

## Preoperative portal vein embolization for Giant Hepatic alveolar echinococcosis

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### ABSTRACT

Hepatic echinococcosis, characterized by tumor-like infiltrative growth, is fatal if appropriate treatment is not undertaken on time. Surgical resection is still the most effective treatment for early stage patients. However, due to asymptomatic progression, many patients miss the opportunity to have the lesion removed. In this paper, we report a new method to treat a patient with giant hepatic echinococcosis. Based on preoperative portal vein embolization of the right portal venous branches, a radical right trisectionectomy of hepatic segment with complete removal of the giant lesion was performed successfully without any postoperative complications. To our knowledge, currently there is no report on the use of preoperative portal vein embolization to treat Hepatic echinococcosis.

**KEY WORDS:** Portal Vein Embolization, Hepatic Echinococcosis, Hepatectomy.

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### INTRODUCTION

Human cystic echinococcosis is a zoonosis caused by the larval cestode *Echinococcus granulosus*. Three alternative therapeutic modalities can be applied in this disease: chemotherapy, surgical resection, and percutaneous drainage. According

to the therapeutic effects, liver resection remains the main treatment for Hepatic Echinococcosis. However, in the majority of cases, liver surgery is contraindicated due to too small future remnant liver (FRL). An alternative strategy which may be curative in the lesion resection is pre-operative portal vein embolization (PVE). Herein, we report the first performance of PVE in a benign patient with liver alveolar echinococcosis to enable radical resection using a right trisectionectomy and received satisfactory outcomes.

### CASE REPORT

A 49-year-old male (73 kg, 172 cm tall) was admitted to our hospital with complaints of right upper abdominal pain and a weight loss of 10 kg within two months. Laboratory examinations results were within normal limits. Pre-operative anti-echinococcal antibodies were present (IgG > 1:256). The plasma disappearance rate of indocyanine green clearance test (ICG R15) was 10.6%. Abdominal ultrasonography demonstrated a 122×115 mm lesion in the right hepatic lobe and a 67×52 mm lesion in the left medial segment of the liver. Abdomen enhanced computed tomography

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Fig.1: CT showing the cystic lesion involving the right hepatic lobe and left hepatic lobe. The arrow shows the portal vein. RL: right lobe, LML: left medial lobe, LLL: left lateral lobe.

scan showed a large heterogeneous lesion with central liquefactive necrosis in both lobes of the liver. (Fig.1). CT-angiography showed no significant intrahepatic vascular involved.

On the basis of cross-sectional imaging, right trisectionectomy was planned as the definitive treatment method. The total estimated liver volume (TELV) was calculated as 1720 cm<sup>3</sup> and the volume of left lateral lobe was 347 cm<sup>3</sup>, considering the patient's body weight was 73 kg, then the FRL to body weight ratio was less than 0.5%, which meant a good respectability would not be achieved in this condition.<sup>1</sup> Therefore, we performed embolization of the right portal vein to promote hypertrophy of the left lobe. An Ultrasound-guided percutaneous transhepatic puncture of the portal vein and embolization of its right lobe branch with coil were performed (Fig.2). There was no evidence of post-embolization syndrome. Four weeks later, abdominal computed tomography (CT) showed sufficient hypertrophy of the left lobe. The volume of left lateral lobe had increased from 347 cm<sup>3</sup> (20% of TELV) to 682 cm<sup>3</sup> (40% of TELV), and the FRL to body weight ratio was increased from 0.475% to 0.934%. (Fig.3)

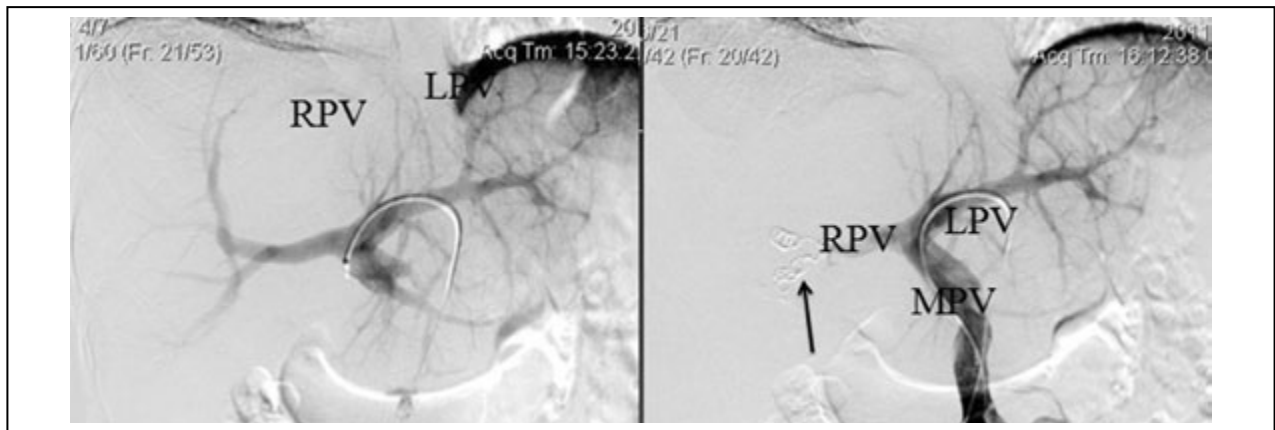


Fig.2: The arrow shows coil in the right branch of portal vein. RPV: the right branch of portal vein, LPV: the left branch of portal vein, MPV: the main portal vein.

