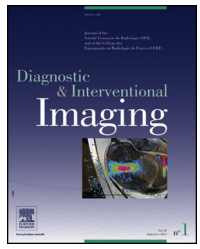
Diagnostic and Interventional Imaging (2015) **96**, 383—386



SHORT ORIGINAL ARTICLE /*Oncology*

Thrombocytopenia due to hypersplenism in oncological disease: Partial splenic embolization during palliative treatment

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KEYWORDS
Partial splenic embolization;
Hypersplenism;
Portal hypertension;
Interventional radiology;
Thrombocytopenia

Abstract Hypersplenism is excess activity of the spleen, resulting in peripheral pancytopenia that predominates in platelet cell lines. Pancytopenia can be limited by reducing the volume of the functional spleen. However, in patients in very poor general condition, a splenectomy may not be possible, due to the risks of surgery and postoperative infection. Another therapeutic alternative in these patients is to reduce the volume of the spleen by super selective percutaneous splenic embolization. We report three cases of peripheral thrombocytopenia due to hypersplenism with a platelet count between 60,000 and 80,000/mm^3, which made it impossible to continue or start a chemotherapy protocol in these patients. For these patients, super selective partial embolization of the splenic parenchyma, with uncharged microspheres (250 microns) quickly resulted in a platelet count above 150,000/mm^3 so that chemotherapy could be continued or initiated.

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Thrombocytopenia is defined as a platelet count below 150,000/mm^3. One of the etiologies is splenic sequestration due to portal hypertension. If drug treatments are unsuccessful, splenectomy is often considered as a last resort to treat refractory thrombocytopenias. However, surgical treatment has both perioperative and postoperative risks [1,2]. Moreover, in patients in poor condition who cannot support general anesthesia, splenectomy is often contra-indicated and dangerous. Partial splenic embolization (PSE) may be an interesting alternative in these cases [3,4]. PSE is a non-surgical procedure performed in the interventional radiology procedure room,

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http://dx.doi.org/10.1016/j.diii.2014.08.005
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which avoids the disadvantages of splenectomy, in particular, the risk of infection. We report three different cases that have the following points in common: all patients had cancer and thrombocytopenia due to hypersplenism making it impossible to begin or continue a chemotherapy protocol. The goal of our study was to describe the role of partial superselective splenic embolization, which rapidly resulted in an acceptable platelet count allowing chemotherapy to be continued or begun in these patients.

Clinical cases

Case 1

A 46-year-old patient had been followed since 2001 for intrahepatic cholangiocarcinoma that had been treated by a right hepatectomy that was extended to segment IV. In 2012, cholangiocarcinoma recurred and was exclusively intraheptatic. Hypersplenism was identified during the initial assessment before treatment was decided, associated with thrombocytopenia with a platelet count of 80,000/mm^3, which was probably secondary to the right hepatectomy. Antiangiogenic treatment was contra-indicated in this patient due to thrombocytopenia.

Because of the patient's general condition, PSE was decided during the pluridisciplinary consensus meeting with the goal of correcting thrombocytopenia to reach a count of more than 120,000/mm^3.

After careful skin preparation and local anesthesia, a femoral approach was taken. The celiac trunk and the splenic arterty were catheterized with a 5F catheter with a cobra head and a flexible guide. Embolization of the branches of the splenic artery was performed at the inferior pole and the middle third with a microcatheter. Uncharged 250 micron microspheres (Embozene, CeloNova BioSciences, headquarters San Antonio, Texas, USA) were used for embolization. Final follow-up showed significant stagnation of the contrast agent in the middle and lower territories of the splenic parenchyma. The patient was hospitalized for 48 hours after the procedure to treat post-embolization syndrome.

Seven days after embolization, control CT showed splenic ischemia of between 50 and 70%, which corresponds to the goals in the literature (Fig. 1) [3,4].

Ten days after embolization, a control visit showed a platelet count of 162,000/mm^3 so that systemic treatment could be begun. The patient presented with left upper quadrant pain for 48 hours after embolization that was successfully treated by morphine, with no other adverse effects reported.

Case 2

A 50-year-old man was being followed for adenocarcinoma of the recto-sigmoïd junction, classified as T4 N1 M0, and which was discovered during investigation of occlusion. Management included subtotal colectomy with an ileorectal anastomosis and lymph node dissection associated with FOLFOX (oxaliplatin, 5 fluoro-uracile, *acide folinique*) adjuvant chemotherapy. At 2 months, unresectable metachronous liver metastases developed. Chemotherapy was modified to a Folfox—Avastin regimen (a total of 23 rounds). The patient then developed portal hypertension with thrombocytopenia and a platelet count of 60,000/mm^3 contra-indicating the use of antiangiogenics and participation in a new treatment protocol. It was then decided to treat the thrombocytopenia with selective PSE. Embolization was identical to that in case 1, with no complications.

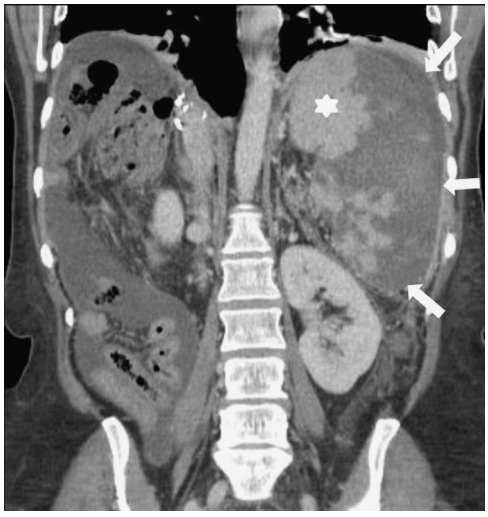

Figure 1. Coronal abdominopelvic CT with contrast injection during the portal phase 2 months after splenic embolization showing splenomegaly with a large unenhanced area of liquid (arrow) representing an area of splenic necrosis. The functional parenchyma is enhanced after contrast injection (asterisk). Ischemia involves approximately 70% of the splenic parenchyma but does not include the superior pole of the spleen to prevent post-embolization pleural reactions.

One month after embolization, the platelet count had reached 200,000/mm^3, so the patient could participate in a clinical trial that included angiogenics. At 2 months, control CT showed spenic ischemia of 50—70% of the parenchyma. At 4 months, the platelet count remained stable at 120,000/mm^3 but secondary pulmonary and vertebral lesions developed causing sleep disturbing pain that did not respond to analgesics.

Case 3

A 42-year-old patient had been followed since February 2012 for an adenocarcinoma of the left colon with synchronous liver metastases. Management included a left colectomy, resection of a left liver metastasis and radiofrequency ablation. Total portal vein thrombosis developed after surgery.

Two months after surgery, recurrent liver metastases and secondary pulmonary lesions developed. Chemotherapy with a Folfiri-Avastin regimen was decided upon. The patient then developed portal hypertension on the thrombosis resulting in hypersplenism with thrombocytopenia and a platelet count of 80,000/mm^3 contra-indicating antiangiogenics and participation in a new therapeutic trial because of tumor progression. PSE was decided upon to reach a platelet count of 120,000/mm^3 and to include the patient in a therapeutic trial.

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