Mechanical small bowel obstruction as a complication of pregnancy

Niedrożność mechaniczna jelita cienkiego wikłająca ciążę

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Słowa kluczowe: ciąża, mechaniczna niedrożność jelit, resekcja jelita.

Abstract

Abdominal pain is a common complaint in pregnancy. Intestinal obstruction reported in pregnancy varies, ranging from 1 in 1500 to 1 in 66431 pregnancies. Unfortunately, "dormant alertness" can lead to delayed surgical intervention, which in turn can increase the risk of complications that pose a threat to the mother as well as her foetus. The paper presents a case of a 23-year-old pregnant woman diagnosed with mechanical small bowel obstruction in 27 hbd, which required surgical emergency operation. The necrotic loop of the small intestine was resected. Despite tocolysis, which was necessary on the second day following the surgery, the patient was discharged home in good condition, with her pregnancy intact.

Streszczenie

Ból brzucha jest dolegliwością, która stosunkowo często pojawia się w ciąży. Częstość występowania niedrożności jelit w ciąży jest różnie oceniana i waha się od 1 : 1500 do 1 : 66 431 ciąż. Niestety w związku z ,,uśpioną czujnością" może dojść do opóźnienia odpowiedniego postępowania zabiegowego, co zwiększa ryzyko rozwoju powikłań groźnych zarówno dla matki, jak i płodu. Przedstawiono przypadek 23-letniej kobiety w ciąży, u której w 27. tygodniu ciąży wystąpiła niedrożność mechaniczna jelita cienkiego wymagająca pilnej interwencji chirurgicznej. U pacjentki resekowano martwiczą pętlę jelita cienkiego. Mimo konieczności zastosowania tokolizy w drugiej dobie od zabiegu pacjentkę wypisano do domu w stanie dobrym z ciążą zachowaną.

Introduction

Abdominal pain is a common complaint in pregnancy. Most pains develop due to minor causes such as ligamentous pain or infection of the urinary passages. Conditions that require surgical intervention are quite rare. Unfortunately, "dormant alertness" can delay intervention, which in turn increases the risk of complications threatening both mother and her foetus.

Intestinal obstruction occurs with varied frequency ranging from 1 in 1500 [1] to 1 in 66,431 pregnancies [2–4]. Polish literature reports small bowel obstruction from 1 in 25,000 pregnancies [5] to 1 in 10,000 [6]. This pathology can develop at any time during pregnancy, most frequently in the second and third trimester [6] and in the postpartum period [7]. Few authors report its occurrence in the first trimester (6% all obstructions observed in pregnancy) [7].

The death rate in pregnant women from intestinal obstruction has decreased to 6% in the last 30 years; however, the foetal death rate remains high, at ca. 20% [8]. According to Oleszczuk *et al.* the statistics are higher: the death rate for mothers is 20–25%, and foetal deaths amount to almost 50% [5].

Diagnosing small bowel obstruction (SBO) in pregnancy on physical examination is difficult, as the physiology of the pregnant body is typically altered. Unfortunately, doctors are generally reluctant to undertake unnecessary surgical intervention, which is also important in that respect [9].

The paper presents a case study of a 23-year-old pregnant woman diagnosed with mechanical SBO in 27 hbd, which required emergency surgical intervention.

Case report

The patient, 23-year old pregnant, was brought to hospital by ambulance in the afternoon. She was admitted to the ward of Obstetrics and Gynaecology, Regional Specialist Hospital, Kielce. On admission she presented with severe abdominal pains for an hour and vomited once.

Gynaecological-obstetric history: menarche – at the age of 13 years; periods regular every 26 days lasting 6 days, of scarce flow, painless. Last period on September 11, 2009, usual course. The patient was well until the admission; her pregnancy was managed by a specialist at the Outpatient Gynaecological-Obstetric Clinic. Past medical history revealed she had had an appendectomy in 2009.

