



Infant appendicitis with perforation: a case report

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ABSTRACT

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Appendicitis is one of the most common surgical emergencies in children. In the USA, there are 70,000 cases are diagnosed each year. Acute appendicitis is a rare case, barely considered in the diagnoses, and probably causes acute abdominal sepsis in neonates. It affects males generally 75% of the time and 25%-50% of all reported cases occur in premature infant. Almost 50 cases have been reported over the last 30 years. We reported a 5 month-old baby girl whom transferred to our hospital from a peripheral hospital. Previously, the baby diagnosis was low-type obstruction. At the time of admission to our hospital, the baby presented with a history of abdominal distension and did not pass stools after 48 h. Oxygen and oral gastric tube were administered. Exploratory laparotomy surgery was performed through a transverse incision. This report is a retrospective review of one patient with appendicitis perforation presented in our hospital.

ABSTRAK

Apendisitis adalah salah satu keadaan darurat bedah paling umum pada anak-anak. Di AS ada 70.000 kasus didiagnosis apendisitis setiap tahun. Apendisitis akut adalah kasus yang jarang, hampir tidak dipertimbangkan dalam diagnosis, dan mungkin menyebabkan sepsis pada neonatus. Sebesar 75% apendisitis umumnya terjadi pada laki-laki dan 25 - 50% dari semua kasus yang dilaporkan pada bayi prematur. Hampir 50 kasus telah dilaporkan selama 30 tahun terakhir. Kami melaporkan bayi perempuan berumur 5 bulan dipindahkan ke rumah sakit kami dari rumah sakit perifer. Sebelumnya, bayi didiagnosis obstruksi tipe rendah. Pada saat masuk ke rumah sakit, bayi memiliki riwayat perut kembung dan tidak buang air besar setelah 48 jam. Oksigen dan *oral gastric tube* diberikan. Operasi eksplorasi laparotomi dilakukan melalui sayatan tranversal. Laporan ini adalah tinjauan retrospektif dari satu pasien dengan perforasi apendisitis yang disajikan di rumah sakit kami.

Keywords:
appendicitis;
perforation;
surgery;
infant;
laparotomy;

INTRODUCTION

Appendicitis is one of the most common surgical emergencies in children. In the USA, there are 70,000 cases are diagnosed each year. The risk of appendicitis-related deaths in boys around 9% and in girls 7%.¹ Acute appendicitis rarely causes acute abdominal sepsis in neonates and is hardly considered in the differential diagnoses. It was recorded that as much

as 0.04-0.2% of the incidence of neonatal appendicitis has been reported.² The incidence in males is about 75% of the time, and 25%–50% of all reported cases occur in newborns.³⁻⁸ Over the last 30 years at least less than 50 cases have been reported,³ with a mortality rate ranging between 20% and 25%.^{2,5,7} Infant perforated appendicitis is a rare condition related to mortality and morbidity.⁹ Due to un-specific clinical presentation, late diagnosis well as

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surgical intervention delaying occurred in mostly neonatal appendicitis leading to high morbidity and mortality. As well as the rarity of neonatal appendicitis (NA), the lack of specific signs and a low index of suspicion have led to delays in diagnosis and surgical intervention.^{10,11} In most health care facilities, the diagnosis is generally made during laparotomy for intestinal perforation neonatal cases.¹² We reported here a baby girl whom diagnosed appendicitis with perforation.

CASE

A 5 month-old baby girl was transferred to our hospital from peripheral hospital. The baby was diagnosed with low-type obstruction by the peripheral hospital. The baby girl was born from a 46-year old primigravida at 33 weeks gestation by spontaneous

vaginal delivery with a birth weight of 2.5 kg. At the time of admission to our hospital, the baby girl presented with a history of abdominal distension and did not pass stools after 48 h. Oxygen and oral gastric tube were administered.

Abdominal X-ray result showed distended bowel and air-fluid level. A diagnosis of bowel obstruction was made. Emergency surgery was planned. Fluid, electrolytes, parenteral nutrition, and intravenous antibiotics were administered before the surgical intervention. Exploratory laparotomy was performed through a transverse incision. This surgical operation revealed appendicitis perforation and an appendectomy was performed. The baby girl had an uneventful post-operative recovery. At 3 days and one month postoperative examination, the baby was doing well.



FIGURE 1. Abdominal X-Ray exhibits air-fluid level and bloated bowel

DISCUSSION

A rare case, barely considered in

the diagnoses, and probably cause of acute abdominal sepsis in neonates is distinctive of acute appendicitis. The

symptoms of appendicitis can alter according to a child's age. In 2 years old toddler or younger, the most common symptoms are bloated or swollen abdomen followed by cramp and less vomiting.^{9,13} White blood cell count (WBC) and C-reactive protein (CRP) are generally used immediately upon acute appendicitis is suspected.¹⁴ More than 90% of children with acute appendicitis appear WBC above 10,000 and often left shift but not finding. In radiography with ultrasound imaging discover a non-compressible, and fluid-filled appendix with a diameter of more than 6 mm.¹

