ROBOTIC-ASSISTED REPAIR OF DIAPHRAGMATIC EVENTRATION FOR SMALL BOWEL VOLVULUS IN AN ADULT: A UNIQUE CASE REPORT

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INTRODUCTION

- Eventration is a diaphragmatic defect often sustained from blunt force injury that thins muscle fibers without rupture and can enable abdominal viscera to protrude into the thoracic cavity
- Eventration causing volvulus of the stomach or colon is well-documented; however, rare reports involving small bowel are exclusive to pediatric diaphragmatic hernias—there are no published cases linking diaphragmatic eventration with volvulus of the small intestine in adults
- Here we describe surgical management for a diaphragmatic eventration allowing intermittent small intestine volvuli

CASE DESCRIPTION

- 37-year-old male evaluated for intermittent severe abdominal pain
  - 30-months of recurrent episodes characterized by acute epigastric and right-upper quadrant pain with associated dry heaves
  - Symptoms would spontaneously resolve
- Additional history:
  - Suffered motor vehicle collision 13-years prior without any surgeries
  - Otherwise healthy, active-duty military member
- Review of records and imaging that had been obtained prior to referral to our clinic revealed:
  - Left-sided diaphragmatic eventration with small bowel volvulus (Fig. 1)
  - Intermittent occurrence evidenced by spontaneous resolution as captured on follow-up CT scans (Fig. 2)
- Surgical repair via robotic-assisted laparoscopy using an abdominal approach (see “Key Intraoperative Findings & Steps”)
- Patient tolerated the surgery and post-operative course without complication
- Followed up post-operatively with subjectively improved breathing, without any recurrent abdominal symptoms, and with an even diaphragm on chest X-ray without pneumothorax (compare Figs. 3 & 4)
- At 6-months follow-up, remained symptom free and was appropriately released to full, unrestricted activity
- Continues to be free of any bowel-obstruction symptoms, abdominal pain, or recurrence of volvulus



Fig. 1: (initial outside CT-19AUG) Sequential axial contrast-enhanced CT images (superior to inferior; L to R) demonstrate swirling of the small bowl mesentery (red arrows) and mesenteric edema (blue arrows)

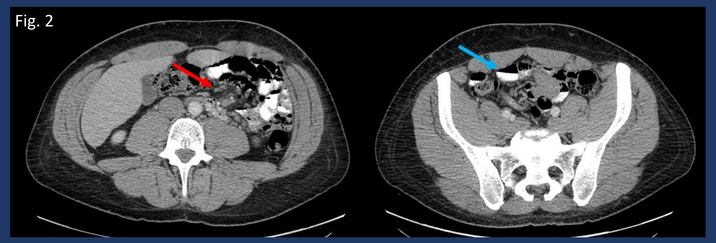
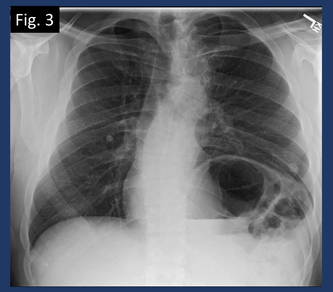


Fig. 2: (interval outside CT-09SEPT) Axial images from follow-up contrast-enhanced CT abdomen (L) and pelvis (R) show resolution of volvulus (red arrow) and enteric contrast in the distal small bowel (blue arrow)



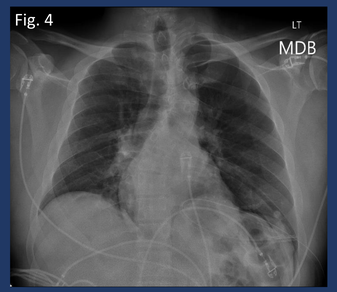


Fig. 3: (Preop CXR-20JAN) Shows left diaphragmatic eventration with gas filled stomach and left colon
Fig. 4: (Postop CXR-11FEB) Demonstrates symmetric diaphragm indicative of successful diaphragm repair

For References/Corresponding Author

SCAN HERE

http://tiny.cc/EventrationPoster

KEY INTRAOPERATIVE FINDINGS & STEPS

1) Transabdominal laparoscopy used to visualize the left hemi-diaphragm and showed a large eventration involving stomach, spleen, transverse colon, and small bowel
2) Elevated hemi-diaphragm was fenestrated to allow for surgical manipulation of redundant diaphragm
3) Laparoscope was passed through fenestration to inspect the thoracic cavity, revealing no adhesions within the left chest
4) Left thoracostomy tube was placed under direct visualization
5) After withdrawing laparoscope back into the abdomen, redundant diaphragm was plicated and resected using an endoscopic stapler
6) Robotic-assisted imbrication and reinforcement of staple line completed with pledgeted sutures
7) Inspection of small bowel: all viable with confirmation of elongated mesentery coupled with eventration as putative causes for symptoms

DISCUSSION

- Volvulus of visceral organs can cause gastrointestinal tract obstruction and risks life-threatening tissue ischemia
- Risks are amplified in the active-duty population with potential for being deployed in austere settings, remote from advanced surgical capabilities
- Our unique case presents the only one of its kind—an adult with diaphragmatic eventration leading to intermittently resolving small bowel volvuli with clear indications for repair

CONCLUSION

- A paucity of literature associating diaphragmatic eventration with small intestine volvulus in adults renders this case of particular interest
- Coupled with the potential threat for bowel compromise from a recurrent volvulus, this case report serves as a reference for surgeons, particularly with patients in austere or rural environments, to consider surgical management in the similarly at-risk patient

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