Case Report

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Ruptured liver abscess in a neonate

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ABSTRACT

We report a rare case of 17-day-old neonate, diagnosed to have ruptured liver abscess secondary to Methicillin-resistant *Staphylococcal aureus* infection. The child presented with septicemia and abdominal distension. On exploration, there was pyoperitoneum with ruptured liver abscess.

Key words: Abscess, liver, Methicillin-resistant *Staphylococcus aureus*, neonate, ruptured

INTRODUCTION

Liver abscess is a rare entity in neonate and presentation with ruptured liver abscess is even rarer. We present a case of ruptured liver abscess secondary to MRSA (Methicillin-resistant *Staphylococcus aureus*) infection in a 17-day-old neonate.

CASE REPORT

A 3.5 kg, full-term neonate presented at the age of day 17, with two days history of refusal for feeds, progressive distension of abdomen and bilious vomiting. Before being referred, the child received conservative management. The workup revealed raised total leukocyte count and raised C-Reactive Protein (CRP). The child did not improve on conservative management and the distension persisted with nasogastric tube having continued bilious aspirate. At the time of presentation in our institute, the child was in sepsis with distended abdomen and sluggish bowel sounds. Skiagram abdomen revealed multiple air fluid levels with absent gas in pelvis [Figure 1].



Figure 1: Skiagram abdomen showing multiple air fluid levels

Initial laboratory investigations were total leukocyte count – 16,500/ mm^3 (Neutrophils – 73%), serum sodium – 128 mmol/l and total bilirubin – 8.0 mg/dl (Indirect – 6.9 mg/dl). Blood was sent for the culture and sensitivity test. After initial resuscitation, the child was taken up for surgical exploration with a provisional diagnosis of? intestinal obstruction (? cause), ? necrotising enterocolitis (NEC).

On exploratory laparotomy, 20 ml of pus was present in the right paracolic gutter and right iliac fossa. Left lobe of the liver was found adherent to the anterior abdominal wall and transverse colon, which on separation revealed small abscess cavity of size 2 × 2 cm in the inferior surface of the liver [Figure 2]. Adherent pus flakes were present around the ruptured cavity as well as bowel loops. The abdominal cavity was lavaged with saline and drains were placed. Pus was sent for the culture examination. Both the blood and pus culture were reported positive for MRSA sensitive to clindamycin/ vancomycin/doxycycline/linezolid; the treatment with intravenous vancomycin was started accordingly. The child had progressive improvement over a period of time and was discharged after receiving vancomycin for 14 days. Later on, oral linezolid was given for next

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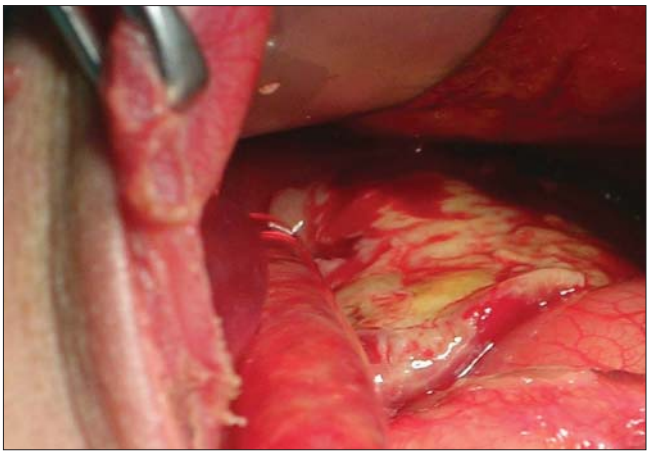


Figure 2: Ruptured small abscess cavity in left lobe of liver with adherent pus flakes

one week. Post-operative period was uneventful, except for the minimal surgical site infection which was managed with local wound care. Repeat blood cultures done at 2 and 3 weeks post-surgery were sterile.

To know the cause and source of infection, detailed questioning of the mother was done which revealed a doubtful history of one episode of pus discharge from the umbilicus without any umbilical redness at the age of day 6. There was no history of maternal infection. The HIV status of parents was negative and the vaginal swab did not grow any organism.

DISCUSSION

Neonatal liver abscess is a rare and lethal entity. It was first reported by Bright in 1836, since then 100 cases of neonatal liver abscess have been reported;[1] of these, solitary types comprise 30% of the reported liver abscess.[2]

Most commonly reported risk factors are umbilical vein/artery catheterization with misplaced catheter and infusion of hypertonic fluids as dextrose and parenteral nutrition.[3] Other risk factors reported are blood culture-positive sepsis, surgery and omphalitis. Some other minor risk factors reported include NEC, infant of the diabetic mother, maternal infections, exchange transfusion, immunodeficiency, asphyxia neonatorum and prematurity.[1,4] In the series reported by Tan *et al*.[1] and Lee *et al*.,[4] every case had a risk factor. Most of the newborns were premature with history of umbilical cannulation. To our surprise, we could not find any source of infection and risk factor except for a doubtful history of one episode of umbilical discharge.

Systemic sepsis and direct contiguous infection are frequent risk factors in neonatal liver abscess.[4] The organisms may reach through systemic circulation, hepatic artery or portal circulation draining the gastrointestinal tract or through direct invasion from the contiguous structures.

