

A case report of a pregnancy complicated by sigmoid volvulus in the extreme preterm gestational age

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Conclusion and results

The patient was transferred to the ICU for close observation. Her vital signs were within normal range. She received serum therapy, antibiotics, heparin and one pack cell transfusion due to a drop in hemoglobin level from 11.8 to 9.4. The fetus was assessed to be normal by frequent ultra-sonographies and fetal heart rate monitoring. Post-operatively, the patient experienced dyspnea and metabolic acidosis. She underwent echocardiography and cardiac workup by which the pulmonary thromboembolysis was ruled out. After respiratory physiotherapy and incentive spirometry, the dyspnea resolved. The patient and her fetus were otherwise well; she was discharged after 6 days with left colostomy and drainage tubes in her abdomen. Her further weekly follow/up showed normal condition of both mother and her fetus.

Discussion

As rare as it is, bowel obstruction can complicate a normal pregnancy. The most common etiologies for bowel obstruction are adhesions from previous abdominal surgeries that accounts for 60-70% of cases, followed by volvulus (25%) and intussusception (5%). Adhesive bonds develop more commonly after open surgeries than laparoscopic surgeries as in our case who underwent two cesarean sections (9). Volvulus, the second most common etiology, is a closed-loop bowel obstruction which develops when a bowel loop twists around the axis of its own mesentery more than 180 degrees. (10). This phenomenon usually occurs in the second and third trimesters of pregnancy if ever. Several factors presumably play role in this anatomical abnormality; First, an enlarging uterus changes the anatomical location of bowel and colon. Second, the elevated level of progesterone and the release of relaxin during pregnancy makes the tissues more motile which may lead to volvulus in a susceptible woman with congenital mal-rotation or adhesions (11, 12). Age and multi-gravidity are not reported as significant factors (4). The prognosis is highly dependent on timely diagnosis and intervention. Clinical suspicion is warranted to avoid deferring diagnostic procedures and mistaking the diagnosis with other obstetric complications. According to a systematic review published in 2014, common presenting symptoms of bowel obstruction in pregnancy include; abdominal pain (88%) and vomiting (67%), and clinical findings such as tenderness (49%) and distension (28%). However, laboratory findings are usually normal (13, 14). The classic triad of generalized abdominal pain, vomiting, and obstipation should raise the clinical suspicion for mid-gut volvulus. The abdominal pain of volvulus usually transitions from colicky to constant in late stages of pregnancy and is mostly felt in the epigastrium (11). Moreover, new onset back pain can occur due to an abdominal pathology during gestation (15). As a matter of fact, the average time between the onset of symptoms until presentation of abdominal obstruction is about 48 hours, since abdominal pain, nausea, and leukocytosis can occur in a normal pregnancy and cloud the clinical picture (6, 16). According to literature review, almost all maternal deaths occur when patients seek medical intervention after 48 hours following onset of symptoms. maternal mortality in cases with viable bowel was 5% comparing

