Case Reports in Women's Health 36 (2022) e00468

Contents lists available at ScienceDirect

Case Reports in Women's Health

journal homepage: www.elsevier.com/locate/crwh

Intussusception after injury to the small intestine during emergent cesarean delivery of a premature triplet pregnancy: A case report

Allen Star *, Valeria Ripa, Fariha Sheikh, Wei Wei Zhang

Department of Surgery, Rutgers New Jersey Medical School, 185 S Orange Ave G506, Newark, NJ 07103, USA

ARTICLE INFO

Keywords:
Intussusception
Pregnancy
Obstruction
Small bowel
Delivery

ABSTRACT

Intussusception is a rare cause of intestinal obstruction in the postoperative setting. This report describes a rare case of intussusception in the early postoperative period following an emergent cesarean delivery of a premature triplet pregnancy, where the small intestine was fully transected. The intestine was repaired with a stapled primary side-to-side functional end-to-end anastomosis. Five days after being discharged, the patient was readmitted due to a small bowel obstruction due to intussusception. The anastomotic site was acting as the lead point, and it required resection. Bowel continuity was reestablished with a hand-sewn anastomosis in end-to-end fashion. The patient had an uneventful recovery and was discharged home. All three neonates were eventually discharged home and the patient was able to start breast feeding. This is believed to be the first case in the obstetric literature where intussusception occurred after intestinal repair of transected bowel during an obstetric emergency.

1. Introduction

Intussusception is the pathologic telescoping of a proximal segment of the gastrointestinal tract into an adjacent segment [1]. This pathology is commonly seen in the pediatric population, though it is rare in adults. In fact, ileocolic intussusception is one of the most common abdominal emergencies in pediatric patients under three years old [2]. Intussusception in adults is commonly due to a pathological lesion serving as the lead point in up to 93% of cases [3]. There are reports in the literature of intussusception following bowel resection, where the lead point consists of an intestinal anastomosis [4–8]. This report presents an atypical case, in which the lead point was a staple line from a small bowel repair that was transected during emergent cesarean delivery of premature triplet pregnancy.

2. Case Presentation

A woman in her late 20s presented to hospital with vaginal bleeding in preterm labor with a triplet pregnancy. She had undergone in vitro fertilization overseas 29 weeks and 5 days prior to presentation, which required 3 embryo transfers. Her medical history was significant for sickle cell trait, pelvic inflammatory disease, bilateral tubo-ovarian abscess, endometriosis, infertility, anemia, and four spontaneous abortions. The patient reported that she had woken up to go to the bathroom and passed a large amount of blood. She came immediately to the emergency room. She had previously established her prenatal care in the hospital.

On initial presentation, the patient was hemodynamically stable; her heart rate was 76 bpm, blood pressure 137/82 mmHg. Blood work was significant for a hemoglobin level of 13.5 g/dL. The physical exam showed dilated cervix with identified amniotic sac and blood in the vagina. Bishop score was 11, based on 6 cm dilation, 80% effacement, −2 station, soft consistency and anterior position of the cervix. Individual fetal evaluation showed 130 to 140 bpm heart rate with moderate variability, acceleration, and absent decelerations. The decision was made to treat the patient with celestone and magnesium for neuroprotection and to proceed with cesarean section given preterm labor with triplet pregnancy.

The surgery was complicated by extensive pelvic adhesions and scarring. The first triplet was delivered breech, Apgar scores of 8 and 9, weight 1115 g. The second triplet was delivered cephalic and noted to be deep in the pelvis, Apgar scores of 6 and 8, weight 1120 g. The third triplet was delivered breech, Apgar scores of 9 and 9, weight 1070 g.

Post-delivery, the obstetricians obtained hemostasis and identified bladder and small bowel injuries, for which intraoperative consults were placed to urology and general surgery. A horizontal 7 cm bladder injury

* Corresponding author.
E-mail addresses: astar024@fiu.edu (A. Star), vr327@njms.rutgers.edu (V. Ripa), sheikhf@njms.rutgers.edu (F. Sheikh), Wz280@njms.rutgers.edu (W.W. Zhang).

https://doi.org/10.1016/j.crwh.2022.e00468
Received 15 October 2022; Received in revised form 11 November 2022; Accepted 14 November 2022
Available online 15 November 2022
2214-9112/© 2022 Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

was repaired in two layers. In order to approach the small bowel injury, extensive adhesiolysis was performed. After releasing the adhesions with sharp and blunt dissection, and the small bowel was freed from surrounding tissue. A complete bowel transection was identified at the mid-jejunum. The small bowel edges were debrided to healthy tissue. A primary side-to-side functional end-to end small bowel anastomosis was performed with a 75 mm blue-load GIA stapler. The common enterotomy was then closed in two layers with running 3–0 Vicryl, and then imbricated with 3–0 silk Lembert sutures. The anastomosis was inspected and found to be patent and hemostatic, and the abdominal fascia was closed.

