CASE REPORT

Portal vein embolisation in a patient with situs inversus

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SUMMARY

Portal vein embolisation (PVE) is a well-established technique used for patients who require major hepatic resections without sufficient volume of future remnant liver (FRL). We describe a case of PVE in a patient with situs inversus. Computed Tomography (CT) 4 weeks after the procedure demonstrated significant hypertrophy of the FRL. However, the surgical procedure was aborted due to signs of extrahepatic progression.

BACKGROUND

Combination of an unusual anatomical variation with an infrequent procedure.

CASE PRESENTATION

In 2012, a 54-year-old female patient with situs inversus totalis was diagnosed with metastatic rectal adenocarcinoma to the liver. The patient was initially treated with four cycles of neoadjuvant chemotherapy (capecitabine plus oxaliplatin) followed by pelvic radiotherapy. On multidisciplinary meeting, it was decided to ablate two hepatic lesions before rectal resection. After this treatment, a partial proctectomy with primary anastomosis and atypical hepatic resections for two metastatic liver nodules were performed. On 2 years' follow-up MRI, a new 4.2×4.0 cm hepatic lesion was found between segments V and VIII and it was resected. Three months later, local recurrence in the colorectal anastomosis and adenomas in the ascending and transverse colon were detected in a colonoscopy. Therefore, a proctocolectomy with terminal ileostomy was indicated. In 2016, 18F-fluorodeoxyglucose-positron emission tomography/CT scan demonstrated progression of disease with two new small pulmonary nodules and local recurrence of the hepatic lesion in the transition of segments V and VIII also observed in an abdominal MRI (figure 1). After these findings, it was initiated a conversion chemotherapy with FOLFOX (leucovorin and fluorouracil plus oxaliplatin) regimen. The patient had a good response with a drop of Carcinoembryonic Antigen (CEA) from 17.3 to 2.7 ng/mL and decrease in size of the pulmonary nodules. On a multidisciplinary meeting, it was decided to perform a right hepatectomy and treat the pulmonary nodules in another surgery. Volumetry of the liver showed total functional volume of 1620 g and 473 g volume of the left lobe corresponding to 29% of future remnant liver (FRL). Since she had been previously exposed to hepatotoxic chemotherapy, portal vein embolisation (PVE) was proposed.

TREATMENT

Under intravenous conscious sedation and local anaesthetic the portal vein was accessed percutaneously by a transhepatic approach using a micro-puncture set guided by ultrasound. We performed an ipsilateral approach obtained through the left side of the patient, since she had situs inversus totalis. After gaining access to the portal trunk, a 5Fr vascular sheath was placed using Seldinger technique. Portography was obtained with a 5Fr angiographic flush catheter (figure 2). Catheterisation of the right portal branches was possible with a microcatheter placed coaxially through a 5Fr reverse-curved catheter. The agent used for embolisation was n-butylcyanoacrylate mixed with Lipiodol (Guerbet) at a rate of 1:3 (figure 3). Track embolisation was performed with glue-Lipiodol mixture at same ratio used for PVE. The patient was discharged from the hospital in the next day with analgesics prescribed.

OUTCOME AND FOLLOW-UP

Three weeks after the PVE, the patient presented with a vaginal bleeding, and in a gynaecological exam a metastatic biopsy-proven nodule was detected in the posterior wall of the vagina. CT 4 weeks after PVE showed a total functional liver of 1502 g with left lobe volume of 599 g corresponding to 40% of FRL (27% of absolute hypertrophy in the FRL). However, it has detected two new pulmonary nodules. Hence, she had clear signs of progression it was decided to abort surgical therapies.

DISCUSSION

Situs inversus totalis is characterised by a mirror image of situs solitus, in which there is a reversal placement of the abdominal and thoracic structures. Therefore, it results in a left-sided liver, right-sided stomach, left-sided inferior vena cava, right atria on the left side and the left atria on the right side. In this scenario, concordance among organs, vessels and components is generally conserved.¹

PVE is a well-established technique used for patients who require major hepatic resections without sufficient volume of FRL. PVE causes redistribution of portal flow towards the FRL determining hypertrophy of the non-embolised segments.² The mechanism responsible for increased FRL volume is a complex event that causes intense mitotic activity of cells few days after PVE, while atrophy of the embolised lobe is led by hepatocyte apoptosis and sinusoid dilation.³

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Figure 1 MRI postcontrast before portal vein embolisation (PVE) showing recurrence of the lesion in segments V/VIII.

Evaluation of liver volumetry and liver function test are extremely important factors that need to be looked over before performing PVE. Patients with normal liver function, an FRL <20%, are associated with an increased risk of complications after surgery. However, for patients with either hepatic steatosis or significant exposure to hepatotoxic chemotherapy, the goal is FRL >30%. The FRL in patients with Child A cirrhosis is commonly recommended to be higher than 40%.⁴

To our knowledge, this is the first case of PVE in a patient with situs inversus totalis published in the literature. PVE is an important tool in patients who are candidates for extensive hepatic resection without sufficient FRL.

Figure 2 Portography demonstrating reversal position of the right and left portal vein branches.

Figure 3 Glue cast in the right portal vein and branches.

Learning points

- ▶ Situs inversus totalis is characterised by a mirror image of situs solitus, in which there is a reversal placement of the abdominal and thoracic structures.
- ▶ Portal vein embolisation is a well-established technique used for patients who require major hepatic resections without sufficient volume of future remnant liver (FRL).
- ▶ Patients with normal liver function, an FRL <20%, are associated with an increased risk of complications after surgery. For patients with either hepatic steatosis or significant exposure to hepatotoxic chemotherapy, the goal is FRL >30%. The FRL in patients with Child A cirrhosis is commonly recommended to be higher than 40%.

Contributors All authors contributed significantly to the work, and have read the manuscript and approved its submission. IF wrote the paper and performed the procedure. RRS and JHML reviewed the paper and performed the procedure. RFP helped write the paper.

Competing interests None declared.

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