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Case report

Ileosigmoid knot in pregnancy, incidentally discovered during caesarean section. A rare case report

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ABSTRACT

Introduction and importance: The occurrence of intestinal obstruction during pregnancy is an unusual condition. Ileosigmoid knot is even rarer but it is associated with a poor prognosis.
Case presentation: We report a case of ileosigmoid knot in a 22-year-old patient who admitted to our department with third-trimester metrorrhagia in 36-week pregnancy. Ileosigmoid knot was incidentally discovered during a caesarean section indicated for retroplacental hematoma. Intraoperatively, necrosis of the ileum and the sigmoid colon was noted. After extraction of a healthy living male newborn, we performed resection of 30 cm of involved small bowel as well as resection of the necrotic sigmoid colon. We proceeded to do primary ileal anastomosis and a Hartmann's colostomy. The patient had a closure of colostomy after 30 days from the day of discharge, according to our department's protocol. The outcome was uneventful, with return to daily activities and a good maternal and perinatal prognosis.
Discussion: Through the analysis of this case report, we discuss the etiopathogenic, diagnostic, therapeutic and prognosis aspects of ileosigmoid knot in pregnancy.
Conclusion: Ileosigmoid knot in pregnancy is a life threatening condition needing multidisciplinary management. It may be associated with other obstetric emergencies such as retroplacental hematoma, which is a diagnostic pitfall. The diagnosis is often an incidentally discovery as evidenced by this case report.

1. Introduction

Ileosigmoid knot is defined as the wrapping of the ileum around the base of the sigmoid colon, or vice versa, forming a knot [1]. The main documented risk factors are: history of abdominal or pelvic surgery and pelvic inflammatory disease through the formation of adhesions or bands. Long mesentery of small bowel, freely mobile small bowel, long sigmoid colon on a narrow pedicle and, ingestion of a high bulk diet in the presence of an empty small bowel are also believed to predispose to ileosigmoid knot. Late pregnancy is also known as possible predisposing factor [2,3]. The occurrence of intestinal obstruction in pregnancy is an unusual condition. Ileosigmoid knot in pregnancy is even rarer. Only 15 cases have been reported in the literature from 1967 to date [2,4] (Table 1). This condition frequently leads to significant maternal and fetal mortality due to a delay in diagnosis and treatment, the rapid progression of the disease resulting in bowels ischemia, hemodynamic instability and septic shock [1,2,5–8]. Indeed, clinical signs are nonspecific during pregnancy and practitioners are reluctant to prescribe radiological examinations deemed necessary for preoperative diagnosis [1,5,8]. This medical and surgical emergency required early and multidisciplinary management. The approach to obstetrics and surgical treatment is dependent on gestational age at diagnosis. It may include maternal resuscitation, obstetric measures and surgery to remove the obstruction.

However, surgery must proceed urgently, with gestational age guiding the obstetric component. Here we report a rare case of ileosigmoid knot occurring at 36 weeks pregnancy in a 22-year-old patient treated in our department. The aim was to discuss the etiopathogenic, diagnostic, therapeutic and prognosis aspects of this pathology during pregnancy in a resource-limited center through this case report.

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This case report adheres to the SCARE 2025 guidelines for reporting surgical case reports [9].