On examination temp. 36.8°C, pulse 78/min, RR 120/70 mm Hg. Her skin was pink and warm, and no oedemas were present. There had been no respiratory failure. The abdomen was slightly distended and tender, peristalsis normal, and Goldflam sign (CVAT+) positive on the right side.

Obstetric examination: the uterus was soft, the fundus height reaching tow fingers over the umbilicus.

In vaginal speculum: milky discharge in the vagina; per vaginam – the vaginal part of the cervix was well-formed, the birth canal was closed, foetus presentation was difficult to assess, over the pelvic inlet, there was no outflow of amniotic fluid, foetal kicks could be felt, fetal heart rate (FHR) – 125/min.

USG scan: one foetus in the pelvic cavity, live, head presentation, FHR not taken, placenta on the anterior wall, grade I placental maturity on Grannum grading, no features of placental detachment, normal volume of amniotic fluid.

Cardiotocography: CTG – no cramps signalling delivery, record reactive. Laboratory results: CBC – RBC 3.29 × 10^6/µl; haematocrit 30.7%; haemoglobin 10.8 g/dl; WBC 20.1 × 10^3/µl, Pt 242 × 10^3/µl. Urinalysis: specific gravity 1.015; colour: straw, cloudy, LEU – neg; NIT – neg; pH 8; ERY – neg; PRO – neg; GLU – neg; ASC – 0,2 g/l; KET – 5 mmol/l; UBG – norma; sedimentation: numerous amorphic phosphates.

Medication ordered during treatment: metamizol 1 amp. *i.m.*, papaverinum 1 amp. *i.m.*, diazepam 1 amp. *i.m.*; drotaverine 1 amp. i.*m.*; fluids: 1000 ml *i.m.*

The patient's condition did not improve. A surgeon consulted the patient.

Surgical examination: the abdomen was slightly distended, tender over the whole area, and with peristalsis present. Per rectum: the rectum ampulla was filled with faecal contents. Indications: CBC, CRP, serum diastases, kidney and liver function tests; 2000 ml fluids *i.m.*, drovaterine 2 × 1 amp. *i.m.*; pethidine 100 ml *i.v.*; lidocaine *i.v.*.

Repeated surgical consultation was suggested, if needed.

Lab results (retaken): CBC: RBC 3.25 × 10^6/µl; haematocrit 30.5%; haemoglobin 10.8 g/dl; WBC 16.2 × 10^3/µl, Pt 230 × 10^3/µl; asparagine aminotransferase (AST) 27 U/l; alanine aminotransferase (ALT) 14 U/l; bilirubin 0.80 mg/dl; glucose 110 mg/dl; urea 10 mg/dl; creatinine 0.63 mg/dl; amylase 34 U/l, lipase 24 U/l; Na 134 mEq/l; K 3.60 mEq/l; CRP 27.89 mg/l.

Abdominal pains did not subside despite the applied medication. In the evening the patient reported progressive abdominal pains accompanied by strong pain radiating down the spine. She was transferred to the ward of General, Oncological, and Endocrinological Surgery, and an emergency operation was performed.

Surgical procedures: Resectio illei tenui. Deliberatio adhesiones, Drainage cavi abdominalis.

The surgery: A medial incision above and below the umbilicus was made. The peritoneal cavity was cut open and ca. 300 ml of fluid was evacuated – cloudy, blood streaked, without any specific odour. To the right of the pregnant uterus there was a conglomerate of small intestine loops tethered together and tightened around the adhesion, at the mesentery level, of an already twisted and black loop of the small intestine.

The adhesions and the segment of the intestinal loop without peristalsis were released, and adjacent segments of the intestine were checked for other adhesions. Numerous adhesions were located and released. A dead segment of the small intestine, ca. 30 cm long, was clammed at the healthy ends and amputated after conventional separation from the mesentery. Bowel continuity was restored by end-to-end anastomosis with two-layer sutures and several single ones to decompress the anastomotic area. The opening left in the mesentery was sutured and Redon drains were inserted below, on the right side of the small pelvis. The peritoneum and fascia were sutured with single sutures, and the abdomen was closed with layer sutures.

