Table 3 - Laboratory investigations of first neonate on day 11 of life

	Day 11
Hb	16.9 g/dL
TLC	18500 /cu mm (Neutrophils - 63.70%, Lymphocytes - 19.50%, Monocytes -15.50%, Eosinophils - 0.90%, Basophils – 0.4 %)
Platelets	3.61 lakh/ cu mm
Sr.Sodium	143 meq/L
Sr.Potassium	5.1meq/L
Sr.Chloride	104 meq/L

Lumbar puncture was done. CSF was clear and colourless with proteins and sugar within normal limits and occasional lymphocytes on microscopic examination. A USG of the brain through the anterior fontanelle revealed no structural abnormality, lesion, bleed or edema.

The child was kept nil by mouth and started on intravenous Meropenem at 120 mg 8 hourly and intravenous Amikacin at 45 mg 24 hourly.

An erect radiograph of the abdomen revealed multiple air fluid levels but no free gas under the right dome of diaphragm.

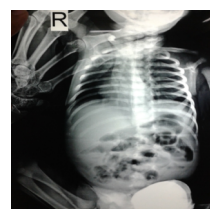


Image 1 – Xray abdomen erect of first neonate showing multiple air fluid levels

On day 12 of life, physical exam showed no change compared to the previous day and the abdominal distention persisted. Laboratory reports were as follows.

Table 4 - Laboratory investigations of first neonate on day 12 of life

	Day 12
Hb	17.4 gm/dl
TLC	12,290/mm ³ (Neutrophils – 90%, Lymphocytes-7%, Monocytes-2%, Eosinophils – 1%, Basophils- 0%)
Platelets	5.2 lakh/ cu mm
Sr.Sodium	134 meq/L
Sr.Potassium	6.1 meq/L
Sr.Chloride	104 meq/L

Ultrasonography of the abdomen showed dilated small bowel loops with sluggish peristalsis and a collapsed colon, hinting at a possible distal ileal obstruction but with no frank malrotation of the gut. SMA was left of SMV. Gall bladder was distended with no calculi and pancreas, spleen and kidney were normal.

After 2 days of failing to respond to conservative management and with rising neutrophilia and electrolyte imbalances setting in, the decision to explore was taken. On day 13 of life, at exploratory laparotomy through a right supraumbilical transverse incision revealed multiple inter bowel loop adhesions and an omental band adherent to the distal ileum, causing intestinal obstruction. On releasing the adhesions, the band and on further exploration, a localised abscess was seen around the gall bladder and with it, a 0.5cm diameter perforation in the body of the gall bladder. Cholecystectomy was done, lavage given and abdominal closure in layers was done after keeping a glove drain in the gall bladder fossa.

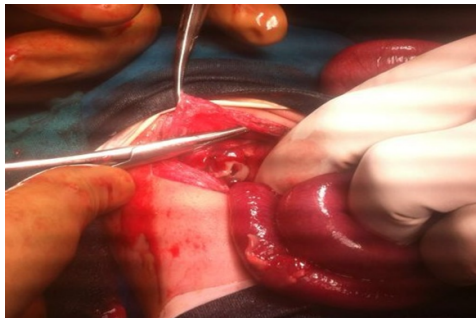


Image 2 – Intra operative finding of gall bladder perforation in first neonate

Table 5 – Post operative course of first neonate

Post operative course of patient	
Post operative day 1	Abdomen soft and distension reduced Electrolytes had normalised (Sr.Sodium 135 meq/l, Sr.Potassium 5.5 meq/L, Sr.Chloride 104 meq/L)
Post operative day 2	Bowels sound returned Patient passed normally pigmented stools
Post operative day 3	Started on breast feeding No vomiting Suture line healthy
Post operative day 7	Patient discharged

The second patient was a full term male child delivered by normal vaginal delivery who presented with abdominal distension from day 4 of life. Patient had a TLC count of 20,000 mm³ and CRP was positive. Xray Abdomen erect of the patient showed multiple air fluid levels. Ultrasonography of abdomen showed presence of small collection in the subhepatic region with dilated bowel loops.

With failure of conservative management for 48 hours, decision for exploratory laparotomy was taken and cholecystectomy, adhesiolysis with peritoneal lavage was done for approximately 0.5 cm gall bladder perforation- located in body- with localised abscess followed by closure after placing a glove drain.

The third patient was a preterm (8 months) low birth weight (1600 gms) male child who presented with abdominal distension since day 5 of life. Xray abdomen erect showed presence of air fluid levels while ultrasonography of abdomen showed presence of dilated bowel loops with subhepatic collection. The patient was taken for exploratory laparotomy and the intraoperative findings were – approximately 0.5cm gall bladder perforation in body with gangrene of gall bladder and localised abscess in subhepatic space- in view of which adhesiolysis and cholecystectomy was done and peritoneal lavage given followed by closure after inserting glove drain.

