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Simultaneous bilateral thoracic sympathectomy by electrocoagulation

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Introduction

The use of videothoracoscopy in the treatment of patients suffering from hyperhidrosis of palm and armpit has made it easier to carry out this procedure, which is considered of low morbidity and of short average stay.

Aim

To assess the efficacy of bilateral electrocoagulation of the thoracic sympathic nerve (T2-T4) by video-thoracoscopy through an incision in each hemithorax.

Method and material

A prospective protocol was elaborated and applied to 10 patients who were operated with this surgical technique from July 1999 up to November 1999. Different parameters were examined.

Results

Ten patients were operated on, 6 women and 4 men, with an average of 23.4 years old. It took 28.6 minutes between anaesthesia and placing the patient in the right position. Twenty-five minutes were needed to carry out the procedure in each hemithorax, taking 97.5 minutes until patient extubation.

Only one incision was made in the 4th or 5th intercostals space with the anterior armpit line. An increase in the temperature of the hands of 2.4 and 3.0ºC was observed.

Three hours after surgery, the drains were removed in 8 patients after clinical and radiological examination. In the other 2 cases, the drains were removed after 24 hours because of a residual pneumothorax. The average hospital stay was 2-3 days with 100% effectiveness in the palm. Most of the patients presented compensatory anterior or posterior thoracic sweating, with no pain after 15 days.

All the patients expressed their satisfaction with the surgical procedure.

Conclusions

Dorsal sympathectomy by videothoracoscopy is an effective and low morbidity procedure. Simple electrocoagulation with only one incision in each side is as effective as the ganglionar resection (T2-T4). Moreover, it can shorten the surgical time, and improve the aesthetic quality and patient comfort.

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Laparoscopic aortoiliac surgery for occlusive and aneurysmal diseases

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Summary

Purpose: To analyze the results of 6 years of experimental surgery and 4 years of clinical experience in laparoscopic aortoiliac surgery.
Methods: After approval of the Ethics Committee of our Faculty, a laparoscopic abdominal aortoiliac restoration was performed in 60 patients (51 men; mean age: 61 years, range: 42 to 79 years), for aortoiliac occlusive disease (AIOD, n= 37) and for infrarenal abdominal aortic aneurysm (AAA, n = 23).
Results: Three intraoperative conversions (5%) were performed. Three patients died (5%) and 12 early

reinterventions (20%) were necessary. Analysis of our results shows that operating and clamping durations and the length of hospitalization decreased significantly with the appearance of a learning curve in patients operated for AIOD ($p < 0.001$) and for AAA ($p < 0.006$).
Conclusion: These preliminary results show the feasibility of laparoscopic aortic restorations. This series reveals improved post-operative comfort, reduction in hospital length of stay and stable mid-term results.

Although laparoscopic aortic surgery was, until a few years ago, the work of only a few pioneers[1-3], more and more surgical teams are taking an active interest in this field, as can be seen in the increasing number of articles and courses devoted to this subject[1-5]. In addition to conventional and endovascular surgery, vascular laparoscopic surgery seems to have become a 3rd technique, which may offer the patency rates of conventional surgery at the cost of aggressiveness close to that of endovascular surgery[1-5]. Different techniques have nevertheless been proposed, from the minimally invasive non video-assisted surgical procedure to the totally laparoscopic reconstructions with their respective advantages and disadvantages[2-5]. Developments in surgical experience and appearance of new, specific instrumentation will help to define the real benefit of laparoscopic aortic restorations.

We began our experimental studies in 1996 on living animals and on human cadavers, in order to learn the surgical laparoscopic technique and also to try to understand the main difficulties associated with the different abdominal and thoracic aortic approaches. These studies also allowed us also to develop laparoscopic instruments which were designed to solve the specific situations encountered during these new procedures[2,5]. In January 1998, the Ethics Committee of our University gave us the authorization to start a clinical study on patients presenting with severe aortoiliac occlusive disease (AIOD) and secondarily with an abdominal aortic aneurysm (AAA). This complementary experimental and clinical experience allowed us to deduce both the advantages and disadvantages of these new techniques. The aim of this article is to expose the main results and then the lessons learnt from this 6-year activity.

