Neonatal gastric perforation with tension pneumo-peritoneum

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ABSTRACT

A case of neonatal gastric perforation presenting as acute abdominal compartment syndrome manifesting as refractory metabolic acidosis and difficulty in ventilation during transfer is described. Plain abdominal X-ray and decubitus view were helpful in defining a perforation of a hollow viscous. On arrival, she needed immediate needle decompression followed by an exploratory laparotomy and repair of the gastric perforation and a temporary tube gastrostomy. The baby did well postoperatively and was discharged home in 6 days. Neonatal gastric perforation is a serious and potentially life threatening condition. Long distance to tertiary center and a prolonged transfer time mandates that the tension pneumo-peritoneum is relieved by needle compression by the transfer team at the base hospital.

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Neonatal gastric perforation, although rare, has serious consequences and is potentially life threatening [1–11]. A high index of suspicion is essential for an early diagnosis. Management depends on the extent and the timing of detection of persistent progressive tension pneumo-peritoneum. During transfer the leak around endo-tracheal tube worsens the abdominal compartment syndrome leading to splinting of the diaphragm and reduction of the venous return. This can cause profound combined metabolic and respiratory acidosis unresponsive to fluid boluses.

1. Case report

A baby girl was born at 34 + 2/40 gestation with a birth weight of 2840 g by an induced vaginal delivery at a small district general hospital (DGH). At birth she was in a very good condition needed no resuscitation. Antenatal scans and period was uneventful apart from spontaneous rupture of membranes at 30 weeks. The mother was given two doses of dexamethasone and started on nifedipine from spontaneous rupture of membranes at 30 weeks. The mother was grunting and had a shallow respiratory and metabolic acidosis which was not responsive to venous return and splinting of the diaphragm.

On arrival, she needed decompression of her abdomen with a wide bore cannula. Her respiration immediately improved and the pressures on the ventilator got reduced before going to theater. On the extent and the timing of detection of persistent progressive tension pneumo-peritoneum. During transfer the leak around endo-tracheal tube worsens the abdominal compartment syndrome leading to splinting of the diaphragm and reduction of the venous return. This can cause profound combined metabolic and respiratory acidosis unresponsive to fluid boluses.

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Abdominal cavity was thoroughly lavaged with warm saline. A pyloric nasojejunal tube was passed to start early feeds. The layers and a temporary tube gastrostomy was fashioned. A trans-anterior wall of the stomach near the lesser curvature just distal to the gastro-esophageal junction. The perforation was closed in two layers and a temporary tube gastrostomy was fashioned. A transpyloric nasojejunal tube was passed to start early feeds. The abdominal cavity was thoroughly lavaged with warm saline.

Her post-operative period was uneventful and she was extubated the following morning. Enteral feeds were started on 3rd post-operative day, which she tolerated well and they were gradually increased to full feeds. Her bilirubin remained high and she needed phototherapy. She was discharged home after 6 days. Her gastrostomy was removed in clinic after 4 weeks and it closed spontaneously. At 2 year follow up she is thriving well and is completely asymptomatic.

2. Discussion

Gastric perforation with resultant tension pneumo-peritoneum is a rare but serious and life-threatening condition in neonates [1]. A variety of causative factors including prematurity, vigorous resuscitation, nasal CPAP, perinatal stress, distal obstruction, nasogastric tube trauma have been suggested rather than spontaneous perforation [3]. Our patient did not need any support in form of ventilation or nasal CPAP at birth but had nasogastric tube inserted for feeding. Baby was slow to accept breast or bottle feeds initially so a decision was taken at the initial special care baby unit to insert nasogastric tube for feeding. It is, therefore, more likely to be a tube associated gastric perforation. If she would have been nipple fed, this problem of acute neonatal gastric perforation would have been avoided altogether.

The clinical presentation is very characteristic with rapid deterioration of general condition after the feeds are started. Abdominal distension, increasing aspires and pneumo-peritoneum on transillumination or abdominal X-ray are hallmarks as described in literature [1–5]. Transillumination is a quick and easy technique for diagnosing pneumo-peritoneum and obviates the need for frequent radiographs [2].

Tension pneumo-peritoneum following neonatal gastric perforation complicates the matter as despite intubation, the ventilation remains difficult and the acidosis becomes refractory with combined metabolic and respiratory component [1,11]. Because of regionalization of the neonatal transfer team it sometimes takes much longer to transfer them to tertiary units. Many staff members at smaller neonatal units lack the skill set to safely transfer sick infants. A wide bore cannula decompression is an easy and life saving technique and the medical team responsible for neonatal transfers should familiarize themselves with the technique. It’s useful in many other similar situations, which they may confront during transfers such as premature babies with perforated necrotizing enterocolitis. Early diagnosis and prompt management should improve the prognosis of this potentially life threatening problem.

The conventional treatment of gastric perforation is immediate laparotomy and suturing of the rent. Laparoscopy has been described for the repair, but under the circumstances of acute compartment syndrome due to tension pneumo-peritoneum it may not be feasible due to deranged physiology [7]. The prognosis is poor if it is detected late and prompt management has not been done. Mortality rates as high as 70% been reported in literature.

3. Conclusion

Neonatal gastric perforation with tension pneumo-peritoneum is a rare but life threatening condition. Due to regionalization of the neonatal transport teams there are delays in transfer and loss of skills of staff at smaller neonatal units. In the case of tension pneumoperitoneum the transferring staff may need to perform needle decompression to stabilize the infant, and help decrease the chances of life-threatening events during transfer. This will avoid any life threatening events during transfer. The outcome of this intervention is excellent and technique is easy to learn. Subsequent definitive surgical treatment can be done at the regional neonatal surgical unit. Our case is the powerful reminder of the fact that gastric perforations may be more likely to cause tension pneumoperitoneum because of the large volume of air, as opposed to small or large intestinal perforations, in which the diagnosis of pneumoperitoneum may be more difficult to recognize.

References