2. Case presentation

A 22-year-old black African woman, gravida 2, para 2, with no significant past medical or surgical histories was referred to our department for the management of third-trimester metrorrhagia in a 36-week pregnancy. This was associated with intense abdominal pain which is not relieved by any analgesics, and absolute constipation. On physical examination she was anxious but had normal vital signs except the pulse rate, (105 bpm). The body temperature was at 37.5 °C, blood pressure at 110/60 mmHg. Abdominal evaluation showed a term sized gravid uterus with uterine hypertonia. Her abdomen was distended with marked generalized tenderness, guarding, and absent bowel sounds. Fetal heart rate was 156 bpm. Vaginal examination showed that the cervix was closed but there was metrorrhagia consisting of black blood mixed with clots. Laboratory investigations showed a white blood cell count of 7850/mm3 (4–11), hemoglobin level of 10 g/dl(11–16), platelets count of 120,000/mm3 (100–350). Liver and renal panel were normal. The search for disseminated intravascular coagulation returned normal findings. This clinical symptom makes it possible to evoke differential diagnoses such as: retroplacental haematoma, placenta previa, uterine rupture, intestinal obstruction in pregnancy, acute appendicitis, and cholecystitis in pregnancy. An emergency abdominal ultrasound scan had confirmed a live intrauterine pregnancy, estimated to be at 36 weeks and 3 days of gestation. Ultrasound also showed placental lacunae suggesting retroplacental hematoma. A diagnosis of a retroplacental hematoma stage II of SHER classification was done. The patient was taken for an emergency caesarean section under spinal anesthesia with Joel Cohen incision. This resulted in delivery of a living male baby with Apgar score of 4–6, and weight of 2.7 kg. A retroplacental hematoma weighing 150 g was noted. After performing hysterorraphy, exploration of the abdominal cavity revealed sigmoid volvulus (Fig. 1) which required the intervention of general surgeon. Thus, spinal anesthesia was converted to general anesthesia, and we extended the incision through a midline incision starting from the transverse incision to the sternum, make an inverted T-shaped incision. Careful exploration revealed necrotics loops of both small bowel and the sigmoid colon. The small bowel was twisted at the base of a mega-dolichosigmoid colon

Table 1
Summary of data of patients with ileosigmoid knot in pregnancy from year 1967 to 2025.

No.	Authors	Age (years)	Pregnancy period	Presentation	Preoperative diagnosis of ISK	Bowel involvement	Operation	Mortality/ morbidity
1	Atamanalp et al. [21]	31	16W	Abdominal pain, Abdominal distension	No	Sigmoid colon	Sigmoid resection	None
2	Atamanalp et al. [21]	35	27W	Abdominal pain, vomiting	No	Ileum/ sigmoid colon	Ileum and sigmoid resection, ileal anastomosis, Hartmann's colostomy	Preterm delivery
3	Atamanalp et al. [21]	38	27W	Abdominal pain, vomiting	No	Ileum/ sigmoid colon	Ileum and sigmoid resection, ileal anastomosis, Hartmann's colostomy	Died of sepsis
4	Ucar et al. [22]	28	PPD1	Abdominal distension, and hypotension	No	Ileum	Ileal resection	Died of abdominal compartment syndrome
5	Vaez-Zadeh et al. [23]	30	Not provided	Abdominal pain, vomiting	No	Ileum/ sigmoid colon	Ileum and sigmoid resection, ileal anastomosis, Hartmann's colostomy	Died of sepsis during operation
6	Vaez-Zadeh et al. [23]	18	Not provided	Abdominal pain, vomiting	No	Ileum/ sigmoid colon	Ileum and sigmoid resection, ileal anastomosis, Hartmann's colostomy	Died of abdominal wound dehiscence
7	Shimizu et al. [24]	28	13W	Abdominal pain, Abdominal distension	Yes	Ileum/ sigmoid colon	Ileum and sigmoid resection, ileal anastomosis, Hartmann's colostomy	None
8	Toktaş et al. [28]	41	28W	Chronic constipation, abdominal pain, Abdominal distension, and vomiting	No	Ileum/ sigmoid colon	Ileum and sigmoid resection, ileal anastomosis, sigmoid anastomosis	-Ileal anastomotic leak at POD3 -Fetal death
9	Atamanalp et al. [14]	35	27W	Constipation, abdominal pain, Abdominal distension	No	Ileum/ sigmoid colon	Ileum and sigmoid resection, ileal anastomosis, Hartmann's colostomy	- Preterm delivery at POD1 - Adhesive ileus at POD9
10	Atamanalp et al. [14]	38	27W	Constipation, abdominal pain, Abdominal distension	No	Ileum/ sigmoid colon	Ileum and sigmoid resection, ileal anastomosis, Hartmann's colostomy	Died of septic shock at POD1
11	Atamanalp et al. [14]	31	16W	Constipation, abdominal pain, Abdominal distension	No	Sigmoid colon	Sigmoid resection, sigmoid anastomosis	None
12	Abebe et al. [29]	38	During labor	Persistent abdominal pain and tachycardia	No	Ileum	Ileum resection, ileal anastomosis	None
13	Anajjar et al. [2]	23	12W	Abdominal pain, abdominal distension with non-passage of flatus or stools, and hypotension	Yes	Ileum	- Ileum resection and ileostomy - deferred prophylactic sigmoidectomy (mega-dolichosigmoid colon)	Abortion
14	Maunganidze et al. [4]	20	13W	Abdominal pain, abdominal distension vomiting and constipation	No	Ileum/ sigmoid colon	Ileum and sigmoid resection, ileal anastomosis, Hartmann's colostomy	Abortion
15	Boukhalit et al. [8]	25	PPD6	Abdominal pain, abdominal distension	Yes	Ileum	Ileum resection and ileostomy	None
16	Our case	22	36W	Chronic constipation, abdominal pain, and metrorrhagia	No	Ileum/ sigmoid colon	Ileum and sigmoid resection, ileal anastomosis, Hartmann's colostomy	None

