RELAPAROSCOPY IN THE TREATMENT OF COMPLICATIONS AFTER LAPAROSCOPIC UROLOGICAL PROCEDURES

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Summary.- OBJECTIVES: To propose relaparoscopy as a feasible diagnostic tool and an efficient treatment in early abdominal complications after urologic laparoscopic procedures in selected patients that require surgical intervention.

METHODS: Between January 2008 and April 2011, a total of 246 laparoscopic urologic procedures were performed at our institution. There were 81 radical nephrectomies (33%), 46 radical prostatectomies (19%), 31 pyeloplasties (13%), 28 partial nephrectomies (11%), 6 radical cystectomies (2%) and 54 miscellaneous (22%).

Mean age was 53 years (range 15 to 84 years). Male / female ratio was 2.4:1. Patient’s ASA score was 1, 2, 3 and 4 in 48%, 44%, 7.5% and 0.5% respectively. Mean postoperative stay was 2.7 days (range 1 to 8 days).

RESULTS: A total of 4 patients (1.6%) developed severe abdominal complications that required surgical intervention. All cases were reoperated laparoscopically. Mean operative time was 57 minutes (range 40 to 80 minutes), and mean hospital stay was 3.7 days (range 3 to 5 days). All patients evolved uneventfully and did not require further treatment.

CONCLUSION: Surgical complications secondary to laparoscopic urologic procedures can be safely reoperated by means of laparoscopy especially in hemodynamically stable patients.

Keywords: Laparoscopy. Relaparoscopy. Urology. Complications.

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An ever-growing number of urologic procedures are now a day being done laparoscopically due to the large number of centers worldwide that perform these techniques. Although mobility has significantly decreased for these procedures in the last decade, the laparoscopic approach is not exempt of complications. The increasing number of surgeons undertaking laparoscopic urology correlates with a direct increase in surgical complications, however, there is no standardized treatment for these occurrences (1).

Open surgery has been the standard approach when reoperation was warranted. Thanks to the accumulated experienced of some surgeons the laparoscopic approach is currently accepted as a safe and feasible option in some cases (2). By choosing a laparoscopic approach for the resolution of postoperative complications, the benefits of this modality are not lost such as less postoperative pain, decreased ileus, shorter hospital stay and decreased convalescence with better cosmetics results (2,3).

Numerous authors have already advocated relaparoscopy as a safe technique for the treatment of postoperative complications secondary to laparoscopic cholecystectomy (4). Also there have been some reports in the setting of laparoscopic colectomy (3). It is reasonable to understand why many urologists have also opted for this approach for the resolution of surgical complications secondary to laparoscopic surgery. In spite of the few reports found in the literature, there is no published analysis of this occurrence.

Herein we report our experience in the treatment of abdominal complications secondary to urologic laparoscopic procedures by means of laparoscopy. We propose relaparoscopy as a feasible and safe alternative in the setting of surgical intervention in selected patients.

MATERIAL AND METHODS

Between January 2008 and April 2011, a total of 246 laparoscopic urologic procedures were performed at our institution by the first author or by the resident in training under his supervision.

There were 81 radical nephrectomies (33%), 46 radical prostatectomies (19%), 31 pyeloplasties (13%), 28 partial nephrectomies (11%), 6 radical cystectomies (2%) and 54 miscellaneous.

Mean patient age was 53 years (range 15 to 84 years). The male / female ratio was 2.4:1. Patient’s ASA score was 1, 2, 3 and 4 in 48%, 44%, 7.5% and 0.5% respectively. Mean postoperative stay was 2.7 days (range 1 to 8 days).

Out of the total 246 patients, 4 (1.6%) developed severe abdominal complications that warranted early surgical intervention (during the first 7 postoperative days). All cases were reoperated laparoscopically by the first author. Demographic data in Table I.

