

Totally Laparoscopic ALPPS Is Feasible and May Be Worthwhile

To the Editor:

We read with great interest the article by Schnitzbauer and colleagues¹ and the excellent editorial by de Santibañes and Clavien in the March 2012 issue of *Annals of Surgery*.² The acronym proposed by Santibañes and Clavien was a breakthrough and, from now on, different procedures using the same principle can be agglutinated under the same acronym—ALPPS, Associating Liver Partition and Portal vein ligation for Staged hepatectomy. Our interest in reading the technique description and its results in this article relates to the fact that we had the opportunity to perform 8 similar cases using the same principles but with some variations in technique and we can now study them as a unique procedure. Another point of interest and concern is the use of a plastic bag around the liver as a solution to avoid adhesions and facilitate the second stage. We believe that this maneuver can be hazardous because sometimes the second stage needs to be postponed because of clinical complications or insufficient hypertrophy of the remnant liver. In some occasions, the second stage may never occur and the patient will need a reoperation to remove the bag. With this in mind, we have used a different strategy—laparoscopy, which we would like to share with the readers.

It is common knowledge that laparoscopy may reduce adhesions.³ Our previous experience with 2-stage laparoscopic liver resection⁴ showed that laparoscopic re-hepatectomy has been greatly facilitated by the lack of adhesions, and it has been possible to use the same trocar incisions.⁴ Therefore, in our last case, we decided to perform the associating liver partition and portal vein

ligation for staged hepatectomy procedure totally laparoscopically. To complete this task totally by laparoscopy, we need 3 steps: resection of the tumor on the left lateral sector, ligation of the right portal vein, and in situ split. All these steps, except in situ split, were previously performed by laparoscopy.⁴ Our previous experience with extended liver resections⁵ stimulated us to perform associating liver partition and portal vein ligation for staged hepatectomy totally laparoscopically on the basis of the advantages that laparoscopy can add to this new approach. This procedure was successfully performed on a 69-year-old woman with multiple and bilobar liver metastases from colorectal origin. Liver volumetry showed a small-for-size future left liver remnant (0.42% left lobe-body weight ratio). In the first stage of the operation, laparoscopic partial resection of segment 3 was followed by ligation of the right portal vein and in-situ split. The liver transection was carried out using a combination of harmonic scalpel and vascular endoscopic stapler. Full mobilization of the right liver was performed in the first stage. Computerized tomography scan at the seventh postoperative day showed an increase of 88% in the future liver remnant (0.8% left lobe-body weight ratio). Second stage was performed on the ninth postoperative day, and only few avascular, easily lysed adhesions were found. Completion of surgery was easily done given that the previous in situ split and right liver had already been mobilized. Division of the remaining liver parenchyma, pedicle, and right hepatic vein were done with a stapler, and the surgical specimen was removed by a previous midline incision. Patient recovery was uneventful.

Associating liver partition and portal vein ligation for staged hepatectomy represents a revolutionary new 2-stage technique and one of the most promising advances in liver surgery over the last decade.² In several centers all over the world, this technique is now being used, and we expect soon a new

report with a larger number of patients to address some uncertain points, such as optimal selection of patients and impact on tumor biology and long-term survival. However, there is still some room for improvement in the technique. We believe that the plastic bag should be replaced by a biological tissue to minimize adhesions and laparoscopy should be more often used. Total or partial use of laparoscopy may be an easy solution for adhesions and difficulties that may be encountered during the second stage. With the use of laparoscopy, second stage can be performed at the optimal time (for the patient) and the surgeon does not need to rush to avoid adhesions. Laparoscopic associating liver partition and portal vein ligation for staged hepatectomy is feasible and may be worthwhile in experienced hands.

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