PPD: Postpartum day, POD: Post-operative day.

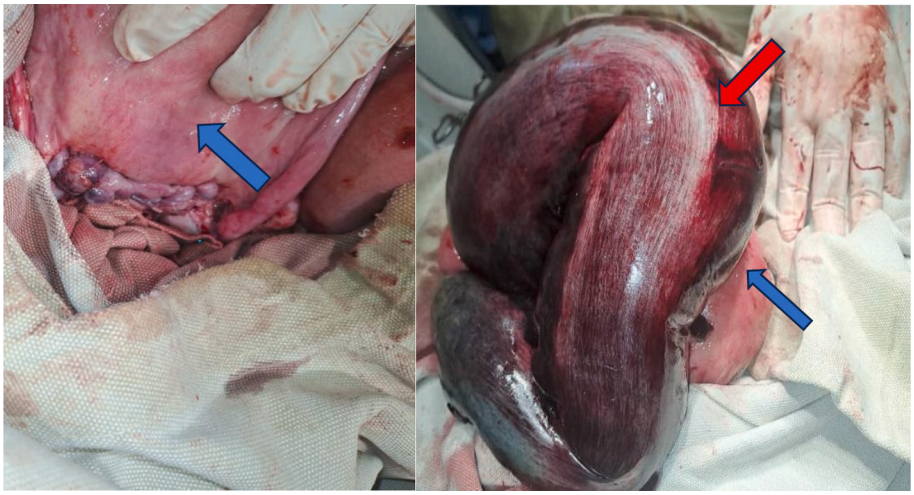

Fig. 1. Intra-operative picture of ileosigmoid knot in pregnancy. Uterus after hysterorrhaphy (blue arrow), volvulus of the sigmoid colon (red arrow).

(Fig. 2). The necrotic area was located in the Suddeck, an area which experienced a limited blood supply. The necrotic areas were completely devascularized. Elsewhere, the examination was normal, including the appendix. Resection of 30 cm of involved small bowel as well as resection of the necrotic sigmoid colon was done (Fig. 3). We proceeded to do primary ileal anastomosis and a Hartmann's colostomy. We have decided against performing an appendectomy on the patient. The postoperative course was uneventful. A macroscopic examination of the surgical specimens revealed no intraluminal mass. Post operatively the patient was managed with intravenous fluids (saline serum 2 L/24 h, Ringer lactate serum 1 L/24 h), transfusion (two units of packed red blood cells), antibiotics (ceftriaxone 2 g/24 h and metronidazole infusion 500 mg/8 h), and analgesia (paracetamol 1 g/8 h).

Due to a lack of financial resources, histological examination of the surgical specimens was not performed. For the same reason, testing for chronic colitis due to autoimmunity induced during pregnancy was also not performed.

The outcome was uneventful, and the patient was discharged home on day 14 post operatively with no complications. She had a closure of colostomy after 30 days from the day of discharge. The patient was satisfied with the care and resumed her daily activities. Six months after her surgery both mother and baby were in good health.

