Chirurgia Polska 2016, 18, 1–2, 24–27
ISSN 1507–5524

VIA MEDICA

Portal vein thrombosis after sleeve gastrectomy in 32-year-old morbidly obese woman

Zakrzepica żyły wrotnej po zabiegu rękawowej resekcji żołądka u 32-letniej kobiety z otyłością patologiczną

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Abstract

Portal vein thrombosis after laparoscopic procedures is an uncommon complication, but potentially life threating. Possible etiologic factors include venous stasis due to increased intra-abdominal pressure, intraoperative manipulation, or damage to the splanchnic endothelium and systemic thrombophilia states. We describe a case of a 32 year old morbidly obese patient, qualified for surgical treatment of obesity. After a laparoscopic gastric resection — a sleeve gastrectomy — on the 20th day after hospital discharge, the patient was re-admitted to the surgical ward due to uncharacteristic abdominal pain, nausea, vomiting and increased cholestasis indicators. The patient was diagnosed with portal system thrombosis. Following the treatment the patient achieved complete remission of symptoms. Given a growing number of laparoscopic procedures, we may expect an increasing number of similar complications. This condition needs to be considered in patients with unexplained abdominal pain after several laparoscopic procedures.

Key words: obesity, sleeve gastrectomy, laparoscopy, portal vein thrombosis, abdominal pain

Chirurgia Polska 2016, 18, 1–2, 24–27

Streszczenie

Zakrzepica żyły wrotnej po zabiegach laparoskopowych jest rzadkim powikłaniem, ale potencjalnie zagrażającym życiu. Do rozwoju zakrzepicy predysponują liczne czynniki, jak zastój żylny z powodu zwiększonego ciśnienia w jamie brzusznej, śródoperacyjna manipulacja wewnątrzotrzewnowa, uszkodzenie śródbłonka naczyń trzewnych oraz trombofilią.

Opisujemy przypadek 32-letniej pacjentki z patologiczną otyłością zakwalifikowaną do chirurgicznego leczenia otyłości. Po laparoskopowej resekcji rękawowej żołądka, w 20. dniu po wypisie ze szpitala, pacjentka została ponownie przyjęta na oddział chirurgiczny ze względu na nietypowe bóle brzucha, nudności, wymioty i podwyższenie wskaźników cholestazy. U pacjentki stwierdzono zakrzepicę żyły wrotnej. Po wdrożeniu leczenia zachowawczego uzyskano całkowitą remisję objawów. Biorąc pod uwagę rosnącą liczbę zabiegów laparoskopowych, należy spodziewać się zwiększenia częstości występowania podobnych powikłań. Powinno się o tym zawsze pamiętać u pacjentów z niewyjaśnionymi bólami brzucha poddanych procedurom laparoskopowym.

Słowa kluczowe: otyłość, resekcja rękawowa żołądka, laparoskopia, zakrzepica żyły wrotnej, ból brzucha

Polish Surgery 2016, 18, 1–2, 24–27

Introduction

Portal vein thrombosis is a rare, but potentially, life threatening condition. Its diagnosis often creates considerable diagnostic challenges because of limited specific symptoms. The predisposing factors for developing portal vein thrombosis are the formation of clots in the vessels, consequently leading to the impairment of their patency. We divide them into two main groups, known as systemic and local factors. Among systemic factors the following factors can be suggested: coagulation disorders, proliferative processes and multifactorial thrombophilia, advanced age, obesity, pregnancy and the postpartum period, oral hormonal contraceptives and cigarette smoking. The second group comprises local factors of which the most important is cirrhosis (responsible for nearly 40% of cases of portal vein thrombosis) as well as trauma, infection, local inflammation, and proliferative processes in the surrounding organs [1, 2].

Clinical situations, which may predispose to portal vein thrombosis can also be related to the method of surgery performance, especially in the coexistence of other thrombosis risk factors [1, 3–5]. Taking into account the current knowledge, in the patients undergoing laparoscopic surgery the exact cause of this complication after laparoscopy is not fully clear. On the other hand, in laparoscopy surgery cases, there is a group of factors that may predispose to it: among the others an induction of pneumoperitoneum insufflation should be mentioned. The increase in the intra-abdominal pressure may result in a decrease in the flow in the portal vein, which creates favorable conditions for the thrombus formation. Additionally, it has been proven that the intraoperative manipulation around blood vessels may predispose to the thrombosis occurrence [6]. Another important predisposing factor is failed prophylaxis in the form of low molecular weight heparin administration. It is worth noting that despite over 20 years of experience in minimally invasive techniques, we have yet to find papers on portal vein thrombosis in procedures other than those in which there is a direct breach of the portal area along with its tributaries and branching [1, 3, 7].

