

Introduction

Laparoscopic liver resections are becoming a common procedure and bleeding remains the major concern during parenchymal transection. Pringle's maneuver can be performed but ischemic reperfusion injury can lead to postoperative morbidity. Selective hemihepatic inflow control can reduce the severity of visceral congestion and total liver ischemia. During open hepatic resection, the right or left Glissonian pedicle is often dissected and divided en masse extrahepatically before parenchymal dissection. Using these concepts, we describe herein a technique by which each Glissonian pedicle can be easily and safely encircled and clamped during laparoscopic partial liver resection for hemihepatic inflow control.

Operative technique

Under general anesthesia, the patient was placed in a supine position for tumor located in left lobe and in a left semi-lateral decubitus position for right lobe tumor (figure 1). A 10-mm optical trocar was placed in an infraumbilical position by the open method.

After pneumoperitoneum was maintained at 10 mmHg, other trocars were placed. The intraoperative laparoscopic ultrasonography was performed to confirm the size and position of the lesion in relation to the main hepatic structures and to rule out additional lesion (figure 2). After attempting the mobilization, dissection was performed between the hepatic parenchyma and the Glissonian sheath at the bifurcation in the hepatic hilum (figure 3-5). Then the right or left Glissonian pedicle is encircled using the Endo Retractor Maxi and clamped for hemihepatic inflow control (figure 6-8). Parenchymal dissection was performed under laparoscopic ultrasonography guidance and intermittent hemihepatic clamping with periods of 15 minutes of clamping and 5 minutes of unclamping (figure 9-12). Ultrasonic shears can be used in transecting the superficial hepatic parenchyma and laparoscopic Water Jet is useful for isolation of vulnerable vascular structures that are located in the deep portion.

Results

We used this technique in 10 patients who underwent laparoscopic partial resection for liver tumor. In every patients, the tourniquet was prepared uneventfully, regardless of the position of the patient or the presence of cirrhosis. No unsuccessful attempts were made. The tumor size was 4.3 cm (range, 2.5-8.0 cm). Underlying pathology was hepatocellular carcinoma (n=2), metastatic liver tumor (n=6), benign liver tumor (n=2). Mean operative time consumed to achieve complete control of right or left pedicle was 26.5 min (range, 18-46 min). Mean intraoperative blood loss was 150 ml (range, 80-300 ml). There was no complication derived from the placement or the use of the tourniquet. The postoperative course of the patients was uneventful and they were discharged an average of 4.8 days (range, 3-7 days) after the operation.

Conclusions

Safe laparoscopic liver surgery requires knowledge of the regular techniques of vascular occlusion for on-demand use when necessitated to reduce blood loss.

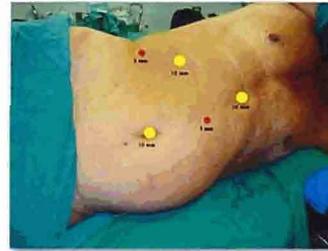


Figure 1: A left semi-lateral decubitus position for right lobe tumor

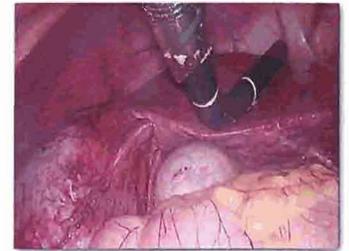


Figure 2: The intraoperative laparoscopic ultrasonographic evaluation for confirming the size and position of the tumor

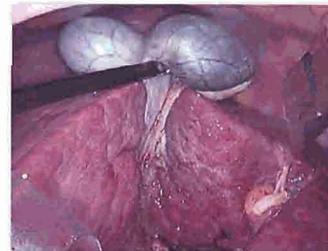


Figure 3: The gallbladder was left in place for liver traction during hilar dissection.

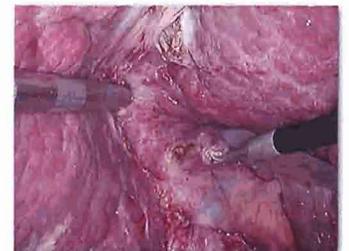


Figure 4: Hilar dissection was performed between the parenchyma and the Glissonian sheath at bifurcation of hepatic hilum.

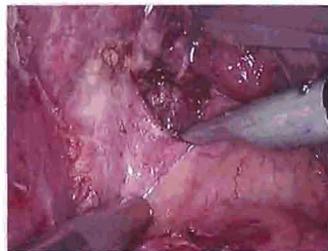


Figure 5: Hilar plate was taken down.

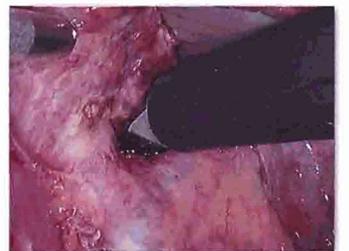


Figure 6: The tip of an Endo Retractor Maxi was gently inserted and extended at bifurcation of hepatic hilum, so the tip of arch was visualized.



Figure 7: The right Glissonian pedicle was extrahepatically encircled by using an Endo Retractor Maxi.

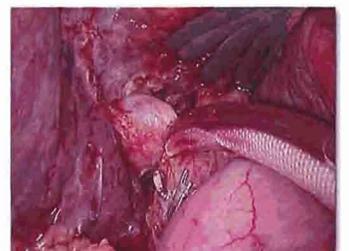


Figure 8: The right Glissonian pedicle was clamped for selective inflow control.



Figure 9: The color of the right liver changed after its pedicle was clamped.



Figure 10: Resecting line of parenchyma was marked.



Figure 11-12: Resected hepatic margin after complete resection.

