Interventional Treatment on Giant Hepatic Hemangioma Complicated by Arterio-portal Shunt, Massive Ascites and Pulmonary Hypertension

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Objectives:

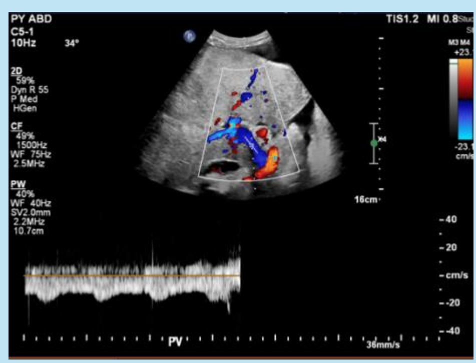
We report a case of a radiologically diagnosed giant hepatic hemangioma associated with arterio-portal (AP) shunts, resulting in severe portal and pulmonary hypertension confirmed both radiologically and clinically. This poster illustrates the interventional treatment, evaluates the safety, efficacy, and clinical outcomes for the patient, and assesses the role of transarterial embolization in alleviating symptoms, closing the AP shunt and size reduction of the hemangioma.

Case illustration:

A 67-year-old woman had a radiologically diagnosed giant hepatic hemangioma complicated by arterio-portal (AP) shunts and severe portal hypertension—manifested as massive ascites, splenomegaly, and partial thrombosis of the portal venous system—along with pulmonary hypertension indicated by an enlarged main pulmonary trunk. Her baseline liver function test and albumin are normal.

Preliminary ultrasound showed the giant hemangioma occupying most of the right hepatic lobe measuring about 12.4 x 16.3 x 17.3cm (TSxAPxCC). A non-occlusive filling defect without internal vascularity was observed in the main portal vein, extending to its bifurcation. Splenomegaly and massive ascites were also evident. The proper hepatic artery was dilated, with abnormal hepatofugal flow.

Giant hemangioma

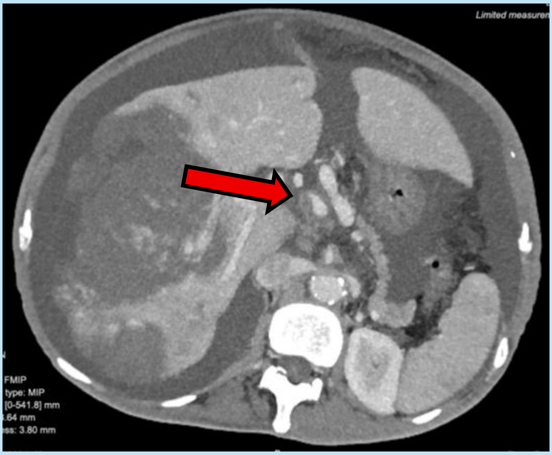


Patent portal vein (PV) with hepatofugal flow

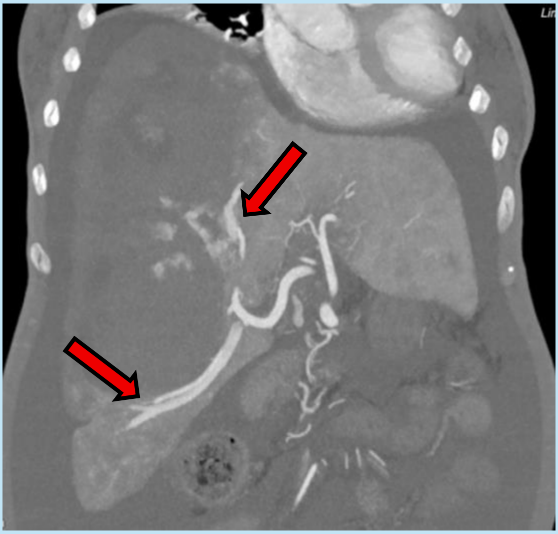
Massive ascites

Partial thrombosed PV

Preliminary computed tomography (CT) revealed findings consistent with the ultrasound, including suspected arterio-portal (AP) shunts. Additional observations included an enlarged main pulmonary trunk, partial thrombosis in the main portal vein and superior mesenteric vein, and complete thrombosis of the left portal vein.

