CASE REPORT

Internal hernia in late pregnancy after laparoscopic Roux-en-Y gastric bypass

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SUMMARY

A 27-year-old patient in late pregnancy presented to the department of obstetrics with crampy abdominal pain located in the right flank, 3 years after a laparoscopic Roux-en-Y gastric bypass. Clinical investigation showed tenderness on palpation in the upper abdomen without signs of peritonitis. The cardiotocogram and blood tests were normal. The ultrasound showed a hydronephrosis on the right side, and a pigtail catheter was inserted. The abdominal symptoms did not abate and the abdominal surgeon was consulted 36 hours after admission. Diagnostic laparoscopy was performed promptly because of high suspicion of internal hernia (IH). Laparoscopy showed IH at the mesojejunal intermesenteric defect with a herniated common channel and volvulus of the anastomosis. Conversion to open reduction and complete closure with non-absorbable interrupted sutures was performed. Small bowel resection was avoided. The patient was discharged 10 days after the operation and a healthy boy was born 4 weeks later.

BACKGROUND

Laparoscopic Roux-en-Y gastric bypass (LRYGB) is currently the most commonly performed bariatric procedure^{1 2} providing excellent long-term results with low morbidity and mortality.¹ However, one of the most challenging complications of LRYGB is the occurrence of an internal hernia (IH), which can lead to bowel necrosis and lethal sepsis if not treated accurately. After antecolic and antegastric LRYGB, IH can occur at an open space between the mesentery of the alimentary (Roux) limb and the mesentery of the transverse colon (called Petersen's space), at the intermesenteric defect and interintestinal created at the enteroenterostomy site^{3 4} (figure 1). Clinical presentation can be misleading because abdominal symptoms and laboratory inflammation parameters are often normal. Patients can show signs of chronic intermittent pain or symptoms of acute small bowel obstruction.^{2 5} The diagnosis of abdominal pain in pregnancy is challenging in itself. Owing to the increasing number of bariatric surgeries and the increased number of women of childbearing age where LRYGB have been performed,^{6 7} more pregnant patients seek help for unclear abdominal pain after LRYGB. The case we are presenting is one of IH through the intermesenteric defect at the jejunojejunostomy in late pregnancy, 3 years after LRYGB.

CASE PRESENTATION

A 27-year-old patient, in late pregnancy (34th gestational week), presented to the department of

1 = Petersen's space
2 = mesojejunal space

Figure 1 Petersen's space and mesojejunal space.

obstetrics with crampy abdominal pain located in the right flank. Her medical history showed that 3 years earlier, a LRYGB with antecolic positioning of the alimentary limb had been performed. Weight loss was 50 kg after 3 years. Clinical investigation showed tenderness on palpation in the upper abdomen but no signs of peritonitis.

INVESTIGATIONS

The cardiotocogram and the movements of the child were both normal as were all blood tests. The ultrasound showed a hydronephrosis on the right side, but no other abnormal findings.

TREATMENT

Symptomatic therapy with opioids and antispasmodics as well as tokolysis showed no symptom relief. Owing to the hydronephrosis, a urologist was consulted and a pigtail catheter inserted. The abdominal symptoms did not abate after the resolution of hydronephrosis. Owing to persistent diffuse and crampy pain refractory to opioid treatment, the on-call abdominal surgeon was consulted 36 hours after admission for further investigations. Diagnostic

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laparoscopy was performed promptly because of the high suspicion of IH. The operation was performed with a consultant from gynaecology, and proper maternal and fetal monitoring in place. Laparoscopy showed an IH at the mesojejunal intermesenteric defect with a herniated common channel and volvulus of the anastomosis. Reduction could not be performed because of high tension on the small bowel and the risk of perforation. Conversion to open reduction and complete closure with non-absorbable interrupted sutures was performed. The small bowel showed reversible ischaemia of the common channel, which resolved promptly after reduction of the hernia. Small bowel resection, was avoided.

OUTCOME AND FOLLOW-UP

In the postoperative course, a urinary tract infection was diagnosed. The pigtail catheter was withdrawn on the seventh postoperative day and antibiotics were administered to treat the urinary infection. The postoperative ultrasound as well as the cardiotocogram were both normal. The patient was discharged 10 days after the operation. A healthy boy was born 4 weeks later through a caesarean section, in accordance to the wishes of the patient.