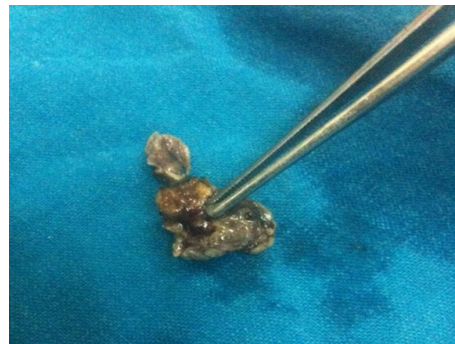


Image 3 – Gangrenous gall bladder specimen in third neonate

The postoperative course of the second and third neonate was uneventful.

Discussion:

Congenital anomalies, infection, reflux of pancreatic secretions, biliary obstruction, and abnormal bile are included in the hypothesis of gall bladder perforation while its pathogenesis remains unknown^(2,5). The most common site of gall bladder perforation is the fundus as this is the most distal part with regard to blood supply^(6,7). A report by Sobbia Gull et al on a 700 g premature neonate who had abdominal distention, icterus and rapid clinical deterioration with hypotension and metabolic acidosis revealed a localised collection of bile in the right subhepatic pouch with a 2 mm perforation in the neck of the gall bladder. This perforation was oversewn with 7/0 polydioxanone⁽⁸⁾. Their article published in Paediatric surgery International journal mentioned only 2 neonatal incidences of spontaneous gall bladder perforation. Both these neonates had symptoms of gastric outlet obstruction as their main feature⁽⁸⁾. The first was that of a neonate who underwent surgery for right sided diaphragmatic eventration. As barium meal suggested external gastric obstruction, a laparotomy was done which revealed a perforation in the gall bladder neck and bilioma around the gastric outlet. Cholecystectomy was performed here. The second case was that of a 2 week old neonate who presented with jaundice since day 2 of life and non bilious vomiting since day 3 of life. Dense adhesions were found between the liver and transverse colon and bile stained fibrinous flakes between the gall bladder and duodenum. In this case a gastrostomy and Roux-en-Y choledochojejunostomy were done.

Even though the case of the neonate described by Gull et al was managed with primary closure of the perforation, the perforation was 2 mm in size with a localised collection of bile in the subhepatic pouch and with the rest of the intestine normal⁽⁸⁾ while in the cases we describe, not only was the perforation much larger (approximately 0.5cm diameter), they were also associated with localised subhepatic abscess, interloop small bowel adhesions and an omental band reaching unto the terminal ileum (in the first

nenonate). These factors, namely the size of the perforation and the presence of pus would make primary closure of the perforation an unsafe and unsure method to treat this case.

Spontaneous rupture of the gall bladder in the neonatal age group although a rare entity in itself, can be thus considered as a cause of intestinal obstruction in the neonate.

REFERENCES

1. Kasat LS, Borwanker SS, Jain M, Naregal A (2001) Spontaneous perforation of the extrahepatic bile duct in an infant. *Pediatr Surg Int* 17:463-464
2. Rhoads K, Snyder J, Lee H (2002) Cholelithiasis and perforated gallbladder in an infant. *J Pediatr Surg* 37:1374-1375
3. Nambirajan L, Chandrasekharam VVSS, Gupta AK, Bhatnagar V (2000) Spontaneous neonatal gallbladder perforation. *Trop Gastroenterol* 21:190-191
4. Kumar V, Chattopadhyay A, Bhat N, Rao PL (2001) Spontaneous biliary perforation presenting as gastric outlet obstruction. *Indian J Pediatr* 68:361-363
5. Sharma R, Mondal A, Sen IB, Sawroop K, Ravishanker L, Kashyap R (1997) Spontaneous perforation of the gallbladder during infancy diagnosed on hepatobiliary imaging. *Clin Nucl Med* 22:759-761
6. Isch JH, Finneran JC, Nahrwold DL. Perforation of the gallbladder. *Am J Gastroenterol* 1971;55:451-8.
7. Abu-Dalu J, Urca I. Acute cholecystitis with perforation into the peritoneal cavity. *Arch Surg* 1971;102:108-10.
8. Sobbia Gull, Michael Singh, James Bruce (2005) Spontaneous gallbladder perforation in a neonate *Pediatr Surg Int* 21:657-658
9. Marcela Beltran Joan , Maria Azucena et al (2015) Spontaneous gall bladder perforation in a preterm neonate *Chilian Journal of Paediatrics* 88:656-661
10. Ying Yi Lu, Hong- Shiee Lai et al Ischemic gall bladder perforation in a premature infant February 2008 *Journal of Paediatric Surgery*