SUPRAMESOCOLIC ACCESS TO THE LEFT RENAL PEDICLE: ANATOMICAL AND SURGICAL DESCRIPTION


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Summary.- OBJECTIVE: To expose and remind the supramesocolic approach to the left renal pedicle, in addition to review its main indications.

METHODS/RESULTS: We perform a detailed description of the surgical technique showing its indications, the position, the incision and retraction systems employed, detailing the steps followed during dissection.

CONCLUSIONS: Adequate vascular control and complete resection of large renal and adrenal masses require an adequate exposition; the knowledge of surgical techniques such as supramesocolic approach to the left renal pedicle is very useful and may ease the course of retroperitoneal operations avoiding complications and giving comfort in a frequently difficult operation.

Keywords: Surgical technique. Renal pedicle. Anatomy.

Resumen.- OBJETIVO: Exponer y recordar la vía de acceso supramesocólica al pedículo renal izquierdo, además de recordar las principales indicaciones de la misma.

MÉTODO/RESULTADOS: Realizamos una descripción detallada de la técnica quirúrgica exponiendo sus indicaciones, la posición, incisión y sistemas de retracción utilizados y detalando los pasos llevados a cabo durante la disección.

CONCLUSIÓN: El adecuado control vascular y la resección completa de grandes masas renales y suprarrenales precisan de una adecuada exposición; por lo que el conocimiento de técnicas quirúrgicas como el acceso supramesocólico al pedículo renal izquierdo es de gran utilidad y que puede facilitar el curso de cirugías retroperitoneales evitando complicaciones y aportando comodidad a actuaciones con frecuencia comprometidas.

INTRODUCTION

Urologists surgical approaches have been used historically in a traditional way with discrete changes and developments aimed at obtaining greater patient comfort.

The excision of large masses is a challenge for any urologist, who, when faced with situations that do not conform to the usual technique, as in certain pathologies located in the left upper quadrant of the abdomen, should know all the possible ways of surgical approach that guarantee adequate exposure to successfully address these masses.

The main objective of this paper is to present and remember the path to the left renal pedicle supramesocolic, in addition to remember the main indications of it.

ANATOMY OF THE UPPER LEFT QUADRANT ABDOMINAL

For carrying out general descriptions of four quadrants defined abdominal cavity defined Transumbilical plane in transverse direction and in the longitudinal median plane. The first one passes through the navel (L3- L4 intervertebral disc) and divides the abdomen into upper and lower halves, while the second passes through the body and longitudinally divided into left and right.

In the upper left quadrant (CSI) found the spleen at the level of lateral costal margins ninth, tenth and undécimo, posterior and lateral to the stomach and pancreas and cranial to the splenic flexure. It is attached by the gastro - splenic ligament (which attaches to the greater curvature) and splenic - renal ligament (which attaches to the upper pole of the kidney). Splenic artery, from the celiac splenic hilum reaches through the front face of the pancreas. This artery supplies the body of the pancreas and the greater curvature of the stomach. Venous drainage is through the splenic artery to the mesenteric vein and the portal vein is a 1.

TECHNICAL DESCRIPTION

Indications

There are clear indications initial direct access to the vascular elements of the kidney and adrenal gland:

1. Large Renal Carcinoma
2. Large adrenal mass, pheochromocytoma is special.
3. Surgery for renal artery revascularization
4. Severe trauma (vascular control)

In the case of renal carcinoma initial ligation theoretically prevents renal pedicle hematogenous tumor dissemination during surgical manipulation, tumor volume decreased by depletion of blood and promotes the decrease in the size and density of newly formed vessels neovascular fed by the artery after control.

As we boarded the adrenal gland, initial ligation main adrenal vein is a priority in tumors such as pheochromocytoma to prevent discharge adrenal intraoperative manipulation (2).

Although most renal injuries do not require surgical treatment, supramesocolic approach is a fast track access and useful in controlling arterial bleeding in penetrating renal trauma.

This route is described below mainly used to control mesenteric arterial trunks, being of great importance in controlling vascular during transplantation.

Position, incision and retraction systems

The patient is placed supine in slight anti-Trendelenburg position, rollers on the base of the chest and under the left buttock with a slight shift to the right. Rochard separator exposure favors subdiaphragmatic area because its leaflets raised cephalad rib edges and laterally flatten the domes (Figure 1).

The approaches that are commonly used are unilateral or bilateral subcostal incision (Chevron) to obtain adequate access to the upper pole of the kidney or adrenal gland, and increased space in the subdiaphragmatic area. This incision can be extended vertically on the midline to the xiphoid apophysis, so if it is necessary to extend the incision into the chest, this last line can join a theoretical average thoracotomy incision.