3. Discussion

This report outlines a case of ileosigmoid knot occurring during pregnancy in a young patient with no prior medical or surgical histories. This case report is distinct from others in the literature because it describes the occurrence of ileosigmoid knot in conjunction with another obstetric emergency (retroplacental hematoma). This combination is a diagnostic pitfall. In this case report, the patient's abdominal pain and uterine hypertonia were all erroneously attributed to a retroplacental hematoma, which resulted in a delayed diagnosis of ileosigmoid knot. Indeed, in such cases, it is not typical for the obstetrician to consider other non-obstetric causes.

Intestinal obstruction is a rare complication in pregnancy, with an incidence of 1/1500 to 1/3000 pregnancies [10]. It is estimated that 53–59 % of intestinal obstructions are caused by adhesions or bands, which are often the result of previous surgical procedures or instances of pelvic inflammatory disease [11]. Intestinal volvulus is even rarer, accounting for only 25 % of these etiologies [12]. The ileosigmoid knot represents the rarest type of intestinal volvulus. It occurs in 7.6 % of all sigmoid volvuluses [5]. It was first described by Parker in 1845 [1]. Since, few cases have been reported in pregnancy [2–4,6,7,13,14]. In the literature, only 15 cases of ileosigmoid knot in pregnancy have been reported from 1967 to date (Table 1). The literature identifies the following contributing factors: chronic constipation, sigmoid mega dolichocolon, pregnancy, intestinal malrotation, Hirschsprung's disease, abdominal adhesions, neuropsychiatric diseases (e.g. Parkinson's disease, multiple sclerosis, etc.) and a high-fibre diet [1,5,8,15]. Our patient exhibited the following risk factors: chronic constipation, sigmoid mega-dolichocolon and pregnancy. Furthermore, ileosigmoid knots can occur in pregnant women without any prior medical or surgical history [2,7].

At the level of the pathogenesis of the disease, physiological changes that occur during pregnancy can also promote occlusion. Therefore, the decline in intestinal peristalsis and the rise in habitual constipation caused by progestin impregnation lead to intestinal smooth muscle hypotonia [16,17]. The second or third trimester of pregnancy and the postpartum period are the times when intestinal obstruction is most likely to occur [12]. In the case of our patient, the diagnosis was made at 36 weeks gestation. It is important to note that three critical periods have been identified during pregnancy. Firstly, from 16 to 20 weeks, the uterus moves upwards from the pelvis towards the abdomen. Secondly, from 32 to 36 weeks, the fetal head descends into the pelvis. Thirdly, in the immediate postpartum period, the uterus suddenly reduces in size [18].

In 1993, Alver et al. [5] classified ileosigmoid knot into three types, based on mechanism of formation of knot. In Type I (commonest), ileum is the active component, wrapping itself around the sigmoid colon (passive component) to form the knot in clockwise or anti-clockwise direction. In Type II, sigmoid colon (active component) wraps itself around a loop of ileum (passive component) in clockwise and anti-clockwise direction. In Type III, ileocaecal segment (active component) wraps itself around the sigmoid colon (passive component). Types I and II have been classified into A and B, depending on whether knot was clockwise or anticlockwise [2]. In this case report it was a type I ileosigmoid knot.

Regarding diagnosis, the diagnosis of ileosigmoid knot in pregnancy is often delayed because the disease is rare, the usual signs of occlusion (pain, distension, vomiting, constipation) are attributed to pregnancy, and diagnostic radiographic studies are generally avoided [14]. Indeed, displacement of abdominal organs as the pregnancy progresses can result in atypical locations for pain [6]. In this particular case report, symptoms were characterised by abdominal distension and intense abdominopelvic pain, occurring in conjunction with uterine hypertonia and metrorrhagia. These signs were erroneously attributed to retroplacental haematoma.

In this case report, the diagnosis of ileosigmoid knot was made late in the process. It was incidentally identified during a caesarean section.