The patient progressed appropriately in the immediate postoperative course and was discharged home ten days later with a foley catheter. She returned to the emergency room the following day complaining of diffuse abdominal pain, nausea, and vomiting despite continuing to pass flatus and reporting bowel movements. A CT scan showed a peripherally enhancing fluid collection surrounding the uterus consistent with abscess. No dilated loops of bowel were appreciated to suggest an obstruction. The patient was admitted for intravenous antibiotic treatment of the pelvic abscess and a urinary tract infection. An abdominal x-ray performed the next day showed progression of the oral contrast to the rectum (Fig. 1).

The patient initially improved with intravenous broad-coverage antibiotics and fluids. She was able to tolerate a regular diet and continued to have bowel function. On postoperative day 15, her abdominal pain and distention worsened. A repeat CT scan was consistent with intussusception and showed a mesenteric swirl in the right upper quadrant concerning for volvulus and bowel obstruction (Figs. 2,3).

The patient was taken for an emergent exploratory laparotomy. Two areas of small bowel volvulus were identified, with the bowel twisted on itself at the mesentery without apparent ischemic changes. A small bowel intussusception was encountered in the right upper quadrant. The lead point of intussusception appeared to be the small bowel anastomosis staple line. The intussusception was reduced by applying sequential pressure to the intussuscepted intestine. The total area of telescoping bowel was close to 50 cm. The telescopic part of the small bowel appeared to have patches of necrosis that were white and apparently nonviable (Fig. 4). A total of 130 cm of small bowel was resected up to healthy viable areas of bowel for anastomosis. The primary anastomosis was created in an end-to-end fashion and was hand-sewn in two layers with 3–0 PDS. The mesenteric defect was closed with 3–0 Vicryl. The abdomen was irrigated and closed.

A nasogastric tube was inserted for gastric decompression. The patient had an uneventful recovery from that point on. She resumed oral feeding on postoperative day 3. An x-ray cystoscopy confirmed the absence of a bladder leak on postoperative day 7, and the foley catheter was removed. She was discharged home without recurrence of her symptoms over six-month follow-up. All three neonates were eventually discharged home and the patient was able to start breast feeding.

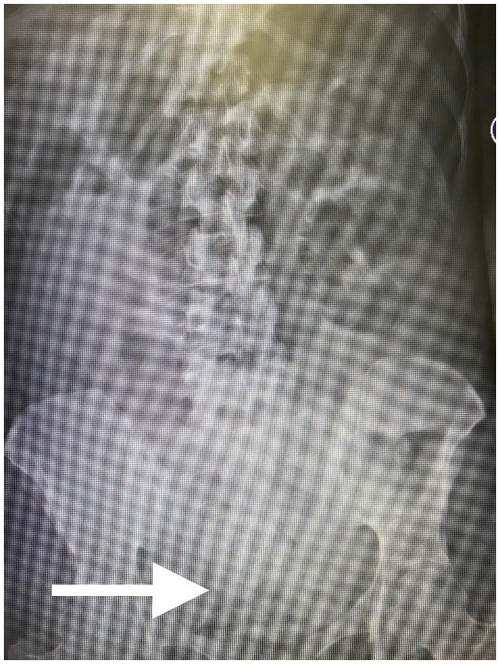

Fig. 1. X-ray of the abdomen showing mildly dilated air-filled small bowel loops in the left upper quadrant measuring up to 4 cm. There is residual oral contrast within the rectum.

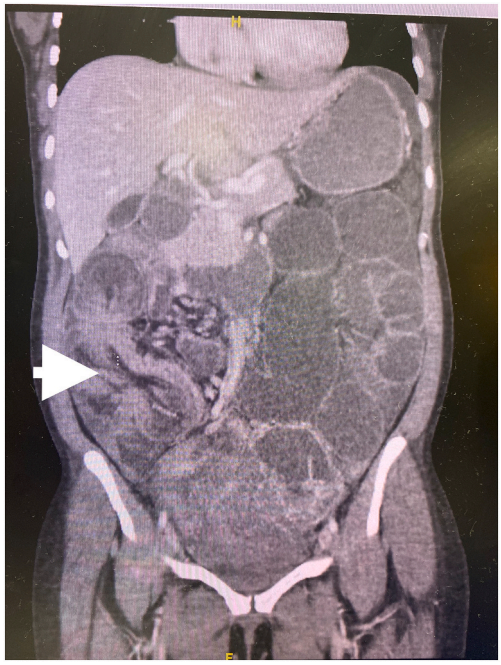

Fig. 2. Coronal slice CT scan of the abdomen showing abnormally distended fluid-filled small bowel loops to the level of the right mid-abdomen at which point there is evidence of intussusception and suggestion of volvulus.