to more than 50% in cases with bowel perforation, highlighting the importance of timely management (17). One recent review study that assessed literature on mid-gut volvulus during pregnancy has reported that overall mortality rate of mother and fetus was 13% and 35%, respectively and that maternal mortality all occurred in the third trimester (18). The hesitation to perform a radiological procedure on mother is the first barrier in quick diagnosis. As available as it is, abdominal x-ray fails to show the exact location of obstruction. Abdominal CT scan with contrast is another available method that is usually kept for essential conditions during pregnancy. This type of radiography, however, exposes the fetus to less than 50 mGy that does not increase the risk of developing malformations, developmental delay, tumors, or genetic mutations to a significant amount. Nevertheless, transient hypothyroidism in a neonate who was exposed to contrast at 35-week gestation has been reported. Hence, guidelines recommend monitoring of thyroid function in the newborn in this setting (3, 19). Guidelines has warned about the cumulative radiation dose to the fetus during pregnancy to be less than 5–10 rads. generally, there is no single diagnostic procedure that exceeds 5 rads in total. The radiation dose of an abdominal radiograph is around 0.1–0.3 rads, while an abdominal and pelvic CT scan reaches up to 5 rads of fetal exposure. The most sensitive time for radiation exposure is the first week of gestation which associates with the highest rates of fetal mortality, followed by the period between 10th and 17th weeks of gestation, when radiation may cause central nervous system teratogenesis. After that, the risk of childhood hematologic malignancy becomes the most important concern (20, 21). Having said that, mother’s health should always be the priority, since early diagnosis and intervention, yields better outcome than avoiding the radiation exposure in this context (16). The type of intervention and the decision to cease the pregnancy is dependent on the gestational age, clinical scenario and the viability of the fetus. In the 1st trimester, the possibility of miscarriage should be explained to the mother before performing an endoscopic reduction or surgical resection. In the 2nd trimester, determining the best method of intervention is sometimes difficult, considering the fact that the mother’s life is the priority, and the patient must be informed of probable delivery in the operation room. In the 3rd trimester, however, a cesarean section before bowel repair is usually the optimum intervention especially when the fetus is mature. There is no reason to end the pregnancy if the bowel is repaired, and if the mother is clinically capable of continuing the gestation (2, 5, 16). Sigmoidectomy is the choice intervention in the acute setting when the colon appears to be nonviable or perforated (17). When the bowel is evidently infarcted, the necrotic section must be resected and an anastomosis should be performed either in a one-stage or a two-stage procedure, depending on the patient’s physiology. Importantly, extensive surgical resection might have complications like short gut syndrome, which mandates life-long total parenteral nutrition for the patient (22). Detorsion of the volvulus by colonoscopy and decompression of bowel by placement of a soft rectal tube may be sufficient when there is no evidence of infarction or acute abdomen mainly in the first trimester. Noteworthy to say, performing colonoscopic detorsion in late pregnancy is rarely successful (23). Management of bowel obstruction in pregnancy necessitates a multidisciplinary intervention and prompt clinical decision making. The hesitation to perform radiological procedures defers timely management and should be avoided. patient should undergo the safest available diagnostic procedure (either CT or MRI) and shall be managed accordingly as soon as possible. The lack of MRI in our center was one limitation of this study, however as mother’s life was the priority, the patient underwent a contrast-enhanced CT scan and emergently was managed surgically. The outcome of the patient and her fetus in our study was promising; however, longer follow-up is necessary to draw a definite conclusion about the management of this patient.

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Conflicts of Interest

The authors declare no conflict of interest regarding the publication of this article.

Consent

All participants in this study were informed about the process of writing and consented to the publication. Written Informed consent has been obtained.

Authors contribution

Naghmeh kian: manuscript writing and data collection Atefeh Moridi: data collection and manuscript revision

