

**HBP** SURGERY WEEK 2023

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LV EV 3

# Laparoscopic resection of segment 4 and ventral area of anterior section in cirrhotic liver

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**Lecture** : When a liver tumor is adherent to the middle hepatic vein or located at liver hilum nearby the left and right portal bifurcation central bisectionectomy (resection of Couinaud segments 4, 5, & 8) has been considered the most appropriate surgical approach. By the way, based on the anatomy of ventral-dorsal ramification of the right anterior portal vein, only ventral area of right anterior section can be removed anatomically, leaving portal branches to the dorsal area intact. By this procedure half of the volume of right anterior section can be saved when compared to central bisectionectomy. In this procedure of resection of segment 4 and anterior area, the left resection margin corresponds to the umbilical fissure and the right resection margin is the projected line from the right anterior Glisson pedicle (Figure 1). Particularly, identification of the right resection margin is the core of this surgery. Middle hepatic vein is divided at its root as a last step of this operation.

I'd like to present the surgical techniques of the laparoscopic resection of segment 4 and ventral area and the short-term results.

#### [Materials]

During the period from November 2018 to November 2022, 27 cases of laparoscopic anatomical central hepatectomy was performed. Among them 5 cases underwent laparoscopic resection of S4 and ventral area. Mean age was 62 years (range 48~78 years). All the 5 patients were male. The diagnosis was HCC in 4 and combined hepatocellular cholangiocarcinoma (cHCC-CC) in 1. One patients had 2 tumors on preoperative imaging studies. One was 1.5cm in size and located at liver hilum in between the left and anterior Glissonean pedicles and in proximity to the middle hepatic vein. And the other was 1.8cm in size and located deeply in segment 5/6. RFA was done for the 1.8cm sized tumor in segment 5/6 before the laparoscopic surgery to avoid massive liver resection. Mean tumor size was 2.75cm (range, 1.5 ~ 4.7cm). Underlying liver condition was chronic hepatitis in 2 and cirrhosis in 3. Four patients were positive for HBsAg. Fibroscan was performed in 4 patients. Mean liver stiffness was 6.65 kPa (range, 4.4 ~ 11.8 kPa). Mean BMI was 23.39 (range 21.02 ~ 25.29).

#### [Surgical techniques]

Surgical techniques of laparoscopic resection of segment 4 & ventral area (LLR S4 + ventral area, Figure 1) will be video-presented.

#### [Results]

Mean operation time was 321 minutes (range, 240 ~ 390 minutes). Mean estimated blood loss was 400 ml (range, 100 ~ 600 ml). No patient received blood transfusion. Mean Pringle time was 75 minutes (range, 60 ~ 90 minutes). Pringle time is almost identical to the liver parenchymal transection time. Mean postoperative hospital stat was 7.4 days. There was no postoperative complication or readmission within 60 days.



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#### [conclusion]

Identification of the right resection margin is the core of the laparoscopic resection of segment 4 & ventral area of right anterior section. The area of right parenchymal transection as well as the resected volume is smaller than laparoscopic central bisectionectomy without jeopardizing surgical margin in selected patients. A liver tumor adherent to the middle hepatic vein or located at liver hilum nearby the left and right portal bifurcation is a good indication for this parenchyma sparing operation.

Figure 1

## resection of segment 4 and ventral area of anterior section