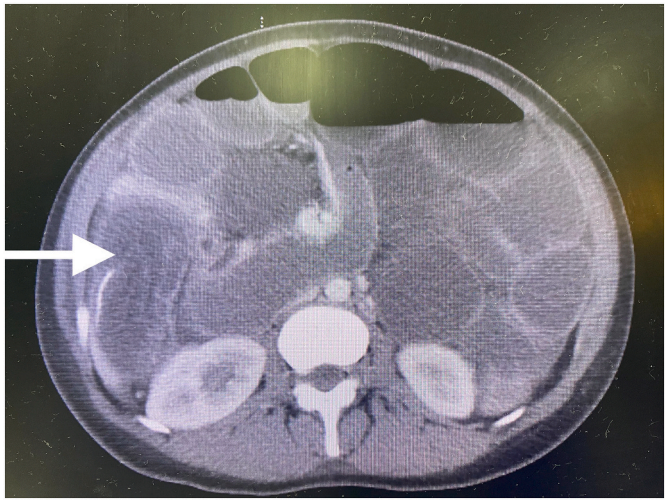

Fig. 3. Axial slice CT scan of the abdomen showing the intussusception which is at the level of small bowel anastomosis suture.

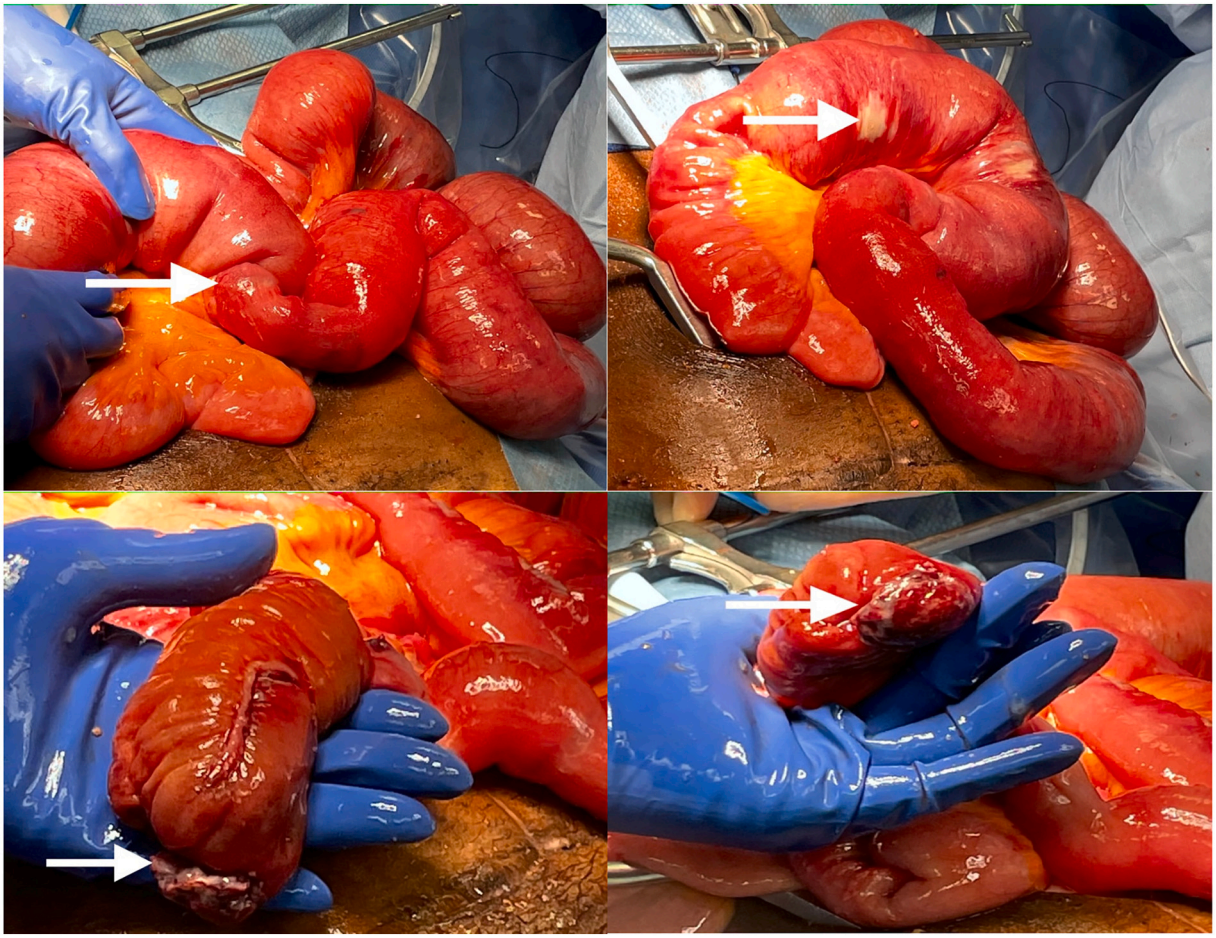

Fig. 4. Intraoperative photographs showing small bowel intussusception, ischemic patches appreciated on post-reduction. Anastomotic suture served as a lead point.

3. Discussion

The first known case of bowel intussusception was reported by Barbette of Amsterdam in 1674, and the first bowel intussusception operation was performed on a child by Sir Jonathon Hutchinson in 1871 [9]. Intussusception is a leading cause of bowel obstruction in the pediatric population, and it occurs primarily in children of 5 to 10 months of age [1]. Intussusception in adults accounts for less than 5% of all cases, or 2–3 cases per million a year [10].

The types of bowel intussusception are based on the origin of the lead point. There are four locations across the gastrointestinal tract where intussusceptions commonly occur, either near the fixed segments due to adhesions, or at the junction between freely moving segments [9]. These four different types of intussusception are ileocolic, ileocecal, enteric, and colocolonic [10].

The causes of intussusception are different in pediatric populations in comparison to adults. In children, the lead point of intussusception is usually benign, and a pneumatic reduction is sufficient to treat the patient in 80% of cases [9]. In adults, there are more instances of intussusception within the small bowel. The specific mechanism of intussusception in approximately 8%–20% of cases are unknown and are determined to be idiopathic or primary. The etiology of such pathology can include benign findings, idiopathic processes, and malignant lesions. Some associated conditions seen with adult intussusception include Meckel's diverticulum, colonic diverticulum, polyps, carcinomas, and benign or malignant lesions [9]. There are few reported cases of an anastomosis serving as the lead point for intussusception; rather, most commonly they occur in patients with Roux-en-Y gastric bypass or other types of circumferential anastomoses [5–8,11]. There is a single case report that describes intussusception that occurred because of a jejunorrhaphy for a jejunal perforation secondary to blunt abdominal trauma [4]. Some cases of rare causes of intussusception have been reported. Among those are "vanished colonic tumor with deposits in gland or ileal aberrant pancreas" [12,13]. After review of the relevant literature, this case is believed to be the first description of such a complication in the obstetric literature in which the bowel was transected during emergent triplet pregnancy delivery.

