Radiological Quiz

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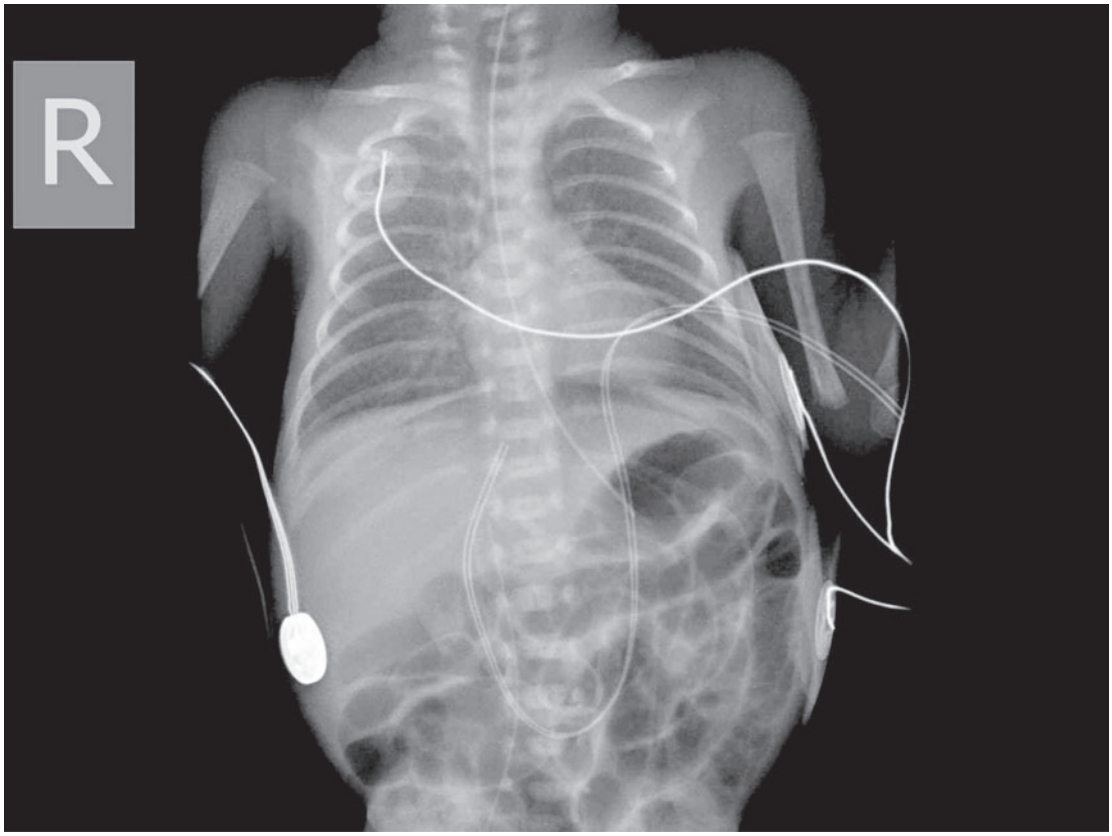
A preterm baby was born at 24 weeks' gestation by emergency caesarean section with birth weight 615 grams. He was intubated and given surfactant before weaning to non-invasive ventilation on day 2. Trophic enteral feeding was given on day 3 and then withheld, as he received three doses of ibuprofen on day 4 to day 6 as treatment for patent ductus arteriosus. Total parental nutrition was given via a double-lumen umbilical venous catheter. Mild abdominal distension was noted on day 7, while bowel opening was normal and vital signs were stable. A central venous catheter was inserted via the great saphenous vein of right foot on day 7 and a supine X-ray was taken to confirm its position, as shown.



