

Laparoscopic repair of acute volvulus in a neonate with malrotation

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Received: 23 January 1995/Accepted: 2 March 1995

Abstract. This report describes the laparoscopic repair of acute volvulus in a neonate with malrotation.

Key words: Malrotation — Volvulus — Laparoscopic repair

With normal rotation and fixation, the mesentery is broad-based. Because of the narrow pedicle formed by the base of the mesentery in malrotation, volvulus of the midgut may occur [1]. The majority of patients with midgut volvulus present in the 1-year of life, about one-third within the 1st 7 days. Primary presenting sign is the sudden onset of bilious vomiting and emptying of the distal colon. As vascular compromise increases, intraluminal bleeding may occur. The patient develops a firm, distended abdomen; hypovolemia; and shock. Midgut volvulus is one of the most severe emergencies seen in the neonate or infant requiring immediate treatment. This report describes the laparoscopic repair of acute midgut volvulus in a 7-day-old girl with malrotation.

Materials and methods

A 7-day-old term-borne girl (3,530 g) was referred because of bilious vomiting. A plain abdominal X-ray on the 2nd day of life displayed no signs of a double bubble. An upper-GI performed on day 6 showed an obstruction in the descending part of the duodenum. The child was placed in a supine position on a short operating table with

the monitor at the head end of the table. The surgeon was positioned at the lower end with the assistant to his right and scrub nurse to his left. Three 5-mm trocars were placed. The first trocar was introduced through the umbilicus via an "open" procedure (pressure 5 cm H₂O, flow 1 l/min). The two other trocars were positioned under direct vision in a horizontal line with the umbilicus, since it seemed the most appropriate location under the circumstances in this patient. The small intestines were identified to be vital, but anticlockwise rotated over 360°. With careful brushing the small intestines could be derotated, displaying the narrow vascular pedicle. In order to free the ascending colon from its inappropriate attachments the small intestines were temporarily brushed to the left side of the vertebral column. The ascending colon could then be completely mobilized and positioned in the left upper abdominal quadrant. Appendectomy was performed using electrocautery dissection and a ligating loop (Surgitie, United States Surgical Cooperation). Finally, the small intestines were brushed back to the right side of the vertebral column and the duodenum was maximally freed of attachments, broadening the vascular pedicle as much as possible. The trocars were removed under direct vision and the wounds were closed subcutaneously with Vicryl 5 × 0. Recovery was uneventful and feeding was resumed the following day.

Discussion

Characteristic in malrotation is the right-sided position of the small intestines. The duodenum does not return to Treitz's ligament. Therefore, the attachment sustains only a narrow pedicle that easily rotates around the vascular axis, causing rapid strangulation. Management consists of surgical derotation, release of inappropriate bands, and broadening of the vascular pedicle. With increasing experience in minimal invasive surgery in pediatric patients this technique may also be applicable in children with midgut volvulus due to malrotation. Because of the small angle of vision in laparoscopy exact knowledge of the anatomy in malrotation is mandatory. On the other hand, magnification through the laparoscope provides an excellent view and allows meticulous dissection of inappropriate

bands and adhesions. Pneumoperitoneum at 5 mm H₂O is well tolerated. The procedure lasted 90 min and the patient recovered well from the procedure.

We conclude that midgut volvulus in malrotation can be managed well laparoscopically in neonates. The advantages of the current observation with quick recovery will have to be further substantiated in a series of patients.

Reference

1. Smith EI (1986) Malrotation of the intestine. In: Welch KJ, Randolph JG, Ravitch MM, O'Neill Jr JA, Rowe MI. (eds) *Pediatric surgery*, 4th ed. Year Book Medical Publ. Inc., London, pp 882–895

Note added in proof: Meanwhile five further neonates have been managed in this way. The procedure should be consigned only to experienced laparoscopic pediatric surgeons.