Post-operative diagnosis: Torsio et necrosis ilei tenui, Graviditas.

Histopathology result: Infarctus haemorrhagicus intestine tenuis, Excisio radicalis, Imbibition haemorrhagica cum necrosae telae adiposae mesentheri.

Post-operative course was uneventful, with the wound healing normally. There was no respiratory failure, and temperature, pulse, and blood pressure were within normal ranges. The lab parameters normalised.

Medication: cefuroxine 3 × 1.5 g *i.v.*; nadroparin, painkillers, fluids. The patient was followed up by an obstetrician, and FHR was monitored regularly.

On the second day following the operation the patient reported pain in the lower abdomen. A physical

examination revealed tense uterus; per vaginam – the vaginal segment of the uterine cervix was slightly shortened, the birth canal closed, the foetal head was over the pelvic inlet, and no leakage of the amniotic fluid was observed. FHR+ 150/min, foetal kicks were easily felt.

Tocolysis: $MgSO_4$, IV, progesterone-lutein 2 × 1 vaginal suppository. The patient was given betamethasone – Celeston 2 × 12 mg *i.m.*, which produced improvement, and no contractions of the uterus occurred.

On the 7th day following the surgery the patient was released home in general good condition and with her pregnancy intact. The patient was recommended a follow-up at the Outpatient Clinic of Surgery and Pathology of Pregnancy and vaginal progesterone suppositories.

Discussion

Differential diagnosis of abdominal pain refers to numerous illnesses, from mild to severe, for pregnant and for non-pregnant women [10].

Physiological changes developing in the pregnant body can make proper diagnosis difficult. The growing uterus is bound to change the location of the stomach and intestines, dislocating them upwardly and increasing abdominal pressure. However, it does not negatively affect metabolic processes. Smooth muscles of the alimentary tract relax due to the effects of progesterone. Muscular movements slow down, the oesophageal sphincter muscles fail to work effectively, and the lumen of the alimentary tract widens. This causes the intestinal contents to stagnate, which results in constipation, and gastroesophageal reflux causes heartburn [11].

As a consequence of this 50–90% of pregnant women suffer from nausea and vomiting, and in most cases these symptoms occur in the first trimester [6].

The uterus, adnexa, distal segment of the small bowel, sigmoid, and the rectum have a common visceral nerve supply, so identifying the source of pain is difficult [9].

Moreover, in pregnancy the blood volume in the circulation increases by 30–50%, which, in rare cases, can produce late symptoms of hypovolaemia. The number of leukocytes increases gradually. In the first trimester it can reach 16,000 WBC/ml, and towards the termination of pregnancy and during delivery it can be as high as 20,000–30,000 WBC/ml [12].

Bowel obstruction is either functional or mechanical. In functional bowel obstruction, i.e. paralytic ileus, the nerves or muscles of the intestine no longer function as a result of, for example, peritonitis or reflex reaction to severe abdominal pain. Mechanical obstructions occur due to physical blockage to the passage of food. Common causes of mechanical obstruction are bowel strangulation, intussusception, or blockage. Bowel strangulation is twisting of the bowel with its mesenteric segment and blood vessels, which blocks bowel lumen or hernia incarceration when a segment of the intestinal wall and the mesentery be come stuck in the hernia opening. Strangulation is the most common type affecting the small bowel [13]. The risk of SBO is high, especially in women with a history of abdominal surgery. Post-operative adhesions, decreased intestinal tone, and displacement due to the growing uterus pose a great risk to pregnant women [6].

In the presented case the patient had a history of appendectomy. The small bowel obstruction was caused by mechanical strangulation. Intra-operative findings confirmed numerous adhesions in the abdominal cavity. On the right of the pregnant uterus a conglomerate of tethered loops of the small bowel strangulated around the adhesion, at the mesentery level, an already twisted and black loop of the small bowel was found. In addition to a classic cause of strangulation, i.e. adhesion (54%), our patient developed twisted bowel, which is the second most common cause of SBO (25%) [7].