The incision xifopubiana, in the case of large or injuries that require access to a wide vena cava cavotomy provide great exposure, but sometimes, as in obese patients is generated telescoping effect (decreased exposure to deepen the field).

Toracofrenolapathomy increases the morbidity, precise placement of a trocar and accurate, most postoperative analgesia.
Dissection

Dissection begins with the opening of the lesser sac (Figure 2), cutting the gastrocolic omentum and was rejected greater curvature up and down gastric mesocolon transverse and descending, making an incision in the tissue 1 cm from fibroareolar pancreas lower edge allowing its upward movement with the posterior midgut, immediately into contact with the aorta and with an element that cuts across its front face and is the left renal vein thick. The surgical field is broad, but deep, and allows control of the left renal pedicle and the main adrenal vein.

To reach the lower edge of the pancreas and into the lesser sac can make avascular dissection plane colo-omental or frank dissection quick gastrocolic omentum from the midline to the left with type hemostatic elements Ligasure®. At the lower edge of the tail of the pancreas is located inferior mesenteric vein, which can be linked or referenced, on its way to the splenic vein.

Covered by a thin sheet is attached to the posterior parietal peritoneum tail and body of the pancreas. The incision begins at the midline to the left to 1 cm from the bottom pancreatic coagulating small vessels and allowing an easy dissection of the posterior wall structure. This release allows you to reject the midgut and, together with the pancreas, easily moving upwards. The tail of the pancreas crosses the anterior left kidney at the level of the upper room, but with variations in length and volume can reach to the outer edge of the kidney or just enter into relationship with the anterior lip of the renal hilum. Once the pancreas has been released and turned upwards by loose areolar tissue formed by the backsheet and downstream of the bag and fascia mesogástrica prerenal LRV appears across the anterior side of the aorta (Figure 3). The contact with the aorta allows access to the left renal vein and its branches, especially the main adrenal vein.

Like via inframesocólica now access the duodenojejunal and Treitz muscle section allowing release of the posterior wall and the complete detachment of the block which is rejected duodenopancreático forward with the superior mesenteric artery (maneuver Kocher left).

Figure 1. Bow and Rochard leaflet. Exposure of the abdominal cavity with the transverse colon and the greater omentum or gastrocolic omentum.

Figure 2. Entry into the transcavidad of the omentum.

The left renal vein is a thick trunk across the anterior transverse aorta. Dissection enables its collateral ligation are usually one or two veins gonadal and adrenal vein (if easily controllable adrenal tumors) and is now very easy to locate the left edge of the aorta to the renal artery. Should radical nephrectomy ligation and section of the artery and then the vein which extends the surgical field.

Finally renal cell is released upward, including if necessary the adrenal gland and making
contact with the muscle extrafascial quadratus. The left angle decrease for large colon kidney tumors bottom facilitates release of the renal cell. This maneuver is not needed in small tumors, thin patients and when the colon and left meso shift easily.

The operation ends with a review of hemostasis, drainage and closure of the abdominal wall.

**DISCUSSION**

In the case of renal carcinoma, the established surgical treatment is radical nephrectomy, including the kidney together with the perirenal fat and sometimes the suprarenal gland together with the regional lymph nodes (at least the hilar nodes), which improves survival (1).

In this sense, the primary initial objective of the surgery is early ligation of the renal artery and vein before any manipulation. This can avoid eventual tumour dissemination in addition to facilitating surgical removal in a bloodier surgical field (2).

In various series reported in the literature, the overall 5 yr-survival rates for stage I renal-cell carcinoma ranged between 65% an 93%, and for stage II renal-cell carcinoma (extension to perineal fat but within Gerota’s fascia) survival rates ranged between 44% and 68%. These survival decreased considerably when lymph-node metastases were present 0-20% (3).

The concept of early ligation of the renal pedicle to prevent dissemination from tumour manipulation (non-touch technique) has been widely accepted in surgical oncology for the past 30 years. Despite the reasoning behind this idea, once a tumour has reached sufficient size to be recognised clinically, there is a constant escape of tumour cells into the circulation and it is for this reason that the use of the lumbar approaches never disappeared and continue to be used, especially in the case of partial nephrectomy and small renal tumours (4). Currently, the initial approach to the renal pedicle is the first step required in laparoscopic nephrectomies, which is why the classic oncological imperative is combined to the technique.

The fundamental moment in a radical nephrectomy for carcinoma is handling of the renal pedicle. This facilitates the rest of the surgery by avoiding the difficulties inherent in an operation at this level in a surgical field that is much bloodier and has a reduced tumour size (5). With the pedicular problem resolved, the rest of the operation is normally routine.

