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## Is there a place for microwave ablation under Pringle maneuver for perivascular colorectal liver metastases?: Reponse to “Laparoscopic liver resection for liver tumors in proximity to major vasculature: A single-center comparative study”



### Keywords:

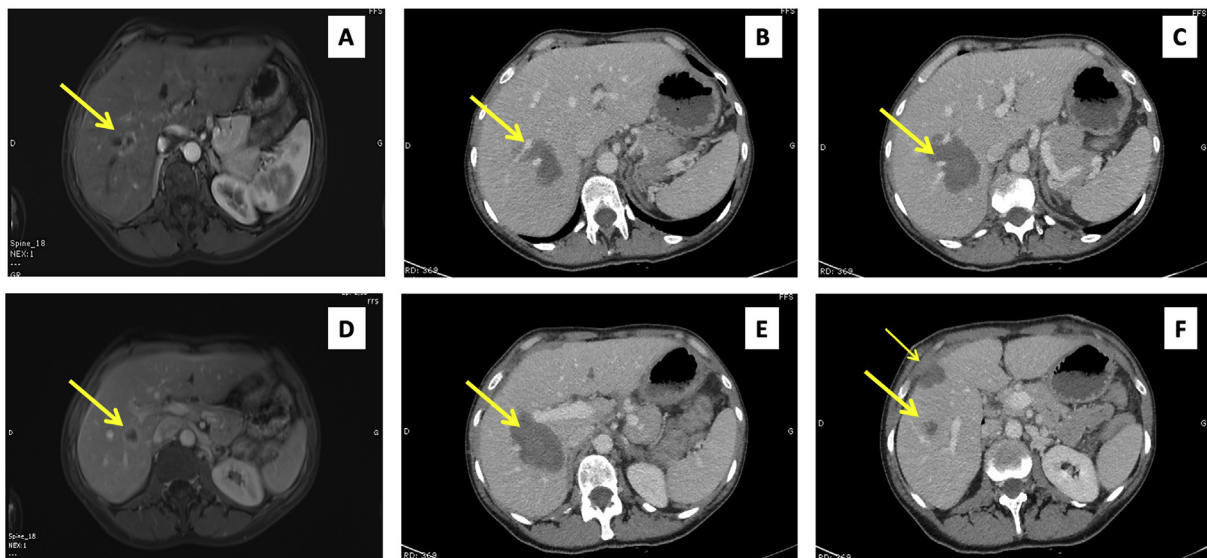
Colorectal liver metastases  
Microwave ablation  
Laparoscopic liver resection

We read with great interest, the recently published study in EJSO by D'Hondt et al. [1], relating to laparoscopic liver resection (LLR) for liver tumors in proximity to major vessels (TPMV). The authors compared the results of LLR in 60 patients treated for TPMV, defined as tumors located within 15 mm to a major vascular structure, to a control group (CG) with tumors distant from major vessels. Blood loss was higher in the TPMV group. Postoperative morbidity was 15% in TPMV group (including 6.7% Clavien Dindo  $\geq 3$ ) and 14.3% in the control group ( $P = NS$ ). Likewise, there was

no significant difference in survival of patients treated for colorectal liver metastasis (CRLM). After a mean follow up of 18 months, overall survival (OS) and disease-free survival (DFS) at 2 years were 71% and 42% respectively, 41% and 42% at 5 years. *In situ* recurrence occurred in 2 patients after R1 vascular resection.

First, we would like to praise the authors for their technical skills in performing such challenging LLR and for the relevance of this study, as the surgical treatment of TPMV is not well codified. Nonetheless, we would like to discuss several points.

Regarding hepatocellular carcinoma (HCC) subgroup, more patients were included in control group (CG) than in TPMV group (22.8% vs 6.7%) and thus, obviously, more cirrhotic patients. In addition, authors identified cirrhosis as the only significant factor inducing more intraoperative blood loss. This might alter blood loss results interpretation in favor of TPMV group. Secondly, concerning intraoperative management, nearly all patients of TPMV group (58/60) had hypovolemic phlebotomy versus 65.7% in the CG, which significantly decreased the central venous pressure



**Fig. 1.** A: Preoperative MRI gadolinium-enhanced T1-weighted sequence: 15mm nodule (yellow arrow) next to origin of right hepatic vein. B/C: Postoperative day 7 CT scan showing ablatative area with perfect patency of origin branches of right hepatic vein. D: Preoperative MRI gadolinium-enhanced T1-weighted sequence: 20mm nodule (yellow arrow) next to portal branch of the right posterior sector. E/F: On postoperative day 7 CT scan, large ablatative area without signs of vascular complication.

(CVP) in TPMV group. This point might also unbalance the results between the two groups and favored the TPMV group.

For CRLM, “Parenchymal sparing” strategy is the gold standard of surgical management [2,3]. Thermal ablation, using radiofrequency or microwave (MWA), for TPMV is still debatable. As discussed by authors, the efficacy of thermal ablation even with MWA devices for TPMV is compromised by the presence of heat sink effect (HSE). Recently, we published our initial experience with MWA under Pringle maneuver for less than 3 cm tumors and located within 5 mm from major vascular structures [4]. We hypothesized that associating (i) interruption of liver blood “Inflow” by hepatic pedicle clamping and (ii) low CVP during liver surgery, will reduce backflow into hepatic veins, both measures minimizing the HSE and enhancing thus the efficacy of MWA for TPMV. This strategy allowed us to avoid major hepatectomies for selected patients (less than 3 cm and TPMV), in perfect fitting with the concept of “sparing parenchyma”, even more than LLR. Our series included resection and MWA under Pringle maneuver. No major complications occurred with only one complication related to MWA (partial hepatic vein thrombosis). The length of hospital stay after exclusive MWA was 4 days.

Particularly during the COVID-19 outbreak, this strategy allowed us to avoid major hepatic resections in selected patients with TPMV. Fig. 1A/D represent a case of two contiguous CRLM of 2 cm diameter in proximity to posterior sectorial portal branches and right hepatic vein. This patient required right hepatectomy as percutaneous MWA would be inefficient. She was finally treated by exclusive laparoscopic MWA under Pringle maneuver. She was discharged the day after surgery. Fig. 1B/C/E/F from postoperative day 7 CT-scan, show a large ablative area without signs of vascular complications. She began her adjuvant chemotherapy 10 days after surgery.

Even if for us, resection remains the standard of care of TPMV, MWA under Pringle maneuver, in selected patients, might represent a valid option with low morbidity and fast access to adjuvant treatments.

### Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

All authors have no disclosures.

### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Available online 9 July 2020