Probably the history of past appendectomy contributed to the clinical condition in our patient.

According to the data reported in literature, in a group of 118 patients with SBO due to adhesions, such a pathology was more frequent in patients with advanced pregnancy: 6% in the first trimester, 28% in the second, 45% in the third, and 21% postpartum [7, 13, 14]. In the case described it occurred in the 27th hbd, which complies with the data quoted above.

Clinical symptoms of bowel obstruction include abdominal pain (89%) (which should be differentiated from uterine cramps), vomiting (89%) (which is differentiated from hyperemesis gravidarum), abdominal distension, gas blockage, fever, and weakened intestinal peristalsis with metallic tone [6].

In the case presented, severe abdominal pain caused the patient to call the ambulance service. The pain did not resolve despite conservative treatment by medication implemented at the Pathology of Pregnancy Ward. Literature reports that pain caused by bowel ischaemia is extremely severe [7, 13, 15, 16]. Compromised perfusion to the intestine leads to ischaemic bowel obstruction. The symptoms of bowel infarction predominate over the usual, less severe symptoms of common obstruction. The pain is ongoing, and if the bowel infarction has affected the mesenteric vessels, it can also be felt in the back [7].

After a few hours on the ward our patient reported progressive symptoms accompanied by spinal pains despite the ordered medication, which undoubtedly facilitated the surgeons' decision regarding emergency operation.

Moreover, vomiting is a problematic symptom. Nausea is a common complaint during the first 14–16 weeks of pregnancy (50–90%), and 33% of pregnant women suffer from vomiting [6]. Our patient was sick

only once despite her serious situation. Peristalsis was unaffected. Fibak suggests postponing surgical intervention if peristalsis is distinctly heard and no vomiting after meals has occurred, with a great probability that peritonitis has not developed [15].

Difficulties in diagnosing SBO in pregnancy contribute to a greater number of complications and worse prognosis, in comparison to the general population [17].

Leucocytosis, a physiological phenomenon in pregnancy, lowers the diagnostic value of that parameter [6]. Similarly, increased temperature and higher CRP do not always facilitate proper diagnosis [18, 19]. Electrolytes and parameters of kidney function are better in that respect. Fluids that enter the lumen of the intestine accompanied by vomiting can lead to hypocalaemia and decreased kidney flow [7, 20].

Perdue *et al.* reported that 23% of pregnant women and women in postpartum developed ischaemia and bowel necrosis, which were the cause of emergency operation and partial bowel resection [20]. In that group 26% foetal death and 6% death in pregnant women occurred.

In each case, if bowel vitality is doubtful, after the colour of the intestinal wall, its tone, peristalsis, and the tone of mesenteric flow have been carefully assessed, the necrotic segment needs to be resected [13, 17]. In the case described above, the condition of the intestine was eligible for resection – dead segment, ca. 30 cm long, was clamped at the healthy ends and amputated after conventional separation from the mesentery. Post-operative histopathological examination confirmed ischaemic bowel infarction.

Post-operatively the patient was stable and her condition soon returned to normal. The foetus was monitored and its wellbeing confirmed. On the second day following the operation the patient complained of a slight pain in her lower abdomen. The obstetric examination found increased tone of the uterine muscle and shortened segment of the vaginal part of the cervix. Prompt treatment was implemented to avoid threatening pre-term delivery. The patient's condition improved dramatically, the symptoms resolved, and on the 7th day she was released home.

It has to be emphasised that operating on a pregnant woman is not the preferred option but it is often the treatment of choice, producing better effects and fewer complications than conservative treatment [21].

Interdisciplinary attitude towards the issue of bowel obstruction in pregnancy, considering the physiological changes that develop in the pregnant body, increase the chances of avoiding complications that endanger both the mother and her growing foetus.

Conflict of interest

The authors declare no conflict of interest.

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