



Use of Transthoracic Transdiaphragmatic Approach Assisted with Radiofrequency Ablation for Thoracoscopic Hepatectomy of Hepatic Tumor Located in Segment VIII

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Abstract

Background Resection of segment VIII remains challenging despite the widespread laparoscopic hepatectomies in past decades,^{1,2} especially for patients with cirrhosis. In this case, we combined radiofrequency ablation (RFA) with transthoracic approach, which was a novel approach for laparoscopic-guided hepatectomy of segment VIII in a cirrhotic patient.

Patient A 42-year-old male patient with a body mass index of 22.0 kg/m² suffered from HBV-related cirrhosis was admitted to our institution. The preoperative MRI showed a 1.3 cm liver mass located in segment VIII. The preoperative AFP is 192 ng/ml. The patient was considered to have hepatectomy using transthoracic transdiaphragmatic approach with the assist of RFA.

Technique The patient was placed in a left lateral position with artificial pneumothorax in the right lung and left side ventilation. Three trocars were placed into the right thoracic space. Transdiaphragmatic intraoperative ultrasonography (IOUS) was performed to confirm the size and location of the lesion. In order to decrease the blood loss during parenchymal dissection and to reach tumor-free margins, the RFA was performed around the tumor before hepatectomy. After that the resection was carried out along the ablative margin. After the specimen was removed, the diaphragm was sutured and a closed thoracic drainage tube was placed. The operative time was 210 min with an estimated blood loss of 50 mL. The postoperative course was uneventful. Antibiotics was used in the first 24 h post-operation to prevent thoracic infection. Drainage tube was pulled out on the fourth day post-operation when we observed the daily fluid volume was less than 100 ml for 2 days and X-ray showed no gases and effusion in chest cavity. The pathology confirmed the diagnosis of hepatocellular carcinoma and the surgical margin was negative. The patient was discharged on the 8th day after surgery.

Li Qin and Liu Fei made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article, they should be regard as the co-first authors. All authors contributed to the design and interpretation of the study and to further drafts.

Li Qin and Liu Fei contributed equally to this study and are co-first authors.

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Discussion Lesions in the postero-superior segments still be challenging as we know.³ Previous studies showed that the procedure's results, such as the blood loss and operative time, were similar between thoracoscopic hepatectomy and laparoscopic hepatectomy, even the former was better.^{2,4} Thus, for the superficial lesions in the postero-superior segments, and not more than 3 cm in diameter, thoracoscopic hepatectomy is recommended. Furthermore, a patient with a hostile abdomen who has a lesion in S7 or S8, transthoracic approach may be particularly helpful. However, functional lung is required due to the unilateral ventilation. Besides, anatomic resections are difficult to perform from the top.⁵ In this case, we used RFA before liver resection, and the tumor cells were destroyed to ensure the negative margin of the cut, and the bleeding blood vessels were also closed. This method can make a significant reduction of blood loss in the patients with cirrhosis compared with conventional hepatectomy (whether through thoracoscopic⁶ or laparoscopic⁷ approach).

Conclusion The novel approach for transthoracic hepatectomy was safe and feasible for lesions of segment VIII in selected patients with cirrhosis,⁸ which was associated with reduced blood loss and a safe surgical margin.

Keywords Hepatectomy · Radiofrequency ablation · Hepatocellular carcinoma

Abbreviations

RFA Radiofrequency ablation

IOUS intraoperative ultrasonography

Supportive Foundations None.

Compliance with Ethical Standards

Ethical Approval Not needed.

Competing Interest No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

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