

Technical considerations in percutaneous hepatic perfusion--a multi-center experience.

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Patients diagnosed with primary or metastatic liver cancer face a daunting future that is complicated by limited treatment options. Percutaneous hepatic perfusion is a novel approach to chemotherapy delivery that offers significant benefits over contemporary modalities. Percutaneous hepatic perfusion is a procedure in which a chemotherapeutic agent is administered at high doses via the hepatic artery where it perfuses the liver, is extracted and filtered using a veno-veno bypass circuit, a fenestrated multi-lumen double-balloon catheter, and two biocompatible hemoperfusion filters. Venous access is gained at the groin through the femoral vein after which the catheter is advanced and positioned in the inferior vena cava just below the right atrium. The catheter's proximal and distal balloons are inflated to occlude the inferior vena cava above and below the hepatic veins. The occlusion isolated the chemo-rich venous outflow of the liver from the systemic venous circulation. This maneuver also diverts venous blood returning to the heart from lower extremities of the azygos vein. Once the patient is on bypass, the agent is infused through the hepatic artery where it saturates the liver. The chemo-rich venous outflow is extracted through the double-balloon catheter by the bypass circuit. The blood is continuously filtered and cleared of the agent as it passes through the filters and returned to the patient through a catheter placed in the right internal jugular vein. A phase I study demonstrated efficacy with an overall radiographic response rate of 30% observed in treated patients. In 10 patients with ocular melanoma, a 50% overall response rate was observed, including two complete responses. The technique is minimally invasive and can be performed safely by a well-trained multi-disciplinary team. It offers significant benefits including multiple procedures without risks commonly associated with open abdominal surgery.