SCARLESS HEPATECTOMY: NATURAL ORIFICE SPECIMEN EXTRACTION AFTER LEFT LATERAL SECTIONECTOMY

Hepatectomia sem cicatriz: extração do espécime por orifício natural depois de seccionectomia lateral esquerda

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ABSTRACT - Background: The use of laparoscopy in liver surgery is well established and considered as the gold standard for small resections. The laparoscopic resections have lower morbidity and better cosmetic results, but still require an incision to remove the surgical specimen. The possibility of remove the specimen through natural orifices and avoid an abdominal incision may further improve the benefits offered by minimally invasive procedures. Aim: To describe the technique of transvaginal extraction of the specimen after laparoscopic liver left lateral sectionectomy. Method: The laparoscopic liver resection is performed in a standard fashion. After completing the resection, the specimen is placed into a retrieval plastic bag. To perform de extraction, a vaginal colpotomy is performed, guided by a 12 mm trocar introduced through the vagina. Then the extraction bag is removed pulling the bag through the extended incision in the posterior wall of the vagina. After the extraction, the colpotomy incision is closed laparoscopically. Results: This technique was performed in a 74-year-old woman with a 3 cm lesion between liver segments 2 and 3. She had a fast and uneventful recovery. Conclusion: This technique appears to be feasible, safe and avoid the complications of an abdominal incision.

INTRODUCTION

The use of laparoscopy for resection of liver lesions is increasing. This is due to lower morbidity, less postoperative pain, better cosmetic results and rapid return to daily activities with oncological results similar to conventional surgery1-5. Current techniques still require an abdominal incision to remove the surgical specimen. Despite this incision being smaller than the conventional incision, it can still cause pain and prevent complications such as hernia, infection, and a bad cosmetic result6. The possibility of a totally laparoscopic resection with removal of the specimen by a transvaginal route without the need for an abdominal incision can further enhance the proven benefits of laparoscopic liver resections.

The advantages of transvaginal extraction of the specimen has been shown in several case series and retrospective studies in colorectal surgery6-15. There are also reports of transvaginal specimen extraction after gastrectomy, splenectomy, nephrectomy and removal of gynecological tumors13,15,17,18. The use of this technique in liver surgery is likely to show similar benefits.

The objective of this report is to describe the technique of transvaginal removal of the specimen after a left lateral liver sectionectomy (segments 2 and 3).
The patient is placed in the lithotomy position and pneumoperitoneum established with CO₂ pressure maintained at 12 mmHg. Four ports are placed as showed in Figure 1.

**FIGURE 1** - Position of the trocars: In red, the ports used to perform the laparoscopic liver resection; in blue, the extra trocar placed to enlarge the colpotomy.

Initially the cavity should be inspected and the location of the hepatic lesion identified. The left triangular ligament is released until near the trunk of the left hepatic vein. Then the lesser omentum is opened. The transection line located between segment 4 and segments 2 and 3 is marked near the falciform ligament with electrocautery. The parenchyma transection is performed using ultrasonic scalpel until the identification of the intraparenchymal pedicle. The pedicles of segments 2 and 3 should be sectioned with a laparoscopic stapler with vascular load. The transection of the parenchyma continue until the identification of the left hepatic vein which is also sectioned with vascular stapler, completing the left lateral segment resection. After the completing the resection, the specimen is placed into a retrieval plastic bag.

**FIGURE 2** - Puncture site for the vaginal trocar.

The vagina is cleansed using 10% povidone iodine solution. A 12 mm trocar is placed through the space of Douglas in the posterior vagina (Figure 2). The vaginal colpotomy is enlarged to 5 cm in length under laparoscopic view using ultrasonic scalpel, inserted through an extra abdominal 5mm port in the right lower quadrant. The extraction bag with the specimen is gently removed pulling the bag through the extended incision in the posterior wall of the vagina using a grasper forceps (Figure 3). The colpotomy incision is closed laparoscopically with running suture and abdominal trocar wounds are closed in a standard fashion.

**FIGURE 3** – A) The specimen placed into a retrieval bag; B) 12 mm trocar placed through the space of Douglas in the posterior vagina; C and D) the vaginal colpotomy enlarged to 5 cm in length using ultrasonic scalpel; E) grasper used to pull the extraction bag; F) extraction bag being pulled through the extended incision in the posterior wall of the vagina; G) external view; H) specimen after extraction.

**RESULTS**

This technique has been applied to a 74-year-old white woman presenting a 3 cm lesion between liver segments 2 and 3. The tumor was diagnosed during a follow up CT scan after gastric GIST resection. No other lesions were identified and the surgical risk was considered to be low.

The patient had a fast recovery, walking and accepting diet in the same day of surgery. No vaginal complications occurred. She was discharged in the second postoperative day. The pathology report confirmed metastatic GIST.
DISCUSSION

Several reports of surgical transvaginal extraction of the specimen in colorectal surgery are available in the literature 6-15. This technique is safe and easily applied, further reducing morbidity and improving the esthetic outcome in laparoscopic resection.

Ongoing efforts aim to further reduce the surgical trauma associated with minimally invasive procedures. When considering morbidities associated with abdominal wall incisions and cosmetic results, this novel technique may have significant benefits compared with the traditional laparoscopic approach 7,8,10-12,15.

The predicted advantages of transvaginal extraction are reduced pain, a reduced rate of surgical site infection and a reduced rate of incisional hernia, achieved by the absence of reduced dyspareunia. The literature broadly suggests that sexual dyspareunia after transvaginal surgery 8,10,15,16,18. and dyspareunia. The literature broadly suggests that sexual transvaginal route may include an increased risk of infertility 10,15.

All these benefits can also be extended to selected cases of totally laparoscopic liver resection in female patients. When wedge resections, resections of isolated segments or bi-segmentectomies are performed, the specimen can be easily removed by this route.

CONCLUSION

Transvaginal specimen extraction following totally laparoscopic hepatectomy may be a good option for female patients who underwent small hepatectomies. Avoiding an abdominal incision, the postoperative pain and wound-related morbidity can be reduced. This technique appears to be safe, reproducible and present a low complication rate.

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