



## Original Article

# Single-Port Laparoscopic Approach of the Left Liver: Initial Experience <sup>☆,☆☆</sup>



Judith Camps Lasa,<sup>a,\*</sup> Esteban Cugat Andorrà,<sup>a</sup> Eric Herrero Fonollosa,<sup>a</sup>  
 María Isabel García Domingo,<sup>a</sup> Raquel Sánchez Martínez,<sup>a</sup> Harold Vargas Pierola,<sup>a</sup>  
 Aurora Rodríguez Campos<sup>b</sup>

<sup>a</sup>Unidad de Cirugía Hepatobiliopancreática, Servicio de Cirugía General, Hospital Universitari Mútua Terrassa, Universitat de Barcelona, Terrassa, Spain

<sup>b</sup>Servicio de Anestesiología y Reanimación, Hospital Universitari Mútua Terrassa, Universitat de Barcelona, Terrassa, Spain

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## A B S T R A C T

**Introduction:** New technological advances have enabled the development of single-port laparoscopic surgery. This approach began with cholecystectomy and subsequently with other abdominal surgeries. However, few publications on laparoscopic liver surgery have described the use of complete single-port access. We present our initial experience of a single-port laparoscopic hepatectomy.

**Materials and methods:** Between May 2012 and December 2013, 5 single-port laparoscopic hepatectomies were performed: 1 for benign disease and 4 for colorectal liver metastases. The lesions were approached through a 3–5 cm right supraumbilical incision using a single-port access device. All the lesions were located in hepatic segments II or III. Four left lateral sectorectomies and 1 left hepatectomy were performed.

**Results:** Median operative time was 135 min. No cases were converted to conventional laparoscopic or open surgery. The oral intake began at 18 h. There were no postoperative complications and no patients required blood transfusion. The median hospital stay was 3 days. The degree of satisfaction was very good in 4 cases and good in 1. Patients resumed their normal daily activities at 8 days.

**Discussion:** Single-port laparoscopic hepatectomy is safe and feasible in selected cases and may reduce surgical aggression and offer better cosmetic results. Comparative studies are needed to determine the real advantages of this approach.

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\* Corresponding author.

E-mail address: [judcamps@gmail.com](mailto:judcamps@gmail.com) (J. Camps Lasa).

## Abordaje laparoscópico por incisión única del hígado izquierdo: experiencia inicial

### RESUMEN

#### Palabras clave:

Cirugía hepática laparoscópica  
 Cirugía hepática por incisión única  
 Cirugía por puerto único

**Introducción:** Los avances tecnológicos han permitido el desarrollo de la cirugía laparoscópica por incisión única, iniciada con la colecistectomía y usada, posteriormente, para abordar otras enfermedades abdominales. Sin embargo, la cirugía hepática laparoscópica por puerto único es excepcional. Se presenta la experiencia inicial en cirugía hepática por incisión única.

**Material y método:** Entre mayo de 2012 y diciembre de 2013 se intervino a 5 pacientes mediante abordaje laparoscópico por incisión única. La indicación quirúrgica fue por enfermedad benigna en un caso y maligna en 4. Para la colocación del dispositivo de puerto único se practicó una incisión supraumbilical derecha de 3-5 cm. En todos los casos las lesiones estaban situadas en los segmentos II o III hepáticos. Se realizaron 4 seccionectomías laterales izquierdas y una hepatectomía izquierda.

**Resultados:** El tiempo operatorio fue de 135 min. No hubo casos de conversión a cirugía laparoscópica convencional ni a cirugía abierta. La dieta oral se inició a las 18 h. No hubo complicaciones postoperatorias ni necesidad de transfusión sanguínea. La estancia hospitalaria mediana fue de 3 días. El grado de satisfacción fue muy bueno en 4 casos y bueno en uno y los pacientes retornaron a las actividades de la vida diaria a los 8 días.

**Discusión:** La cirugía hepática laparoscópica por incisión única es segura y factible en casos seleccionados y podría aportar menor agresión quirúrgica y mejores resultados estéticos. Se requieren estudios comparativos para determinar las ventajas reales de este abordaje.

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## Introduction

The first laparoscopic liver resection in the world was performed in 1992,<sup>1</sup> and the first in Spain took place in 2000.<sup>2</sup> Laparoscopic liver surgery is a safe and feasible technique,<sup>3-5</sup> however, for years it was used exclusively for minor resections.<sup>6</sup> Greater experience of surgical groups coupled with technological advances have contributed to an expansion of prescriptions for major resections<sup>7</sup> and malignant disease.<sup>8-11</sup>

Constantly advancing minimally invasive surgery and research in NOTES have enabled development of single-port laparoscopic surgery. This is another step toward progress in conventional laparoscopic surgery, and with miniports, further minimizing surgical invasiveness. Its theoretical advantages could be: earlier recovery, less postoperative pain, shorter hospital stay and better cosmetic results. Single-port laparoscopic surgery was first applied to procedures such as cholecystectomy<sup>12</sup> and appendectomy<sup>13</sup> and has subsequently been extended to other fields such as bariatric surgery, colon surgery or splenectomy.<sup>14-16</sup> Its application in liver surgery is reduced today to publications of clinical case series.<sup>17-21</sup>

This is a report on our initial experience in single-port laparoscopic liver surgery where we discuss the technique's feasibility, incision size, postoperative complications, postoperative pain, length of stay, need for blood transfusion, pathological results, satisfaction and return to activities of daily living in patients undergoing this approach.

## Materials and Methods

### Patients

Between May 2012 and December 2013 surgery was performed on 5 64-year-old patients, 3 men and 2 women (27-79 age range). Informed consent was obtained from all patients. Surgical indication was benign disease in 1 case (hydatid cyst) and malignant disease in 4 (hepatic metastases of colorectal cancer). The average number of lesions was 1 (1-2) and 24 mm (7-62) in diameter located in hepatic segments II or III. Patient characteristics are described in [Table 1](#).

### Surgical Technique

Patients were in supine position with legs spread apart and anti-Trendelenburg position. A right supraumbilical transverse incision was performed within the anterior sheath, and anterior rectus muscle laceration was performed to place the single-port device (GelPoint<sup>®</sup> Applied Medical, CA, USA, or Endocone<sup>®</sup> K. Storz, Tuttlingen, Germany). The GelPoint<sup>®</sup> disposable device was used to place 5 ports freely through the gel, and the multichannel and inventoried Endocone<sup>®</sup> device was used to work through its 8 different diameter channels ([Fig. 1](#)). Ten millimeter optics with 30° angle were used. Pneumoperitoneum pressure was set at 12 mm Hg. Intraoperative ultrasonography was performed in all cases.

Four left lateral sectionectomies (segments II and III) were performed and 1 left hepatectomy in 1 case with a 30 mm

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