References

1. Lord SA, Boswell WC. Sigmoid volvulus in pregnancy. *American Surgeon*. 1996;62(5):2.
2. Aftab Z, Toro A, Abdelaal A, Dasovsky M, Gehani S, Abdel Mola A, et al. Endoscopic reduction of a volvulus of the sigmoid colon in pregnancy: case report and a comprehensive review of the literature. *World Journal of Emergency Surgery*. 2014;9:1-6.
3. Watanabe T, Kinjo T, Kinjyo Y, Nitta H, Masamoto H, Mekar K, et al. Sigmoid volvulus in pregnancy assessed by contrast-enhanced computed tomography scanning. *Case Reports in Obstetrics and Gynecology*. 2021;2021:1-4.
4. HARER JR WB, HARER SR WB. Volvulus complicating pregnancy and puerperium: report of three cases and review of literature. *Obstetrics & Gynecology*. 1958;12(4):399-406.
5. Al Maksoud AM, Barsoum AK, Moneer MM. Sigmoid volvulus during pregnancy: a rare non-obstetric complication. Report of a case and review of the literature. *International journal of surgery case reports*. 2015;17:61-4.
6. Perdue PW, Johnson Jr HW, Stafford PW. Intestinal obstruction complicating pregnancy. *The American Journal of Surgery*. 1992;164(4):384-8.
7. Tesnière M, Arnoult A, Roger N. Sigmoid volvulus in pregnancy. *Journal of Emergency Medicine*. 2018;54(6):e129-e31.
8. Obstetricians ACo, Gynecologists. Committee Opinion No. 723: guidelines for diagnostic imaging during pregnancy and lactation. *Obstetrics & Gynecology*. 2017;130(4):e210-e6.
9. Gashoot K, Kashbour MO, Abuhlaiga M. Midgut Volvulus in Disguise: Acute Abdomen in Early Pregnancy. *Cureus*. 2023;15(12):.
10. Mamatha C, Dhanalakshmi M, Rajeswari K. A successful management of ileal volvulus in pregnancy. *Indian J Obstet Gynecol Res*. 2019;15:108-9.
11. Cong Q, Li X, Ye X, Sun L, Jiang W, Han Z, et al. Small bowel volvulus in mid and late pregnancy: can early diagnosis be established to avoid catastrophic outcomes? *International Journal of Clinical and Experimental Medicine*. 2014;7(11):4538.
12. Bajaj M, Gillespie C, Dale J. Recurrent sigmoid volvulus in pregnancy. *ANZ Journal of Surgery*. 2017;87(11):.
13. Sagi Y, Bussiere-Cote S, Meier K, Bischoff D, D'Souza R. Small bowel obstruction in pregnancy: a systematic review [32F]. *Obstetrics & Gynecology*. 2018;131:72S.
14. Robertson R, Wu L. Adhesive small bowel obstruction in pregnancy and the use of oral contrast media: a case report. *Journal of Surgical Case Reports*. 2020;2020(3):rjaa018.
15. Ventura-Braswell AM, Satin AJ, Higby K. Delayed diagnosis of bowel infarction secondary to maternal midgut volvulus at term. *Obstetrics & Gynecology*. 1998;91(5 Part 2):808-10.
16. Khan MR, Ur Rehman S. Sigmoid volvulus in pregnancy and puerperium: a surgical and obstetric catastrophe. Report of a case and review of the world literature. *World Journal of Emergency Surgery*. 2012;7:1-5.
17. Alrahmani L, Rivington J, Rose CH. Recurrent volvulus during pregnancy: case report and review of the literature. *Case Reports in Obstetrics and Gynecology*. 2018;2018:.
18. Chong E, Liu DS, Strugnell N, Rajagopal V, Mori KK. Midgut Volvulus: A Rare but Fatal Cause of Abdominal Pain in Pregnancy—How Can We Diagnose and Prevent Mortality? *Obstetrics and Gynecology International*. 2020;2020:.
19. Jain C. ACOG Committee Opinion No. 723: guidelines for diagnostic imaging during pregnancy and lactation. *Obstetrics & Gynecology*. 2019;133(1):186.
20. Karam PA. Determining and Reporting Fetal Radiation Exposure from Diagnostic Radiation. *Health physics*. 2000;79:S85-S90.
21. Chen MM, Coakley FV, Kaimal A, Laros Jr RK. Guidelines for computed tomography and magnetic resonance imaging use during pregnancy and lactation. *Obstetrics & Gynecology*. 2008;112(2 Part 1):333-40.
22. J. Kusnetzoff AB, C. Casalnuovo, LM Alvarez, D. Massive midgut volvulus during pregnancy. *Journal of Obstetrics and Gynaecology*. 1997;17(6):583-.
23. Machado NO, Machado LS. Sigmoid volvulus complicating pregnancy managed by resection and primary anastomosis: case report with literature review. *Sultan Qaboos University Medical Journal*. 2009;9(1):84.





figure 1.B (coronal view) shows the gravid uterus in proximity to dilated loops of colon and a transition point in which contrast is compacted.

1.C



figure 1.C shows an abdominal radiograph with the classic coffee-bean sign

Figure 2



Figure 2 demonstrates the dilated loop of sigmoid colon which were found next to the gravid uterus and match the clinical and radiologic findings of sigmoid volvulus.

Figure 3



Figure 3 shows patchy areas of purple-appearing colon which is consistent with tissue ischemia due to the process of the loop being rotated around its own axis. The infarcted section was resected with Hartman procedure