The exact mechanism of intussusception following a small bowel continuity reconstruction with stapled or hand-sewn anastomosis is not well understood. The working theory described by Reymond is based on a local inhomogeneity in the bowel wall created after repair [14]. The repair site disturbs the stable state of equilibrium that is essential for peristalsis and simultaneous wall contraction. If the simultaneous contraction is lost due to local tissue disturbance, the noncontracting part of the bowel may be pushed forward during peristalsis.

Treatment modalities for intussusception also differ between pediatric and adult populations. In children, the preferred treatment is hydrostatic reduction. In adults, the primary treatment is resection, since the lead point may harbor malignancy in up to 50% of cases [15]. In cases where the bowel intussusception is associated with a previously repaired suture or staple anastomosis, similar to the present case, the involved segment must be resected. It remains an open question what method of re-anastomosis is the optimal technique for the restoration of bowel continuity and reduce the risk of recurrence.

4. Conclusion

The possibility of a staple line causing intussusception should be

included in the differential diagnosis of mechanical small bowel obstruction after surgical resection, even though it is a rare complication. Adult intussusceptions are best managed by surgical resection.

Contributors

Allen Star contributed to drafting and editing the manuscript, and the literature review.

Valeria Ripa contributed to patient care, drafting and editing the manuscript, and the literature review.

Fariha Sheikh contributed to patient care, editing the manuscript, and the literature review.

Wei Wei Zhang contributed to patient care, editing the manuscript, and the literature review.

All authors approved the submitted manuscript.

Funding

The authors received no funding from any external sources for the publication of this case report.

Patient consent

Patient consent was obtained for the publication of the report and accompanying images.

Provenance and peer review

This article was not commissioned and was peer reviewed. Peer review was directed by Professor Margaret Rees, Editor in Chief, and Professor Nancy Philips, a *CRWH* editor and member of the same institution as the authors, was blinded to the process.