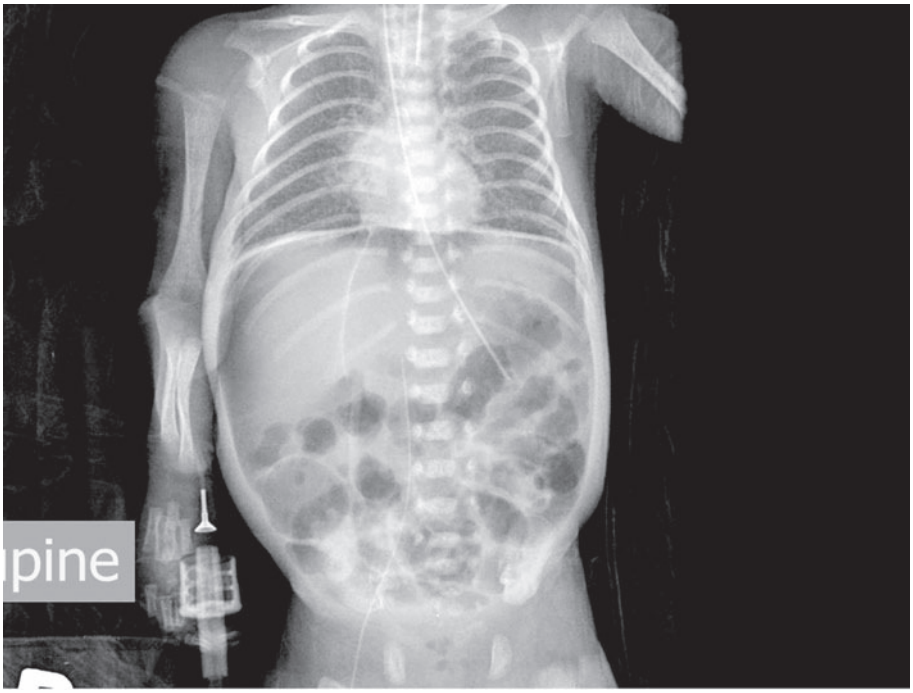
Question
What did the X-ray show?
A. Pneumoperitoneum
B. Necrotizing enterocolitis
C. Diaphragmatic hernia
D. Hiatus hernia
E. Normal abdominal X-ray with optimal position of long line

(Answer on page 16)

Answers to Radiological Quiz on page 15

Answer: A

The X-ray showed a crescent-shaped lucency just below the diaphragm, outlining the upper border of liver. X-ray was repeated (see below) showing more free gas subsequently. Emergency laparotomy revealed moderate amount of fecalent material in the peritoneal cavity and a 3 mm perforation at distal ileum. The rest of the bowel was healthy. Small bowel resection and ileostomy were performed.



The incidence of neonatal spontaneous intestinal perforation is estimated to be between 1.1% and 7.4% of all neonatal intensive care unit admissions of infants less than 1500 g and less than 1000 g, respectively.[1] Proposed mechanisms include embolic phenomena, local inhibition of prostaglandin production, insufficient collateral circulation of the antimesenteric border of the bowel, and congenital defects of the intestinal musculature.[2] The characteristic clinical presentation is rapid development of abdominal distension due to free gas and subsequently meconium discoloration seen through the thin anterior abdominal wall in an otherwise relatively stable premature neonate. This scenario, in conjunction with radiological evidence of a pneumoperitoneum without features of necrotizing enterocolitis, is pathognomonic of spontaneous intestinal perforation. Whilst the perforation may involve other sites, including the stomach, duodenum and colon, perforation of the distal small bowel is the most common location.[2] While ibuprofen is as effective as indomethacin in promoting ductal closure in premature infants,[3] both drugs have been linked to spontaneous intestinal perforation.[4]

References

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3. Van Overmeire B, Smets K, Lecoutere D, Van de Broek H, Weyler J, De Groote K, Langhendries JP. A comparison of ibuprofen and indomethacin for closure of patent ductus arteriosus. N Eng J Med 2000;343(10):674-81.
4. Lago P, Bettiol T, Salvadori S, Pitassi I, Vianello A, Chiandetti L, et al. Safety and efficacy of ibuprofen versus indomethacin in preterm infants treated for patent ductus arteriosus: a randomised controlled trial. Eur J Pediatr 2002;161(4):202-7.