RESULTS

All 4 cases were managed successfully by means of laparoscopy without the need for open conversion or hand assistance. Initial trocar layout was respected by introducing the ports through the primary incision. Mean operative time was 57 minutes (range 40 to 80 minutes). Mean postoperative hospital stay was 3.7 days (range 3 to 5 days). No case required a second reoperation. There was no mortality in the series. Cases are summarized on Table II.

Case 1

A 35 year old male patient with ureteropelvic junction obstruction underwent laparoscopic transperitoneal pyeloplasty uneventfully. The patient evolved with a steady and high hematic drainage output during the first 48 hs. On day 2 an acute abdomen with hemodynamic changes (blood pressure

under 100/60 mmHg and heart rate over 100 / min] prompted relaparoscopy. Before deciding surgery, the patient had undergone blood transfusions with partial response. After the abdominal cavity had been thoroughly washed there was no apparent bleeder. However, a very small pelvic vessel that was thought to be responsible was easily controlled with the harmonic scalpel (Ethicon Endosurgery). Operative time was 60 minutes. The patient required transfusion of 4 units of blood and was discharged three days after relaparoscopy.

**Case 2**

A 44 year old male with a history of diabetes, high blood pressure, morbid obesity and left open partial nephrectomy was seen for a left kidney recurrence of 6.5 cm. The patient underwent laparoscopic radical nephrectomy, surgery was difficult due to an important adhesion to the spleen. Final pathology reported a 6.5 cm clear cell renal carcinoma (CCCR), Furhman 2 with renal vein invasion, pT3a. During the immediate postoperative period the patient started becoming hemodynamically unstable with no response to ev expansion, forcing surgical re-intervention after 8 hours. A sub-aponeurotic hematoma along with a bleeding vessel was found on the incision through which the surgical specimen had been extracted. After all blood clots had been removed, the incision was explored and re-sutured. Operative time was 80 minutes. The patient required transfusion of 2 units of blood and was discharged on postoperative day 4.

**Case 3**

A 47 year old male patient with a history of high blood pressure and morbid obesity was incidentally diagnosed of a 3 cm right renal mass. The patient underwent laparoscopic partial nephrectomy. Pathological analysis showed a 3.6 cm CCRC, Furhman 1, pT1a. While recovering from anesthesia the patient’s blood pressure peaked to 200 / 120 mm Hg, immediately drainage output started to increase. With a persistent drainage output (500 ml in less than 3 hours) and a patient that was starting to become hemodynamically unstable (no response to ev cristaloids), endovascular embolization was undertaken five hours after surgery. After five hours the patient was immediately taken to the OR for further exploration due to severe hypotension and increase drainage output (100 ml/hour). During laparoscopic abdominal exploration it became clear that the bleeding was persistent and the kidney was beyond repair. Laparoscopic radical nephrectomy was performed. Operative time was 40 minutes. The patient was discharged on postoperative day 5.

**Case 4**

A 68 year old female patient underwent laparoscopic partial nephrectomy for a 3.3 cm left renal tumor. Pathology reported a 3.3 cm CCRC, Fuhrman 2, pT1a. A couple
of hours after surgery the patient was seen with persistent high drainage output (450 ml in 3 hours). An angiography was performed showing a small bleeding vessel on the cut surface of the parenchyma. Selective embolization was performed with excellent results shown by radioscopy. However, the patient evolved with persistent bleeding (75 ml / hour) and gradually became unstable. Laparoscopic abdominal exploration was undertaken after 7 hours of initial surgery and left radical nephrectomy was performed. Operative time was 50 minutes. The patient evolved uneventfully and was discharged on postoperative day 3 without the need of a transfusion.