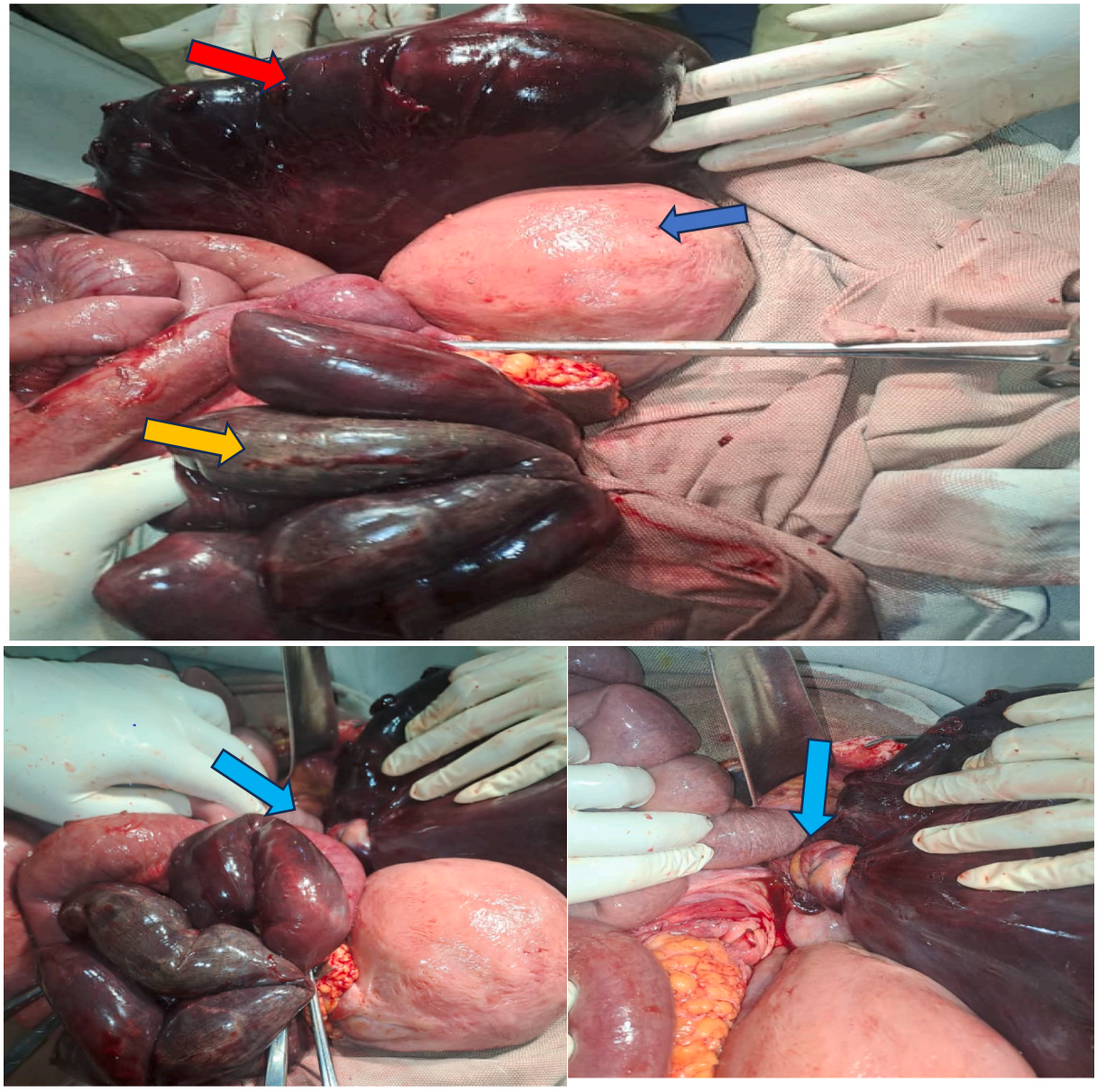

Fig. 2. Intraoperative pictures of ileosigmoid knot in pregnancy: Uterus after hysterorrhaphy (blue arrow), volvulus and necrosis of the sigmoid colon (red arrow), ileum twisted at the base of the sigmoid colon (yellow arrow), ileosigmoid knot (green arrow).

The absence of suspicion regarding ileosigmoid knot preoperatively resulted in a delay in diagnosis and an extended operating time, as our hospital does not have a surgeon available. We therefore had to wait for a surgical team to arrive from another hospital located 10 km away. In addition to the operation's duration, the aesthetic damage is notable for a 22-year-old woman, as it involved converting a transverse incision into a substantial inverted "T" incision.