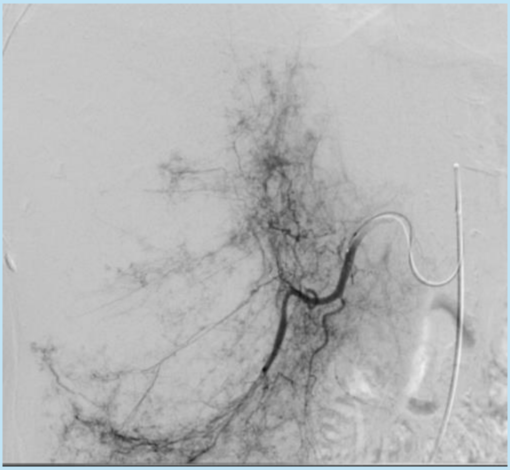


Partially thrombosed main portal vein



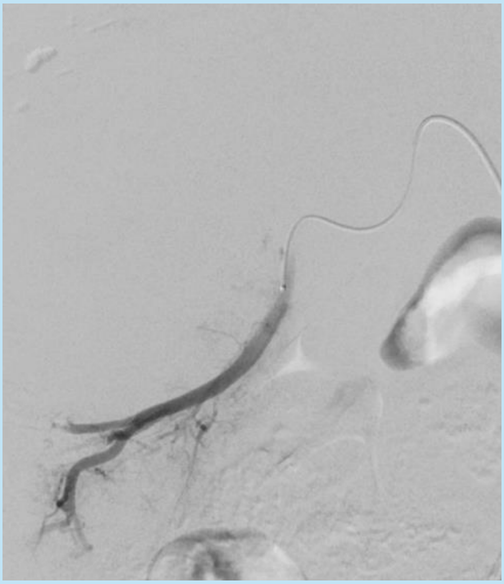
Arterio-portal shunts

Digital subtraction angiography (DSA) of the celiac trunk and right hepatic artery revealed a "cotton wool" appearance with gradual filling of the lesion, consistent with a hepatic hemangioma. Severe arterio-portal (AP) shunts were confirmed, with venous reflux into the main portal vein, splenic vein, and superior mesenteric vein. The AP shunt was complex, likely involving numerous feeders within the hemangioma, with no definite large fistulous point identified on cone-beam CT. The shunt exhibited moderate speed on DSA, with no evidence of arterio-venous shunting to the hepatic veins. The decision was made to prioritize tackling the AP shunt, using superselective embolization of multiple small right hepatic artery (RHA) branches. Transarterial embolization was performed with 500–700 μm Contour Polyvinyl Alcohol (PVA) particles delivered via a 2.6 Fr microcatheter. Due to persistent AP shunting from the proximal RHA with fine feeders observed, further embolization was conducted using 700–1000 μm Contour PVA particles. Follow-up DSA of the superior mesenteric artery (SMA) showed faint re-opacification of the main portal vein with preserved hepatopetal flow.

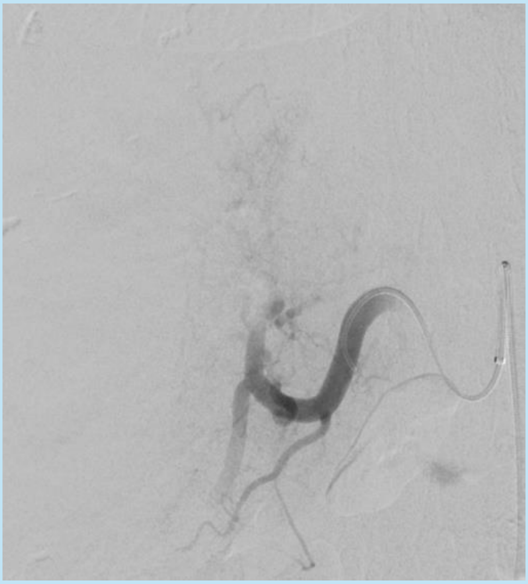


RHA angiogram showed snowy tree sign of the giant hemangioma in the right liver

Early opacification of the portal vein with hepatofugal flow suggested presence of arterio-portal shunts