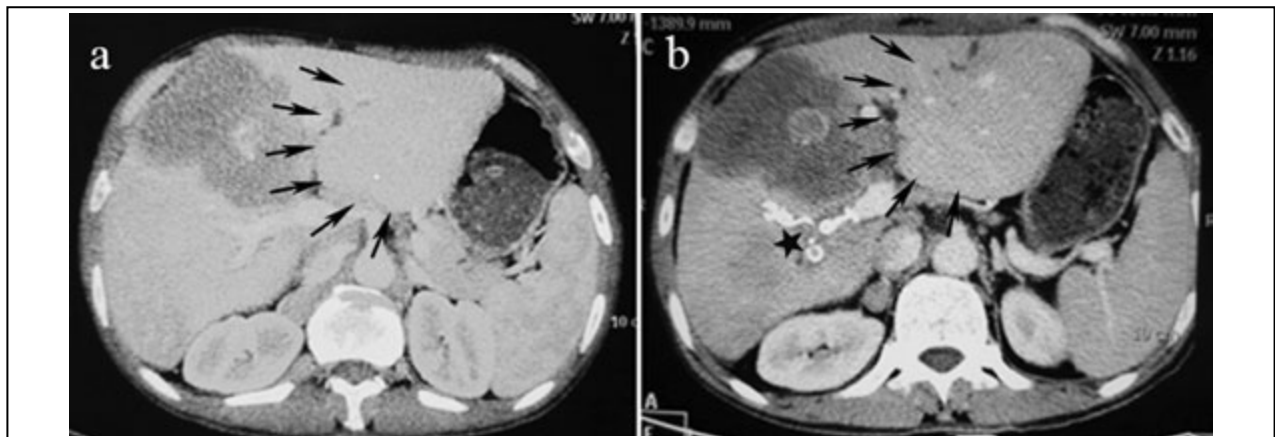


Fig.3: RFL hypertrophy was assessed with comparison of computed tomographic scans obtained before and 4 weeks after PVE (FLR: from 347 to 682 cm<sup>3</sup>). Comparison of the arrow in (a) vs (b) indicates enlargement of the left segment of the liver. The black star in (b) shows high density (coil) in the right branch of portal vein.



Fig.4: It shows the remnant liver volume after right trisectionectomy.

After preoperative preparation with right PVE, right trisectionectomy with bile duct resection and reconstruction was performed. The giant mass was completely resected including segments I\IV\V-VIII. (Fig.4). The mass weight was 1.25 kg with the dimension of 21cm×18 cm×16 cm.

The patient had an uneventful postoperative recovery without any surgical complications. The patient was discharged on the 12<sup>th</sup> day after operation. After six months follow-up, the patient remains well at present.

#### DISCUSSION

Hepatic alveolar echinococcosis is a zoonosis caused by the larval stage of *Echinococcus multilocularis*, which grows primarily in the liver of an infected person and develops as a tumor-like lesion.<sup>2</sup> If alveolar echinococcosis is not treated at the time of diagnosis, the condition may worsen and the patient may ultimately die. Surgery provides definitive treatment for hydatid disease but it is always infeasible for the reason of surrounding structures invasion and intrahepatic metastases. In these conditions, the patients always required a hemi-hepatectomy or an extended hemi-hepatectomy for a radical resection which may be suffered insufficient volume of the future remnant liver (FRL) which is high risk for mortality or morbidity post-operative. In these cases, which performed conservative treatment, partial resection or radiologic interventions, will die within 10 years.<sup>3</sup>

Since the first performance of PVE described by Kinoshita et al.<sup>4</sup> In 1986 for patients undergoing hepatic resection for hepatocellular carcinoma, it has been increasingly used for preoperative treatment of patients scheduled to undergo liver resection when the volume of the future remnant

liver appears to be insufficient, such as bile duct cancer<sup>5,6</sup> and metastatic colorectal cancer.<sup>7</sup> Major hepatectomy after PVE has gained acceptance outcomes during the last decades allowing curative resection for cancer patients with insufficient remnant liver (RL). Here, we report the first performance of PVE in a benign patient with liver alveolar echinococcosis to enable radical resection using a right trisectionectomy. In comparison with other treatments for this disease, the hepatectomy procedure combined with PVE is a new strategy that may increase the number of patients who can benefit from curative resection and offer the hope for cure. Considering alveolar echinococcosis is benign disease, there is no worry about the potential negative side effects of increased growth rate of tumor after PVE in patients with malignant tumor.<sup>8</sup> In conclusion, this is the first time to conduct PVE in a benign tumor patient after which satisfactory outcomes were achieved with well liver function recovery and none postoperative severe complication. Pre-hepatectomy PVE is an available therapy to induce contralateral hepatic hypertrophy for those extensive hepatic resection patients in which the future remnant liver volume is estimated to be insufficient to prevent severe complications.

**Conflict of Interest statement:** All of the authors have no conflict of interest.

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