The first step in the diagnostic process is to suspect intestinal obstruction in the context of non-specific signs that occur during pregnancy or in the postpartum. The second step is to perform an appropriate radiological examination. Abdominal ultrasonography may give some information about the fetus in addition to ruling out other pathologies [14]. Ultrasonography is an effective diagnostic tool that is capable of excluding the diagnostic of intestinal obstruction with 89 % sensitivity and 100 % specificity. Its safety allows for repeated examinations to be carried out, making it possible to monitor the progress of dilation of intestinal loops [6,17–20].

Plain abdominal X-ray radiography may facilitate diagnosis by demonstrating a dilated sigmoid colon with multiple small bowel air fluid levels [2,5,14]. Abdominal magnetic resonance imaging (MRI), and computerized tomography (CT): can reveal the findings of a sigmoid volvulus including the characteristic whirl sign created by the twisted intestine and mesocolon. CT can also reveal signs of bowel ischemia caused by strangulation such as pneumatosis [2]. MRI and CT were not available in our setting.

Most often, accurate preoperative diagnosis of ileosigmoid knot in pregnancy is difficult, and pregnant patients are usually diagnosed with a nonspecific intestinal obstruction, and often it was an incidentally discovered as was the case in this case report [4,14,21–23]. Some rare cases of preoperative diagnosis of ileosigmoid knot in pregnancy have been reported [2,8,24].

With regard to treatment, a multidisciplinary approach is essential, involving obstetricians, surgeons, anesthesiologists and radiologists. The principle of management depends on the gestational age at the time of diagnosis [2,6,17]. However, emergency surgery must not be delayed in the presence of suspected strangulating obstruction. Maternal

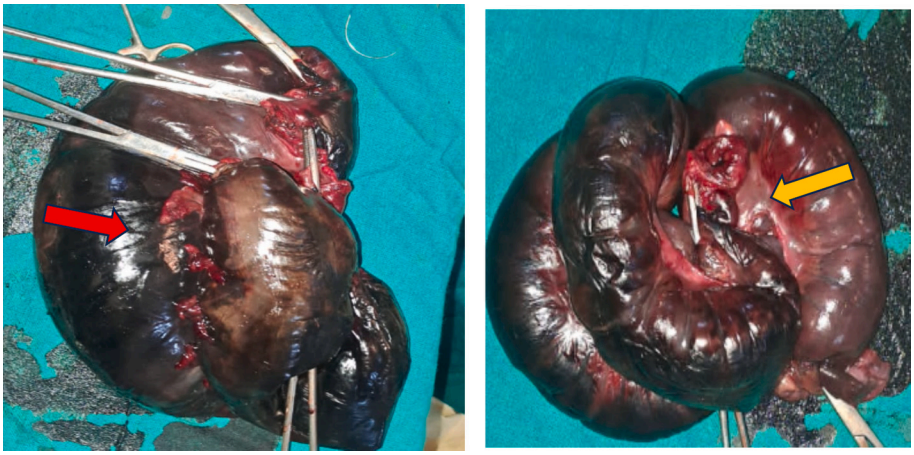

Fig. 3. Post-operative pictures of ileosigmoid knot in pregnancy: Resection of 30 cm of involved ileum (green arrow), resection of the necrotic sigmoid colon (red arrow).

survival is the top priority. Surgery must proceed urgently, with gestational age guiding only the obstetric component. Therefore, the recommended course of action is to perform a laparotomy or an endoscopic approach before the 26-week gestational age. The pregnancy is then continued until term. Corticosteroid therapy is administered between 26 and 34 weeks of gestation to promote accelerated fetal lung maturation, prior to the caesarean section. The surgical treatment for the occlusion is performed during a caesarean section, following hysterorrhaphy. It has been determined that corticosteroid therapy to accelerate fetal lung maturation is not necessary after 34 weeks of pregnancy. A caesarean section is performed with a midline skin incision, which allows for the treatment of the occlusion during the same operative time. In all cases, surgical intervention should be performed within 72 h to avoid major complications, such as necrosis, perforation, or septic shock, as demonstrated in this case report, where the diagnosis was delayed and made at the stage of intestinal necrosis [17,25].