DISCUSSION

Bariatric surgery (BS) has proven to reduce long-term morbidity and mortality in obese individuals.^{8 9} Patients have the best benefit after BS if it is performed at a young age, due to the fact that complications from obesity can best be avoided with early weight loss. In our experience, women of childbearing age often enquire about the potential risks after BS to a future pregnancy. In general, BS is not associated with adverse perinatal outcome^{10–14} and the risk for obesity-related gestational complications is reduced, as long as nutrition is maintained and adherence to diet is assessed.^{10 11 13 15–18}

BS can also help young obese women to get pregnant due to the fact that weight loss resolves in a reduced occurrence of hyperandrogenism and of polycystic ovary syndrome, which can lead to a postbypass fertility rebound.^{7 13 16 18} We recommend performing BS in sufficient time before planned pregnancy in order to benefit from the positive effects of effective weight reduction. Similar to the management before and after BS, postoperative care for pregnant women after BS should be multidisciplinary with consultations with a nutritionist, surgeon and gynaecologist to prevent and detect nutritional deficiencies.^{11 14–18} Contraception should be recommended 1 year or until the weight has stabilised.^{11 13–16} Symptoms of potential complications should be explained to the patient and the consultant gynaecologist.

An IH is defined as intermittent or persistent herniation of abdominal viscus through an opening within the peritoneal space.¹⁹ IH after LRYGB remains a small risk (0.5–9%)^{2 20} but can occur at any time after surgery. Patients with IH might show symptoms of small bowel obstruction (SBO), for example, abdominal pain, nausea or vomiting.²⁰ However, these symptoms are non-specific, and nausea and vomiting are especially common in pregnancy. Additional blood tests provide little help in differentiation.²¹ The lack of specific signs and blood tests for IH can lead to a delayed diagnosis and intervention.

A CT scan is often mandatory in the evaluation of abdominal pain after LRYGB and is the preferred radiographic imaging for the diagnosis of an IH, even though its sensitivity is low.^{20 21} Signs of IH in a CT scan might be seen as SBO with clustered small bowel loops, or more specifically—the swirled appearance of mesenteric fat or vessels at the root of the mesentery (swirl sign), a mushroom shape of the mesentery, distal tubular

Figure 2 Abdominal CT scan showing torsion of small bowel mesentery ('swirl sign')

mesenteric fat surrounded by bowel loops or a small-bowel loop behind the superior mesenteric artery.^{2 19 22} The swirl sign (figure 2) is a specific indicator of an IH through Petersen's space and has sensitivity of 74% and a specificity of 83%.²² Even in pregnant women, a low-dose CT scan could be performed because the radiation dose applied by a scan of the abdomen and pelvis is considered safe.^{23 24} Even with knowledge of specific CT signs of IH, it may be non-diagnostic.^{20 22} If a CT scan is performed, it should be analysed by an experienced radiologist and bariatric surgeon to increase the accuracy of IH diagnosis.²⁵

Anatomic changes with enlargement of the uterus and increased abdominal pressure combined with weight loss due to LRYGB may lead to a higher risk of displaced bowel loops becoming trapped in an IH in a pregnant woman.^{11 20 26} Consistent with these anatomical changes, most described cases of IH during pregnancy occurred in the second or third trimester.^{27–39} Only one reported case occurred in the first trimester.³⁵

As with our case, there are several reports of pregnant women who have been hospitalised for more than 1 day until bariatric surgeons have been consulted or an operation has been performed.^{28 31 32 35 37} In the only two reported cases of maternal death^{28 37} and in one of three where the fetus died,^{28 33 36} the patient had been in the hospital for more than 1 day. This represents a lack of awareness among non-abdominal surgical units regarding the potential complications after bariatric surgery.

Many surgeons believe that diagnostic laparoscopy is the only way to diagnose an IH and there should be a low threshold in

Learning points

- ▶ Abdominal pain in pregnant women after laparoscopic Roux-en-Y gastric bypass must raise high suspicion of internal hernia (IH) and should be treated with a multidisciplinary approach, including consulting a bariatric surgeon.
- ▶ If a CT scan is performed, it should be analysed by an experienced radiologist and a bariatric surgeon.
- ▶ The threshold for a diagnostic laparoscopy should be low.
- ▶ Any delay of treatment of IH can lead to maternal and fetal death.

surgical exploration in any patient where an IH is suspected.^{2 5 40} Diagnostic laparoscopy in pregnant women is effective and is associated with a good maternal and fetal outcome.^{23 41 42} Premature labour, miscarriage or fetal death appears to be related to the underlying pathology.^{23 41 42} There is no doubt that especially in pregnant women with uncertain presentation, early diagnostic laparoscopy is mandatory to protect the mother and child from a potentially lethal outcome.

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