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Editorial

Comments on article “Hand-assisted laparoscopic nephrectomy”

Comentario editorial al trabajo “Nefrectomía laparoscópica asistida por la mano”

The establishment and development of laparoscopic surgery in urology has revolutionized the surgical techniques used in this specialty. Initially used mostly for renal surgery, the advantages of this modality, compared to classic surgery, are clear: less postoperative pain, lower rate of complications in the surgical wound, faster return to normal daily activities, and better esthetic outcomes.

At first, the oncological safety of the technique was questioned due to the development of metastases at the ports and peritoneal seeding in patients undergoing surgery for gynecological tumors in which the piece was morcellated prior to removal, or in patients with a high-grade urothelial tumor in whom the piece was extracted without using an extraction bag^{1,2}. A number of current studies demonstrate the oncological safety in most tumors if certain safety standards are followed (using a bag to remove the piece, not morcellating the piece, and avoiding manipulation that could rupture the tumor). For clear cell renal cell carcinoma specifically, the vast majority of cancer centers consider laparoscopic management the gold standard for T1 and T2 tumors.

On the other hand, the main limitations of the laparoscopic technique stem mainly from the two-dimensional vision (a problem solved recently by the development of robotic surgery, which at the moment is extremely expensive and whose use in a public healthcare system such as Spain's is controversial); the need to work through “ports”, which reduces the range of movement; the excessive dependence on technology for creating instruments (which are increasingly ergonomic and offer a wider range of work positions); and last but not least, the surgeon's loss of the sense of touch, which is of paramount importance in surgery. This problem was solved in the nineties with the development of a technique that can be considered intermediate between “pure” laparoscopy and classic surgery: hand-assisted laparoscopic

surgery. As mentioned above, a system was developed that permitted the introduction of one hand without loosing pneumoperitoneum gas; additionally, increasingly powerful insufflators that minimized this loss were created. By working with a hand inside the abdominal cavity, the brain receives a visual reference that overcomes the difficulty of working in two dimensions. Furthermore, the surgeon regains the sense of touch in the surgical field, which is useful for dissection, identification of blood vessels and other structures, etc. Moreover, using one's hand facilitates the task of separating the viscera, which is necessary in order to prepare the surgical field (the various laparoscopic separators are usually of a rather limited design). Finally, vascular injury—the most feared complication of this kind of surgery—can be managed better if the surgeon's hand is inside the field, which allows for the very valuable time necessary to implement the best measures to solve the problem.

However, the hand-assisted technique does have some disadvantages. In some cases it is difficult to work with one's hand inside the limited space in the abdomen (depending on the size of the piece and of the abdomen itself) and to place the ports because the systems to introduce the hand are quite large (although the external diameter of the latest systems has become smaller). In our experience, fine dissection is more difficult because it is done with his dominant hand, the other used mainly to move the viscera away from the surgical field. One of the advantages of pure laparoscopy is that the incision used to remove the piece is made at the last moment and closed immediately; conversely, with the hand-assisted technique the hand is in permanent contact with the device throughout the intervention, which may increase the risk of surgical wound infection; some studies, however, do not show a higher rate of incision complications.

The indications and contraindications of the technique have changed with time, as experience with laparoscopy grows and new materials are developed by the industry. The article by the Hospital Virgen de la Arrixaca group published in this issue, entitled "Hand-Assisted Laparoscopic Nephrectomy in Difficult Cases", reports the experience with cases for which this technique is traditionally considered an absolute or a relative contraindication, such as renal tumors with venous thrombosis, large kidney masses, renal inflammation, or a history of prior abdominal surgery³.

A history of major abdominal surgery is not really a contraindication for transperitoneal pure laparoscopy, although opting for the lumboscopic route may yield different outcomes. This route is clearly underutilized in our country because of the difficulties it entails: a smaller work area, more anatomical disorientation, and a more difficult placement of trocars. In our experience with almost 500 retroperitoneal interventions, of which approximately 25% were in patients with a history of abdominal surgery, no reconversion has occurred so far due to that history. It is true that these are patients in whom the generation of the pneumoperitoneum and the introduction of trocars are more difficult because adhesions may be present in the surgical field, which induces us to perform these steps more cautiously, and that in some cases we cannot work with the ports placed in the preferred locations.

Manipulating large pieces (tumors or even whole kidneys, as in cases of polycystic kidney) may be difficult with pure laparoscopy. I believe that the 10-cm limit for tumors can be somewhat increased, depending on the location and the percentage of the tumor protruding from the renal silhouette. The surgical approach may vary depending on whether the tumor is located on the upper pole, the middle, the inferior convexity, or in the center of the kidney protruding from the midline. In these cases, inserting one's hand can help to locate the hilus of the kidney and to separate the piece; however, in small abdominal cavities not distended very much by the pneumoperitoneum, it is difficult to insert one's hand; size also determines where the trocars are placed.

There is literature about cases of tumor and level I venous thrombosis and their management with pure laparoscopy and the thrombus "squeezing" maneuver, which allows for a long enough segment of the renal vein long enough to clamp and cut^{4,5}. In our experience, the classic laparoscopic approach can be done in these cases, and hilar dissection is somewhat more laborious. When the tumor thrombus exceeds the renal ostium and involves the wall of the vena cava, it is too risky to attempt a laparoscopic approach, even if it is hand-assisted; there are, however, reports of cases in which this has been done⁶⁻⁹. In these cases the benefits to the patient from this approach should be assessed and compared to the major risk of vascular complications such as a lateral opening of the vena cava, which is difficult to manage with laparoscopy. Doubtlessly, this type of intervention should be used in hospitals with wide experience with laparoscopy.

Finally, in cases with important perinephric inflammatory reaction, laparoscopy is very limited by the surgeon's loss of

the sense of touch. Prior renal surgery (for lithiasis, cancer, etc.) makes laparoscopic surgery more difficult, but it should not be a contraindication if performed by experienced professionals. Patients with suspected xanthogranulomatous pyelonephritis are a special case. In them, it is difficult to develop anatomical planes, and there is a potential danger of vascular and intestinal injury that may be unnoticed and which implies risks in the immediate postoperative period. This situation is probably one of the few cases in which we do not consider laparoscopic surgery to be the first option. Perhaps a hand inside the surgical field in hand-assisted laparoscopy has advantages in these cases, but like tumors with thrombus in the vena cava, the surgical risk must be weighted against the expected benefits.

In conclusion, I believe that surgeons should use the approach with which they feel more comfortable, but exercise common sense and not stretch the indications, which are often dependent on the experience of each hospital. The lumboscopic approach has not been developed much in our country, and might be useful in some cases in which we use the transperitoneal route. The hand-assisted laparoscopic technique is useful in many cases, and constitutes an intermediate step towards pure laparoscopy; it should, however, not be underestimated for complex cases or reconversion during classic laparoscopy.

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