The diagnosis of liver abscess is difficult as most of the cases reported in the literature have presented with non-specific features of sepsis, lethargy, vomiting, abdominal distension with ileus and hepatomegaly. The diagnosis should be strongly suspected in a sick neonate with history of umbilical cannulation/abdominal surgery, especially with raised liver enzymes. Hypotension, abdominal distension and ileus are also the modes of presentation. Ruptured liver abscess is an uncommon presentation in newborns, with very few cases being reported in the literature.[1] The abscesses are either single or multiple. The posterior surface of the right lobe is the most common site of occurrence; though they can occur anywhere in the liver, the exact cause of this is not known, the portal drainage pattern is thought to be responsible. Multiple liver abscesses are small, not usually drainable and have fulminant course. Solitary abscesses are larger, well localised, can be drained surgically and usually have sub-acute course. Wide range of bacterial and fungal organisms have been implicated in the pathogenesis of the liver abscess, commonest being Gram-positive *Staphylococcus aureus* including MRSA, coagulase-negative staphylococcus, *Streptococcus pyogenes* and Gram-negative bacilli.[5] Fungal pathogens most commonly *Candida albicans* have been implicated, especially after prolonged antibiotic exposure or compromised immunity.

We label this child to have community-acquired MRSA (CA-MRSA) as this child did not have any history of indwelling catheter or prolonged hospital admission before illness. There has been a substantial increase in the number of CA-MRSA infections in previously healthy newborns.[6]

Laboratory markers for sepsis likely to be positive are raised total leukocytes count, low platelet count or raised C-reactive proteins. Liver function tests may or may not be abnormal. Since the clinical features and the initial laboratory investigations are non-specific, it requires the clinician to have a high index of suspicion, especially in a persistently septic neonate with history of instrumentation of the abdominal or vascular system.[7]

Ultrasonography is the investigation of choice in paediatric patients with a sensitivity of 80 to 90% because of high resolution, portability, lack of prior preparation and easy availability and low cost. Serial imaging is valuable to monitor the response of therapy.

Moreover, real-time imaging allows guided aspiration of the solitary abscess. Computed tomography has the sensitivity of 97% with diagnostic accuracy of more than 95% in adults.

In the personal series and review of literature, Tan *et al*. and Simeunovic *et al*. have recommended management of liver abscess based on whether abscess is single or multiple. Non-operative treatment is seen to be successful in pyogenic liver abscess if the clinical response is to antibiotic therapy is obtained within 24 to 48 hours.[8] Multiple abscesses are usually managed medically with prolonged course of culture-directed antibiotic therapy for 3 to 6 weeks and should be followed with serial ultrasounds. For the single abscesses, early recognition and prompt surgical evacuation or percutaneous drainage is recommended.[7,9] Lee *et al*.,[4] in his series of eight newborns, have demonstrated percutaneous drainage by aspiration and concomitant antibiotic therapy as safe and effective approach. He concluded that prompt percutaneous drainage of solitary abscess in newborn is associated with good results.

Antibiotic therapy is crucial in the management of the liver abscesses managed either conservatively or drained. Duration of the antibiotic therapy depends on the number of abscesses, clinical response to the therapy, radiographic progress and potential toxicity of the chosen drug. Primary surgical drainage is indicated in cases of (1) Ruptured liver abscess on presentation, (2) Multiloculated abscess not responding to antibiotics, (3) Incomplete percutaneous drainage and (4) Known surgical pathology in abdomen.

Pyogenic neonatal abscesses are uniformly fatal if untreated. In a recent review of 41 non-surgical neonatal liver abscesses by Shah *et al*.,[10] an overall mortality of 58.5% was identified which declined after 1990 (82.6% to 27.8%). He concluded that Gram-negative infections were associated with increased mortality. On the other hand, use of vancomycin (regardless of the organism), single infectious organism and use of surgical drainage with concomitant antibiotics were associated with good survival.

In the present scenario, the prognosis of liver abscess in the neonates has considerably improved due to rapid diagnosis, availability of better imaging, better bacteriological identification, availability of effective antibiotics and development of better drainage procedures.

REFERENCES

1. Tan NW, Sriram B, Tan-Kendrick AP, Rajadurai VS. Neonatal hepatic abscess in preterm infants: A rare entity? Ann Acad Med Singapore 2005;34:558-64.
2. Moss TJ, Pysher TJ. Hepatic abscess in neonates. Am J Dis Child 1981;135:726-8.
3. Krauss AN, Albert RF, Kannan MM. Contamination of umbilical catheters in new born infant. J Pediatr 1970;77:965-9.
4. Lee SH, Tomlinson C, Temple M, Amaral J, Connolly BL. Image guided percutaneous needle aspiration or catheter drainage of neonatal liver abscess: 14 year experience. AJR Am J Roentgenol 2008;190:616-22.
5. Guillois B, Guillemin MG, Thoma M, Sizun J, Monnery JL, Alix D. [Neonatal pleuropulmonary staphylococcal infection with multiple abscesses of the liver]. Ann Pediatr (Paris) 1989;36:681-4.
6. So TY, Farrington E.Community-acquired methicillin-resistant *Staphylococcus aureus* infection in the pediatric population. J Pediatr Health Care 2008;22:211-7.
7. Simeunovic E, Arnold M, Sidler D, Moore SW. Liver abscess in neonates. Pediatr Surg Int 2009;25:153-6.
8. Moore SW, Millar AJ, Cywes S. Liver abscess in childhood. Pediatr Surg Int 1988;3:27-32.
9. Joseph VT. Liver abscess. J Paediatr Child Health 1997;33 Suppl 1: S25.
10. Shah SI, Hudak J, Meng HD. Meta analysis of factors associated with survival of neonatal hepatic abscess. Pediatr Infect Dis J 2010;3: 215-20.

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