Conflict of interest statement

The authors declare that they have no conflict of interest regarding the publication of this case report.

References

[1] J. Potts, A. Al Samaraee, A. El-Hakeem, Small bowel intussusception in adults, Ann. R. Coll. Surg. Engl. 96 (1) (2014 Jan) 11–14, https://doi.org/10.1308/003588414X13824511650579.

[2] K.E. Applegate, Intussusception in children: evidence-based diagnosis and treatment, Pediatr. Radiol. 39 (Suppl. 2) (2009 Apr) S140–S143, https://doi.org/10.1007/s00247-009-1178-9.

[3] T. Azar, D.L. Berger, Adult intussusception, Ann. Surg. 226 (2) (1997 Aug) 134–138, https://doi.org/10.1097/00000658-199708000-00003.

[4] P.K. Lee, A. Masi, E.A. Warshowsky, V. Roudnitsky, Case report of an intussusception presenting after a trauma jejunorrhaphy, Ann. Med. Surg. (Lond.) (58) (2020 Aug 14) 1–3, https://doi.org/10.1016/j.amsu.2020.08.008.

[5] M.A. Rathore, S.I. Andrabi, Suture knot forming the apex of an adult ileo-ileal intussusception: a case report, Int. J. Surg. 5 (5) (2007 Oct) 297–299, https://doi.org/10.1016/j.ijsu.2006.12.004.

[6] A.S. Fahy, T.P. Nickerson, H.J. Schiller, Retrograde jejunogastric intussusception due to suture concretion, Ann. R. Coll. Surg. Engl. 98 (3) (2016 Mar) e45–e46, https://doi.org/10.1308/rcsann.2016.0084.

[7] K. Radhakrishna, P.C. Das, P.L. Rao, Retrograde intussusception: a lead-point for prograde intussusception, J. Pediatr. Surg. 29 (12) (1994 Dec) 1609–1610, https://doi.org/10.1016/0022-3468(94)90236-4.

[8] S. Madhavan, A. Augustine, Jejunojejunal intussusception: an unusual case of postoperative intestinal obstruction, Ann. R. Coll. Surg. Engl. 100 (7) (2018 Sep) e165–e167, https://doi.org/10.1308/rcsann.2018.0079.

[9] A. Marinis, A. Yiallourou, L. Samanides, N. Dafnios, G. Anastasopoulos, I. Vassiliou, T. Theodosopoulos, Intussusception of the bowel in adults: a review, World J. Gastroenterol. 15 (4) (2009 Jan 28) 407–411, https://doi.org/10.3748/wjg.15.407.

[10] F. Panzera, B. Di Venere, M. Rizzi, A. Biscaglia, C.A. Praticò, G. Nasti, A. Mardighian, T.F. Nunes, R. Inchingolo, Bowel intussusception in adult: prevalence, diagnostic tools and therapy, World J. Methodol. 11 (3) (2021 May 20) 81–87, https://doi.org/10.5662/wjm.v11.i3.81.

[11] L. Elms, R.C. Moon, S. Varnadore, A.F. Teixeira, M.A. Jawad, Causes of small bowel obstruction after Roux-en-Y gastric bypass: a review of 2,395 cases at a single institution, Surg. Endosc. 28 (5) (2014 May) 1624–1628, https://doi.org/10.1007/s00464-013-3361-1.

[12] Y. Fujino, Y. Fujio, E. Shimada, A. Okazaki, Intussusception due to vanishing colon cancer with metastasis of the regional lymph nodes: report of a case, Surg. Today 30 (2) (2000) 188–190, https://doi.org/10.1007/s005950070133.

[13] W.S. Huang, C.H. Kuo, C.S. Changchien, K.L. Hsu, C.C. Lin, Ileal aberrant pancreas induces intussusception and gastrointestinal bleeding in an adult woman - case report, Eur. J. Gastroenterol. Hepatol. 11 (10) (1999 Oct) 1175–1177, https://doi.org/10.1097/00042737-199910000-00017.

[14] R.D. Reymond, The mechanism of intussusception: a theoretical analysis of the phenomenon, Br. J. Radiol. 45 (529) (1972 Jan) 1–7, https://doi.org/10.1259/0007-1285-45-529-1.

[15] O.A. Varban, A. Ardestani, D.E. Azagury, B. Kis, D.C. Brooks, A. Tavakkoli, Contemporary management of adult intussusception: who needs a resection? World J. Surg. 37 (8) (2013 Aug) 1872–1877, https://doi.org/10.1007/s00268-013-2036-3.