The approach to the left renal pedicle requires as wide a field as possible. This facilitates vascular control and, especially, primary ligation of the renal artery, though it is behind the thick left renal vein located on top of the anterior surface of the aorta that it crosses.

The initial approach to the renal pedicle can only be performed via the transperitoneal approaches, not via lumbar or thoracoabdominal access routes. In the case of the left renal pedicle, we can access it via several transperitoneal routes:

- Inframesocolic route through the duodenojejunal angle with mobilization of the fixed loop, sectioning of the Treitz ligament and mobilisation of the 4th portion of the duodenum (left Kocher manœuvre), displacing it towards the midline together with the descent of the left angle of the colon which, in obese patients, may involve difficult access to the phrenicocolic ligament, thereby requiring traction of the ligament and possible injury to the spleen.

- In the presence of large renal tumours or in obese patients, the left renal pedicle can be accessed from the right side by performing a Kocher manœuvre, displacing the duodenopancreatic block to the left. The “right-sided approach” for left radical nephrectomy can be a good solution for difficult and complicated cases.

Figure 3. Direct access to the left renal vein and the anterior and lateral aspects of the aorta cranially to move complex and caudal pancreas-stomach and transverse colon, mesocolon left renal pedicle.
• Supramesocolic approach. The left renal pedicle is anatomically located completely within the supramesocolic region and is hidden below the transverse mesocolon below and the pancreas and posterior mesogastrium above. Opening of the subperitoneal tissue below the inferior border of the pancreas allows for quick access to the left renal vein crossing the anterior surface of the aorta. In order to achieve this last step, it is necessary to cross the omental transcavity (6).

This last approach allows for more direct and wider access to the left renal pedicle. The only limit above is the pancreas and the posterior mesogastrium which can be easily freed up to the diaphragmatic zone. The limit below is made up of the transverse mesocolon, which can easily be displaced downward. The limit on the right consists of the superior mesenteric artery, which reaches the pancreatic isthmus to the left, the inferior mesenteric vein, which can be ligated without incident, and the renal tumour itself (7).

The field is wide, which allows for contact with the anterior surface of the aorta and the thick left renal vein, which can be freed from its collaterals, thereby allowing the left border of the aorta to be reached and the left renal artery to be located in order to proceed with its ligation. Dissection allows the left pole and diaphragmatic dome to be easily reached together with the psoas, thereby facilitating suprapedicular lymphadenectomy (8). However despite the combined nephrectomy with lymphadenectomy does not increase morbidity or mortality, effectiveness in terms of increasing overall supervervivencia or progression-free survival has not been demonstrated, but if you allow adequate pathological staging (4). In patients with palpable lymph nodes or detectable by CT scan, lymphadenectomy should be performed which will produce adequate staging.

Another advantage of this approach is its performance, especially in the midline, left-sided dissection being more limited, leaving the spleen less exposed to injury and avoiding unnecessary splenectomies.

From the pedicular step, one can go on to free the renal capsule directly and often without the need to sag the left angle of the colon and free the descending colon (9).

For surgery of the left suprarenal gland, we note that it is anatomically associated with the left lobe of the liver, the greater curvature of the stomach and sometimes with the tail of the pancreas (10).

Using the supramesocolic approach, the transperitoneal approach to this structure can be carried out with greater ease by entering the omental transcavity through the opening in the greater omentum or the gastrocolic omentum between it and the transverse mesocolon that forms the floor of the cavity. It is advantageous to respect the gastro-omental arcade despite the fact that gastric vascularization is ensured by the pyloric vessels, the short vessels and the oesophageal branches of the left gastric artery (10).

Opening of the posterior peritoneum from the transcavity can be performed via the superior or inferior border of the pancreas. This allows for direct access to the superior renal pole, the suprarenal gland and the primary suprarenal vein that arises from the left renal vein (11, 12).

CONCLUSION

The removal of renal and adrenal masses are a challenge to the urologist, because sometimes the conventional surgical technique may not be useful in advance. The adapting vascular control and complete resection of the mass require adequate exposure.

Processes usually kidney tumor of the adrenal glands, which by virtue of their size and organ involvement and neighboring structures still require previous hits visceral mobilization transperitoneal demand to generate a sufficient field abdominal areas of difficult access.

Knowledge of surgical techniques such as access supramesocolic the left renal pedicle is useful and should be remembered, as it can facilitate the course of retroperitoneal surgery avoiding complications and providing comfort to frequently committed performances. The supramesocolic approach to the left renal pedicle continues to be useful and should be remembered, as it can facilitate the course of retroperitoneal surgeries by avoiding complications and providing comfort for procedures that are often compromised.
REFERENCES AND RECOMMENDED READINGS
(*of special interest, **of outstanding interest)