Embolisation at the lower branch of RHA



Post embolisation of the RHA and the giant hemangioma

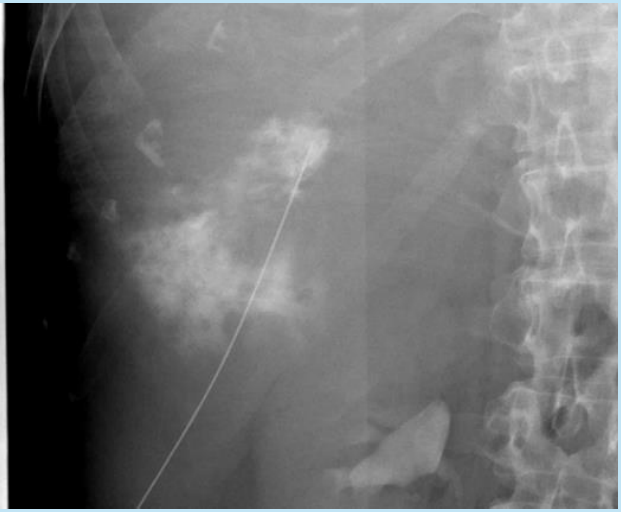
Follow-up CT at three months revealed a significant reduction in ascites, with only trace perihepatic and dependent pelvic peritoneal collections remaining. The partial thrombosis of the main portal vein and superior mesenteric vein (SMV) had resolved, though the left portal vein remained occluded. The resolution of the partial thrombus was likely due to both re-establishment of the hepatopetal flow and anti-coagulation treatment given. Interval digital subtraction angiography (DSA) of the right hepatic artery (RHA) demonstrated a reduced calibre of RHA branches, with attenuation of the branch supplying the superior portion of the right lobe. No recurrence of the arterio-portal shunt was observed, and the main portal vein was patent with antegrade hepatopetal flow. No arterio-venous shunts were identified.

Resolved partial thrombosis of PV and SMV

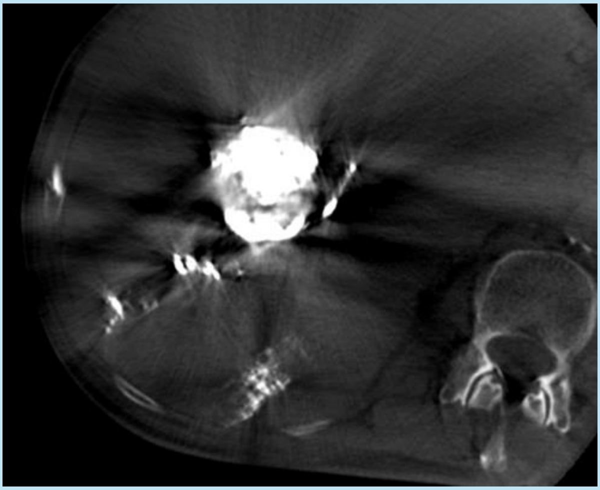
SMA angiogram showed patent PV with normal hepatopetal flow

Percutaneous sclerotherapy was performed for the giant hepatic hemangioma. A 22-gauge Chiba needle was used to puncture the center of the hemangioma under ultrasound and fluoroscopic guidance. Contrast injection was initially performed to exclude opacification of bile ducts or intrahepatic vessels. A sclerosant emulsion (bleomycin and lipiodol) was then injected under real-time fluoroscopic guidance, opacifying the hemangioma and a few vessels within the lesion.