Case report

The case report concerns a 32-year-old morbidly obese patient (BMI = 45 kg/m^2), with no other comorbidities, who smoked about 20 cigarettes a day before a bariatric procedure and applying hormonal oral contraception until the last cycle before the surgery. After numerous tests, which included gastroscopy, a chest X-ray, an echocardiogram, a venous Doppler ultrasound of the lower limbs and abdomen, an ECG, an ultrasound of the thyroid as well as lab tests, she was cleared for laparoscopic surgery — a sleeve gastrectomy. The surgery was performed under general anesthesia. The antithrombotic prophylaxis and a three-day perioperative antibiotic therapy were administered. After the pneumoperitoneum was produced, the trocars were introduced in typical locations, and the patient was put in a Trendelenburg position, the peritoneal cavity was inspected and it showed signs of fatty liver. A sleeve gastrectomy was performed using a linear endostapler. The control of the anastomotic leak (methylene blue) went negatively. After checking hemostasis, the draining of the operated area was conducted. No complications were experienced in the course of peri- and postoperative procedures. After a radiological anastomotic leak trial, the patient was discharged on postoperative day three, in good general condition, without pain, with a recommendation to use low molecular weight heparin for another 10 days. On the 20th day after the surgery, the patient came back to the hospital with abdominal pain lasting for three days, radiating to the back, with nausea and vomiting. The problems intensified the day she came back to the hospital. In addition, the patient reported a periodic low-grade fever and general weakness. During hospital admission the patient denied any dietary mistakes. The physical examination during admission indicated a slightly distended belly, mainly in center epigastric and on the right, without any peritoneal signs. The peristalsis was present, lazy. A discrete yellowing of the white parts of the eyes was detected. In laboratory studies: CRP 294 mg/L, Hg 11.5 g/dL, RBC 4.680 million/mm^3, WBC 11 thousand/ mm^3, PLT 60 thousand/mm^3, prothrombin content of 78%, 18 s prothrombin time, INR 1.31, ALAT 67U/L, AST 58 U/L, total bilirubin 2.35 mg/dL, in urine diastase 1637 U/L, serum alkaline phosphatase 201 U/L, total protein was 53 mg/dL. The abdominal ultrasound revealed no abnormalities. The plain abdominal X-ray detected single fluid levels, without any evidence of obstruction. The patient was hospitalized and given a conservative treatment. The patient did not achieve a clinical improvement and the markers of cholestasis (bilirubin total 4.66 mg/dL, alkaline phosphatase 240 U/L) were on the rise. On the 3rd day of hospitalization a cholangio-MR was performed. It showed inflammation of the gallbladder and suspected changes ignited within the descending part of the duodenum due to presence of a small amount of fluid in the area. Initially it was suspected as the cause of symptoms of the gastric anastomotic leak, but the radiation leak test with an aqueous solution uropolin ruled out this cause. A panendoscopy did not confirm a peptic ulcer disease. A computed tomography of the abdomen showed some inflammatory infiltration within the network covering the duodenum and blood supply disorders coexisting within the inflammatory hepatic hilar region. There was also a small amount of fluid in the pleural cavities and inflammatory changes in the lower lobe of the left lung. No pathogens grew in the blood culture. The ultrasound, supplemented by Doppler, indicated that there were no other pathological changes in the abdomen other than those previously detected. In addition to a standard procedure which includes prophylaxis with low molecular weight heparin, pain killers, proton pump inhibitors, antibiotic (amoxicillin + clavulanate), metronidazol, fluid therapy 2500 ml/day and naso-gastric tube initially used (which was removed), an extended antibiotic therapy (piper-

cyline + tazobactam) and a nutritional regime – diet "0" (+ parenteral nutrition) were introduced. A gradual decrease in hemoglobin concentration to 7.9 g/dL and a drop in the hematocrit to 24.9% were observed on the 9th day of hospitalization — the patient received a transfusion of two units of PRBC, and after a week, due to the growing anemia, another three units of PRBC were transfused. During the fourth week of the hospitalization, the high CRP values 295 mg/L, a high level of bilirubin (3 mg/dL), an increase in AST to 121 U/L and an ever-growing value of GGTP (401 U/L) with a temporary increase in the body temperature to 39 degrees were observed. An angio-CT of the abdomen was performed. The study confirmed presence of inflammatory lesions in the liver, portal vein thrombosis and presence of the thrombus in the splenic vein and superior mesenteric vein initial section. The diagnosis was confirmed by a Doppler ultrasound study. Following the diagnosis, a 24-hour infusion of unfractionated heparin was administered (30,000 units per day) using an infusion pump, under the control of APTT. On the seventh day of heparinizing, a Doppler examination found a partial regression of changes in the portal vein. On the 10th day of the treatment an infusion of unfractionated heparin through an infusion pump was conducted. Again, low molecular weight heparin was used at a therapeutic dose. Then, after a further regression of thrombotic lesions, in the eight week of hospitalization, the patient was given an oral anticoagulant therapy, under the control of INR in the therapeutic range. The patient was discharged home with recommendations of a further oral anticoagulant therapy and an ambulatory control of the metabolic surgery. During follow-up outpatient visits, we found a gradual reduction of thrombotic changes in the portal vein system with a full withdrawal in the 41st week since their occurrence.