The surgical procedure for sigmoid volvulus depends on the presence or absence of severity criteria. In the absence of severity criteria, the recommended treatment is endoscopic detorsion of the volvulus [15]. In rare cases where there is no intestinal necrosis, sigmoidopexy is also recommended [26]. In cases where severity criteria or complications are present, surgical intervention by laparotomy is the preferred treatment option. Surgical removal of the necrotic or questionable intestinal segment is required. This procedure consists of colectomy or sigmoidectomy, followed, or not, by intestinal anastomosis, depending on the local conditions [15,27]. In this case report, we performed ileal and sigmoid colon resection followed by primary ileal anastomosis and Hartman's colostomy.

The colostomy was closed one month later in accordance with the protocol of our department. Indeed, in our department, digestive stomas are closed between 21 and 30 days post-operatively, provided there are no complications. As shown in the literature, this surgical procedure was the most frequently reported [4,14,21,23,24].

With regard to the prognosis, ileosigmoid knot in pregnancy is associated with a poor prognosis, with a high rate of fetal and maternal mortality and morbidity. As shown in the data from the literature, in 15 cases published from 1967 to date, five cases (33.3 %) resulted in maternal death [14,21–23]. Two cases (13.3 %) were complicated by abortion [2,4]. Two cases (13.3 %) of preterm deliveries [14,21] and one case (6.6 %) of fetal death [28] were noted. In our case, the ileosigmoid knot resulted in favourable maternal and foetal prognoses.

Table 1 presents a summary of data on patients with ileosigmoid knot in pregnancy from 1967 to 2025.

Study strengths and limitations: This is the first case of ileosigmoid knot during pregnancy to be documented in our setting. However, the study has certain limitations, including the absence of preoperative radiological exploration and the lack of resources for histological examination of the surgical specimens. Histology is a valuable tool in the diagnostic process, whether used to investigate an asymptomatic intestinal tumour or to diagnose chronic colitis.

3.1. Learning points

- It is important to note that ileosigmoid knots in pregnancy may be associated with retroplacental haematomas. This can constitute a diagnostic pitfall.
- In cases of uterine hypertonia and abdominal pain in pregnant women, practitioners should consider the possibility of intestinal obstruction, which could be associated with another obstetric emergency.
- In situations where resources are limited, abdominal ultrasound and exploratory laparotomy are essential for diagnosing ileosigmoid knots in pregnant women.
- In the context of suspected ileosigmoid knot in pregnancy, emergency surgery should not be delayed; gestational age guiding only the obstetric component. Indeed, the primary objective is to ensure maternal survival.

4. Conclusion

The occurrence of ileosigmoid knot during pregnancy is exceptional in our clinical practice. The diagnosis of this condition is challenging and often delayed due to its rarity and the absence of specific clinical signs in pregnant women. As demonstrated by this case report, the diagnosis is frequently made incidentally during surgery. Management is multidisciplinary, which underscores the significance of seamless collaboration among various stakeholders, including obstetricians, surgeons, anesthesiologists, and radiologists.

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Guarantor

Hamidou Soumana Diaouga M.D

Research registration number

Not applicable.

Ethical approval and consent to participate

Written informed consent was obtained from the patient for publication and any accompanying images. A copy of the consent is available upon request. The publication of this case report has been authorized by the quality service of our Institution because case reports are exempted from ethical approval in our institute.

Declaration of Generative AI and AI-assisted technologies in the writing process

Language model AI was employed to improve the grammar and spelling checking during manuscript writing.

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Author contribution

Yahouza Boka Tounga and Hamidou Soumana Diaouga: Managed the patient, conceptualized the manuscript, data collection and analysis, and writing the manuscript draft.

Issifou Hama Sidi Mansour and **Kadi Ide**: data analysis, revision of the manuscript.

Madi Nayama and **Rachid Sani**: supervised the entire manuscript preparation.

All authors read and approved the final version to be published.

Conflict of interest statement

The authors declare no conflicts of interest.

Data availability

Not applicable.

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