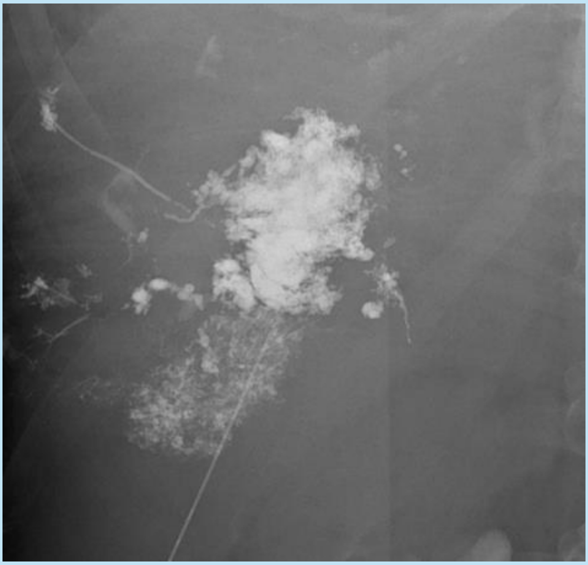
US confirmed 22G needle at the centre of the hemangioma



Contrast injection confirmed no opacification of bile duct or intrahepatic vessels



Cone beam CT confirmed sclerosant within the hemangioma



Post-sclerotherapy opacification of the hemangioma

Discussion and outcome:

Following transarterial embolization (TAE) and percutaneous sclerotherapy, the patient showed significant clinical improvement, reporting resolution of abdominal distension and shortness of breath, and expressed satisfaction with the outcomes. No immediate complications occurred during TAE with Contour Polyvinyl Alcohol (PVA) particles and subsequent percutaneous sclerotherapy of the giant hepatic hemangioma. Minimal post-embolization syndrome (PES) with mild fever for 1 day was observed. There was no deranged liver function. Follow-up imaging and an interventional radiology (IR) clinic appointment in 3 months were scheduled to further assess the patient's clinical symptom improvement, no delayed migration of the sclerosant and short-term safety.

Literature supports TAE as an effective treatment for hepatic hemangiomas by occluding the lesion's blood supply. Similarly, transcatheter arterial chemoembolization (TACE) combines embolization with chemotherapeutic agents, such as bleomycin, pingyangmycin, or ethanol mixed with lipiodol, to enhance efficacy (1,4). Studies report no mortalities and rare severe complications, with only two documented cases of hepatic abscesses, alongside significant lesion size reduction. Medium- and long-term outcomes of TACE with lipiodol-bleomycin emulsion show no mortalities or serious complications, with patients experiencing sustained symptomatic relief and no symptom recurrence during follow-up (1,2).

The co-occurrence of hepatic hemangiomas and arterio-portal (AP) shunts is documented in up to 26% of cases (1). AP shunts typically appear as wedge-shaped or irregularly contoured transient enhancements during the arterial phase on CT, indicative of transient hepatic attenuation differences. Early opacification of adjacent portal vein branches post-contrast injection confirms their presence. In this case, due to presence of fast AP shunts, we decided to use larger size of PVA and not to inject liquid embolic agent via transarterial route. Also, TAE with lipiodol/ sclerosant injection would relatively cause more severe post embolisation syndrome according to the literature. Thus, percutaneous sclerotherapy with bleomycin-lipiodol emulsion was chosen due to multiple AP shunts, minimizing non-target embolization and reducing PES severity (3).

Post-embolization syndrome (PES), the most common complication, presents as influenza-like symptoms, including abdominal pain, fever, nausea, and vomiting, shortly after the procedure. In most cases, paracetamol effectively manages pain, and PES resolves spontaneously. In this patient, PES was minimal and self-limiting, consistent with an expected outcome of TAE (1).

In conclusion, the successful application of transarterial embolization (TAE) and percutaneous sclerotherapy in this patient with a giant hepatic hemangioma and associated arterio-portal shunts resulted in significant symptomatic relief without major complications. The minimal post-embolization syndrome observed was effectively managed, aligning with the favorable safety profile reported in the literature. These interventions, supported by follow-up imaging and clinical evaluation, demonstrate the efficacy and safety of TAE and percutaneous sclerotherapy as a combined approach for managing complex hepatic hemangiomas, offering sustained symptom resolution and improved patient outcomes.

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