Discussion

According to the WHO in 2008, more than 1.4 billion adults were overweight and more than half a billion were obese. At least 2.8 million people each year die as a result of being overweight or obese. The prevalence of obesity has nearly doubled between 1980 and 2008 [8]. According to data 2011 from the Central Statistical Office, 18% of adults in Poland are obese, and 52% are overweight. Therefore it is understandable that we see a growing interest in bariatric surgery. In recent years there have been numerous clinical studies documenting the high efficacy of such surgeries, especially when compared with conservative methods such as drug therapy or lifestyle changes. The success of bariatric surgery is defined as a lasting weight loss and a normalization of metabolic parameters. Despite undoubtedly numerous advantages of bariatric surgery, the classification of patients for such surgery should be performed in a thoughtful and careful manner. Although bariatric surgery is thought to have a relatively low rate of serious complications — 2.5% — the nature of the procedure carries high risk for surgical patients [9]. A sleeve gastrectomy is currently the most frequently performed bariatric procedure in Poland [10]. It owes its popularity to relatively fast effects of weight loss and low metabolic disturbance. The complications associated with this technique include mainly leakage of the anastomosis, bleeding, stricture of the stomach, a gastroesophageal reflux disease, intra-abdominal abscesses, and wound infections. However, there can also be other complications such as pulmonary embolism, peritonitis, pneumonia and a respiratory failure. The overall risk of death associated with this procedure amounts to 0.19% [11].

Portal vein thrombosis, a complication of a cuffed laparoscopic sleeve gastrectomy, is very rare and the symptoms are atypical. Their intensity directly correlates with the extent of thrombosis. In the case of portal vein thrombosis the symptoms most frequently reported by patients were non-specific abdominal pain (90%), vomiting (77%), nausea (54%), diarrhea (36%) and less commonly abdominal distension, fever and bleeding from esophageal varices. Undetected portal vein thrombosis may extend to the adjacent vessel. When the flow impairment also applies to the inferior mesenteric, a severe colic pain and bloody stools may occur, consequently, this condition can lead to bowel ischemia and the formation of a portal hypertension, a late complication. Most patients experience symptoms for approximately two days before reporting them to the doctor [3]. Typical laboratory tests often are not helpful in the diagnosis, especially in the early stages of the disease.

Concerning our case, the results of the previous research were published in JAMA Surgery, an American medical journal, and included an impressive (in terms of scale) retrospective study [4], which rated incidents of portal vein thrombosis among patients undergoing laparoscopic bariatric surgery. Among 5,706 patients from six academic centers, 17 (or 0.3%), 16 after the sleeve and one after the band, had portal vein thrombosis. Although thrombosis as a complication of bariatric surgery may seem extremely rare, we have noticed more and more references to such complications in foreign medical literature, which seems to be associated with the increase in bariatric procedures. The laparoscopic treatment of obesity, a sleeve gastrectomy in particular, is still a relatively new method. Out of the diagnostic arsenal at our disposal (ultrasound, Doppler, CT, MRI), the angio-CT seems most effective, though the diagnosis should begin with a Doppler ultrasound, which has an extremely high negative predictive value, close to 98% [2]. The treatment aims to restore patency of the portal vein and prevent the spread of the splenic vein thrombosis and superior mesenteric. If applicable, according to a standard regimen unfractionated heparin or heparin at therapeutic doses followed by an oral anticoagulant should be administered, preferably for three-to-six months depending on risk factors. In the vast majority of cases, this treatment is sufficient. In a small number of cases, an endovascular intervention may be needed. In this case, our treatment did not deviate from the standards. Before readmitting the patient to hospital, we can find a number of risk factors leading to thrombosis

besides a history of a laparoscopic sleeve gastrectomy. The patients who underwent this type of surgery typically smoked approximately a pack of cigarettes a day and applied oral hormonal contraception. Probably the decisive factor for thrombosis within the portal system was ongoing inflammation of the duodenum network bags and gallbladder, as well as blood supply disorders coexisting within the inflammatory hepatic hilar region.

Conclusion

Portal vein thrombosis is a rare, but potentially, dangerous complication that always needs to be considered if patients report non-specific symptoms from the abdominal cavity a few days to a few weeks after a laparoscopic bariatric procedure. The differential diagnosis in these patients should include Doppler examinations, and in unclear cases, an angio-CT scan should be performed.

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Praca wpłynęła do Redakcji: 02.12.2016 r.