Single-dose antibiotic prophylaxis therapy considers being given preoperatively while the appendicitis diagnosis has been made. A second-generation cephalosporin against anaerobic bacteria or third-generation cephalosporin against partial anaerobic bacteria is mostly recommended besides the adjunct of metronidazole.¹ One of the most complications is perforated appendicitis instead, use a single dose and one regimen antibiotic, need "triple" antibiotic regimen (e.g. gentamycin, ampicillin, and metronidazole or clindamycin), or a combination (e.g. metronidazole/ceftriaxone or ticarcillin/clavulanate and gentamycin).¹³

The circumstance which contributes to a high mortality rate as a result of peritonitis and perforation is a flimsy appendicular wall and caecum that can't bloatedly incline to appendicular perforation in neonatal appendicitis. On the other hand, the underdeveloped and relatively meager size peritoneal space with the lower physiological reserve is a potential explanation of the swift spread of infection. In absence of conjecture of Hirschsprung's disease, the preferred line of management is simple appendectomy along with peritoneal lavage beside warm saline.¹ Because of these conditions, maintaining a high index of suspicion for appendicitis in neonates and infants presenting with

intra-abdominal sepsis of unclear etiology was highly recommended.¹⁵

CONCLUSION

Infant perforated appendicitis demands a vigorous clinical suspicion and remains to be a challenging diagnostic. This case emphasizes an unusual manifestation of infant appendicitis in which the radiological and clinical features were towards midgut volvulus. This profitably manages to emergency laparotomy which affirms the diagnosis. Good management will resolve the convenient result of treatment.

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REFERENCES

1. Podany AB, Tsai AY, Dillon PW. Acute appendicitis in pediatric patients: an updated narrative review. *J Clin Gastroenterol Treat* 2017; 3(1):1-9. <https://doi.org/10.23937/2469-584X/1510042>
2. El-Gohary MA, Aljubouri S. Neonatal appendicitis with perforation: A case report. *J Ped Surg Case Reports* 2014; 2:353-4.
3. Drapala B, Trognon B, Canarelli JP, Tientcheu AT, Bensatti L, Razarimanantsoa L, et al. Appendicite neonatale. *Archives de pédiatrie* 2000; 8(7):896-7. [https://doi.org/10.1016/S0929-693X\(00\)80205-5](https://doi.org/10.1016/S0929-693X(00)80205-5)
4. Arora NK, Deorari AK, Bhatnagar V, Mitra DK, Singhal PK. Neonatal appendicitis: a rare cause of surgical emergency in preterm babies. *Indian Pediatr* 1991; 28(11):1330-3.
5. Deguchi E, Iwai N, Yanagihara J, Nakamura K, Doi Y. Neonatal appendicitis with perforation in a

- premature infant. *Pediatr Surg Int* 1990; 5(5):366-8.
<https://doi.org/10.1007/BF00177109>
6. Karaman A, Çavusoglu YH, Karaman I, Cakmak O. Seven cases of neonatal appendicitis with a review of the English language literature of the last century. *Pediatr Surg Int* 2003; 19(11):707-9.
<https://doi.org/10.1007/s00383-003-1030-5>
 7. Ruff ME. Neonatal appendicitis with perforation. *Am J Dis Child* 1991; 145:111-2.
 8. Shaul WL. Clues to the early diagnosis of neonatal appendicitis. *J Pediatr* 1981; 98(3):473-6.
[https://doi.org/10.1016/S0022-3476\(81\)80727-5](https://doi.org/10.1016/S0022-3476(81)80727-5)
 9. Gajbhiye AS, Dakhore SD, Meshram MM, Khatod AP. Perforated appendicitis in children. *OSR-JDMS* 2013; 11(1):9-16.
<https://doi.org/10.9790/0853-1110916>
 10. Gil AT, Morais S, Faria D. Neonatal appendicitis—an uncommon diagnosis, not to be Forgotten. *JSM Clin Case Rep* 2014; 2(4):1048.
 11. Managoli S, Chaturvedi P, Vilhekar KY, Gupta D, Ghosh S. Perforated acute appendicitis in a term neonate. *Indian J Pediatr* 2004; 71:357-8.
<https://doi.org/10.1007/BF02724108>
 12. Rintala RJ, Pakarinen MP. Operative pediatric surgery: Appendectomy : open and laparoscopic approaches. In: Spitz L, Coran AG, editors. *Operative Pediatric Surgery* 7th ed, New York: CRC Press, 2013; 478-86.
 13. Esposito C. Appendicitis. In: Sinha CK & Davenport M editors. *Handbook of Pediatric Surgery*. New York: Springer, 2010: 183-8.
 14. Archarya A, Markar SR, Ni M, Hanna GB. Biomarkers of acute appendicitis: systematic review and cost-benefit trade-off analysis. *Surg Endosc* 2017; 31:1022-31.
<https://doi.org/10.1007/s00464-016-5109-1>
 15. Bence CM, Densmore JC. Neonatal and infant appendicitis. *Clinics in perinatology* 2020; 47(1): 183-96.
<https://doi.org/10.1016/j.clp.2019.10.004>