




# A Practical Guide to Inflow Control, Retraction, and Exposure for Robotic Hepatectomy

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**ABSTRACT** Establishment of inflow control and gentle effective retraction of the liver for optimal exposure are critical to safe hepatectomy. Multiple methods have been previously reported for inflow control in minimally invasive (MIS) hepatectomy including Huang's Loop.<sup>1-3</sup> We describe here the assembly and use of our modified version of Huang's loop that permits adjustable, atraumatic, and totally intracorporeal inflow control. We use a soft 16-French urinary catheter with a single premade opening near the blunt tip, across which a small slit is created. A beveled cut is made to the catheter 12–15 cm from the blunt tip and a suture sewn there that can be grasped to pull this beveled tail through the slit and window around the porta hepatis; this loop can be tightened or loosened with ease. For liver retraction, current techniques can be traumatic, especially when instruments apply traction directly onto the liver.<sup>4</sup> Our preferred approach utilizes a liver sling made from a soft, rolled surgical sponge with 15-cm silk ties secured at each end; the length of the sling can be adjusted on the basis of thickness of the liver. The sling applies gentle, atraumatic "pulling" traction and is especially useful for exposure of the right posterior sector. We also use external band retraction to align the transection plane with the camera.<sup>5</sup> Both also provide countertraction when advancing

instruments into a firm or fibrotic liver. These techniques are commonly used in our MIS practice, and we have found them to be cost-efficient, easily reproducible, and effective.

**Keywords** Robotic hepatectomy · Inflow control · Liver retraction · Minimally invasive hepatectomy · Huang's loop · Pringle maneuver

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