**DISCUSSION**

The benefits of using laparoscopy for the resolution of complications associated with a previous laparoscopic surgery are evident. Avoiding open surgery preserves the benefits of this modality such as less postoperative pain, decreased ileus, shorter hospital stay and decreased convalescence with better cosmetics results [2,3]. As previously mentioned there are some publications regarding relaparoscopy in the setting of laparoscopic cholecystectomy and colectomy, nevertheless there are limited reports concerning urolaparoscopy [3,4]. Even though the use of laparoscopy has expanded, there is still a very well defined area for conventional laparotomy. Laparotomy is still preferred when the patient is thought to have a life threatening hemorrhage in which no time can be wasted and the benefits of laparoscopy have to be weighed against the risk of death (5-9). Also bowel lesions may warrant for thorough washing of the abdominal cavity, this may be difficult laparoscopically and some intestinal lesions may be missed (4-6,8,9).

It is worth mentioning that relaparoscopy usually requires specific patient positioning that is time consuming and may delay surgical access. Also in the event of conversion to open surgery the patient may again need repositioning wasting valuable minutes. It is clear then that not all settings are suitable for a minimally invasive resolution, and the laparoscopic approach has to be thought as one more alternative in the surgeon’s armamentarium [3]. There are no guidelines regarding the use of laparotomy versus laparoscopy for the solution of urological surgical complications. Given the wide range of circumstances it is up to the surgeon’s best knowledge to choose the most safe and convenient resolution. During complication the urologist must be expedite even though some times this may require the use of laparotomy or the loss of an organ. In this type of surgery the main objective is to guarantee the life of the patient (10,11). Most surgeons are more familiar with the open approach and feel more comfortable using a laparotomy for the treatment of surgical complications.

In our report, two of the cases were secondary to laparoscopic partial nephrectomy. In both cases a bleeder was identified on the cut surface of the kidney, nevertheless embolization was futile and radical nephrectomy was performed to avoid further morbidity to the patient. In both cases we chose to avoid a second suture over the bleeder considering this would not be a safe option and would not guarantee a definite solution. In none of these cases we attempted local hemorrhage control, we believe this to have unpredictable results. There are published cases in which local control was possible, nevertheless in our cases we believed this option to be unreliable (10,11). In this cases the loss of the organ has to be weighed against the possibility on a second postoperative hemorrhage, which may leave the patient in a very delicate situation. Renal trauma is not frequent in our institution, and this may have played a significant role in the decision process.

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**Table II.**

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age</th>
<th>Sex</th>
<th>ASA</th>
<th>Operative time</th>
<th>Blood transfusion (RBU)</th>
<th>Hospital stay (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35</td>
<td>M</td>
<td>1</td>
<td>60 min</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>44</td>
<td>M</td>
<td>2</td>
<td>80 min</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>47</td>
<td>M</td>
<td>1</td>
<td>40 min</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>68</td>
<td>F</td>
<td>2</td>
<td>50 min</td>
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<td>3</td>
</tr>
<tr>
<td>TOTAL</td>
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<td>-</td>
<td>-</td>
<td>57.5 min</td>
<td>1.5</td>
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</tbody>
</table>
due to our absence of experience in the conservation of renal units at risk of secondary bleeding. In the second case laparoscopy proved to be very efficient. Even though bleeding came from the incision through which the organ had been extracted, exploration of the whole abdominal cavity was possible without the need for an open approach.

Finally the benefits of a minimally invasive approach must not be put before the safety of the patient. It will be up to the urologist best judgment which surgical approach to use in the setting of a complication secondary to a laparoscopic surgery. Currently there are no reviews dealing with this matter, we believe new experiences will produce guidelines that will ease the decision making process.

In our experience the laparoscopic approach of surgical complications secondary to laparoscopic urologic procedures proved to be feasible and safe, opening the door for a future standardization of this technique. However, this small experience is not enough to validate any type of therapeutic strategy.

**CONCLUSIONS**

In selected cases, surgical complications associated with laparoscopic urologic procedures may be treated by means of laparoscopy, particularly in stable patients that require abdominal exploration for persistent bleeding. By using laparoscopy the clear advantages of this technique are preserved. However, the decision has to be tailored to each patient using good surgical judgment and favoring the patient safety.