

Petersen Hernia in Pregnancy: A Report of Two Cases and Their Radiologic Findings

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PATIENT DESCRIPTION

Internal hernia, defined as a protrusion of an intraperitoneal viscus into a recess or compartment within the peritoneal cavity, is a known late complication following laparoscopic Roux-en Y gastric bypass (LRYGB) surgery. Petersen hernia is a type of internal hernia formed after Roux-en Y reconstruction between the transverse mesocolon and the Roux limb. The diagnosis of internal hernia might be elusive due to nonspecific clinical and radiological findings [1]. Clinical presentation of internal hernia in pregnancy is even more challenging due to the frequency of nonspecific abdominal pain and radiological limitations. We present the cases of two pregnant women diagnosed with Petersen hernia, both of whom had a history of LRYGB.

CASE 1

A 30 year old woman who was 24 weeks pregnant presented with 3 days of colicky abdominal pain. The patient had undergone LRYGB 5 years earlier and had lost 35 kg. Physical examination revealed diffuse abdominal tenderness without obvious signs of peritonitis. Computed tomography (CT) showed dilated jejunal loops, mesentery edema, and whirl-like appearance suggesting swirling of bowel loops and mesenteric ves-

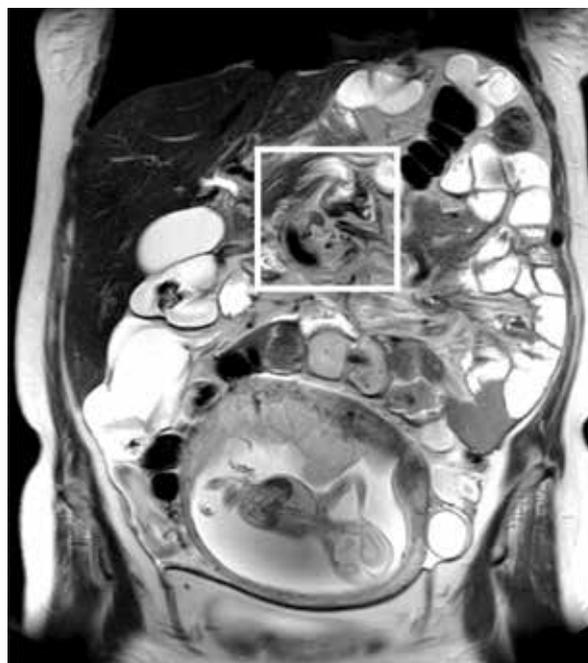
sels. The compression of mesenteric vessels is associated with vascular compromise of distal bowel loops, seen as thickened bowel wall. Ultrasound revealed intrauterine fetal demise. Emergent laparotomy was performed finding extensive intestinal necrosis due to Petersen hernia. Surgical evacuation of the fetal remnants and wide intestinal resection were performed. The patient remained with short bowel syndrome and had a protracted and complicated course with anastomotic leak and sepsis. She was eventually discharged from the hospital.

CASE 2

A 41 year old woman who was 17 weeks pregnant presented with 2 days of persistent

diffuse abdominal pain. She had undergone LRYGB 4 years earlier. Physical examination revealed minor abdominal tenderness without defense or rebound tenderness. A non-enhanced abdominal magnetic resonance imaging (MRI) was performed revealing a normal pregnancy, large fluid-filled gastric remnant, slight dilatation of the proximal small bowel in the left upper quadrant and a whirl-like appearance of the mesenteric root and the duodenum. These findings suggested an internal hernia with partial bowel obstruction [Figure 1], and the patient was taken for an urgent diagnostic laparoscopy. A Petersen hernia without signs of strangulation was found. The bowel was reduced and the hernia

Figure 1. Coronal T2 image showing a whirl-like appearance in the root of the mesentery (white box) and a normal pregnancy



defect was repaired with non-absorbable sutures. She had an uneventful recovery and was discharged on postoperative day 3. She carried her pregnancy to term and gave birth to a healthy child.

COMMENT

Diagnosis of internal hernia after LRYGB is challenging. Signs, symptoms, and radiological evaluation are often nonspecific or misleading [1]. The clinical signs may be mild to intermittent, even in the presence of evolving intestinal gangrene [2]. Blood tests provide little help in differentiation. CT scans, the first-line imaging technique in these patients, has low sensitivity with high false negative results [1]. During pregnancy, the clinical presentation, physical findings, and radiologic yield are further limited.

Although bariatric surgery is not associated with adverse perinatal outcomes, the risk for internal hernia may increase due to the enlarged uterus and increased intra-abdominal pressure. The first patient described in this article exemplifies the catastrophic potential of late diagnosis of incarcerated Petersen hernia during pregnancy.

A review by Gudbrand and colleagues [3] showed that the overall incidence of internal hernia after LRYGB is 0–10%. Reports on Peterson hernia during pregnancy are limited to case reports and series. Usually they describe a median 28 year old woman in the second or third trimesters of her pregnancy with symptoms of abdominal pain [3]. The best radiologic sign in CT for the detection of internal hernia is the mesenteric whirl sign [4]. Otherwise, less sensitive radiological signs of Petersen hernia are: displacement of the jejunum-jejunal anastomosis, mesenteric vessel engorgement, and secondary signs of bowel obstruction and bowel edema.

Ultrasound is limited in the evaluation of bowel obstruction, especially in the pregnant population with distended abdomen and enlarged uterine sac that displaces bowel loops. The use of MRI is well established for some entities in pregnant women [5]; however, so far, no reports have been published regarding the specific signs of internal hernia in MRI during pregnancy.

CONCLUSIONS

Internal hernia should always be suspected as a cause for abdominal pain after LRYGB.

In the setting of pregnancy, the timely diagnosis is of utmost importance due to the danger of fetal distress or even intrauterine death. CT and MRI should be used liberally in this context.

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Capsule

Minimum performance on clinical tests of physical function to predict walking 6000 steps/day in knee osteoarthritis: an observational study

Evidence of physical function difficulties, such as difficulty rising from a chair, may limit daily walking for people with knee osteoarthritis (OA). **Master** and collaborators identified minimum performance thresholds on clinical tests of physical function predictive to walking ≥ 6000 steps/day. This benchmark is known to discriminate people with knee OA who develop functional limitations over time from those who do not. Using data from the Osteoarthritis Initiative, the authors quantified daily walking as average steps/day from an accelerometer (Actigraph GT1M) worn for ≥ 10 hours/day over 1 week. Physical function was quantified using three performance-based clinical tests: five times sit-to-stand test, walking speed (tested over 20 meters), and 400-meter walk test. Among 1925 participants (mean ± SD age 65.1 ± 9.1

years, mean ± SD body mass index 28.4 ± 4.8 kg/m², and 55% female) with valid accelerometer data, 54.9% walked ≥ 6,000 steps/day. High specificity thresholds of physical function for walking ≥ 6000 steps/day ranged 11.4–14.0 seconds on the five times sit-to-stand test, 1.13–1.26 meters/second for walking speed, or 315–349 seconds on the 400 meter walk test. Not meeting these minimum performance thresholds on clinical tests of physical function may indicate inadequate physical ability to walk ≥ 6000 steps/day for people with knee OA. Rehabilitation may be indicated to address underlying impairments limiting physical function.

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Eitan Israeli

“When a person doesn’t have gratitude, something is missing in his or her humanity. A person can almost be defined by his or her attitude toward gratitude”

Elie Wiesel (1928–2016), Romanian-born American Jewish writer, professor, political activist, Nobel Laureate and Holocaust survivor