Experimental studies

In 1996, the wide experience gained by gastro-enterologic surgeons in laparoscopic surgery in the preceding 10 years convinced us to explore the possibility of laparoscopic aortic restorations. Our first step was to perform experimental studies in order to try to find answers to the multiple questions linked to these new techniques.

The different laparoscopic aortic approaches

During experimental studies, we compared the laparoscopic *retroperitoneal versus transperitoneal approach* and abdominal aortic replacement in pigs. Although both techniques were feasible, the transperitoneal approach appeared simpler, and offered better exposure of the right lumbar and renal arteries, and the right iliac axis[2]. In order to retract the 20 to 24-meter-long bowel of the pig into the upper part of the abdomen, the operating table had to be tilted to a 30º Trendelenburg position.

Further use of transperitoneal approach in patients showed that remaining in a 30° Trendelenburg position was not always well-tolerated by our arteriosclerotic patients and, in Barbera's series[3], one patient had ventilatory support until postoperative day 4 due to apical lung atelectasis. This lead us to develop a laparoscopic intestinal retractor.

In order to confirm the accuracy of these techniques, a laparoscopic abdominal aortic replacement was performed in six pigs associated with a *laparoscopic renal artery reimplantation*[2]. Proximal and distal aorto-prosthetic anastomosis, using a six-millimeter-Dacron®-graft, was performed in a mean time of respectively 59 (40-75) min and 64 (50-80) min. Mean duration of the 2 to 3-mm-left-renal artery direct reimplantation was 72 (40-140) min. A progressive decrease in the duration of the laparoscopic dissection and anastomotes in the six pigs (Figure 1) illustrated our learning curve.

The feasability of the *thoracoscopic approach to the descending thoracic aorta* was also demonstrated experimentally. Despite the residual risk of paraplegia associated with aortic clamping, this approach appeared to be an option in patients with a hostile abdomen or highly calcified aorta.

Development of a new instrumentation

Laparoscopic aortic clamps were the first instruments that needed to be develop for performing these new procedures. A first generation of clamps with a round 12 mm body, and a distal articulation were built making it possible to introduce the instrument directly through the abdominal wall with no use of a trocar[2].

Different types and sizes of clamp were constructed to be used either on the abdominal or thoracic aorta, and to perform an end-to-end or an end-to-side aorto-prosthetic anastomosis. In parallel, a whole series of releasable clamps were developped in order to be placed temporarily on the main aortic collaterals (iliac, renal and mesenteric arteries) during the procedure. These releasable clamps are placed and removed by a laparoscopic forceps introduced through a trocar which can also be used for other instruments. At present, new laparoscopic aortic clamps with an improved design and a 10 mm body diameter are beeing developed.

As mentioned above, the main difficulty for performing a transperitoneal aortic dissection was bowel retraction. A study on cadavers[13] allowed us to develop a *laparoscopic intestinal retractor* (Figure 1) (Karl Storz GmbH & Co, Tuttlingen, Germany) composed of:

- a 28 x 12 cm net, with a 2-cm revers sewn along its long edge,
- a 3 mm diameter and 50 cm long malleable metallic rod, the distal part of which was designed to follow the mesenteric root,
- 3 to 5 separate 12 cm long threads with a straight needle on an extremity and a pea on the opposite extremity.

The distal part of the rod was designed to fit on to the left edge of the 4th duodenum, the promontory and the lateral edge of the right iliac axis. The net is then introduced into the abdomen through a trocar and the revers is slipped laparoscopically around the rod before fixing the proximal and external part of the rod to the operating table. The other long edge of the net is then fixed by means of 3 to 4 threads to the abdominal wall, maintaining the small intestine in the right part of the abdomen. Further clinical experience in more than 45 patients showed that this instrument was as useful during the laparoscopic dissection as when performing a minilaparotomy[5].

Teaching laparoscopic aortic surgery

The growing interest of vascular surgeons in laparoscopic aortic surgery has led to the organization of different workshops devoted to this subject. In the last 3 years, our team was responsible for 5 French-speaking and English-speaking courses in the European Institute of TeleSurgery (Strasbourg, France). During each 3-days seminar, a theoretical and practical training on live pigs was offered to 34 vascular surgeons who performed laparoscopic retroperitoneal, transperitoneal and thoracic approaches on 17 fully-equipped operating tables. The best European experts were present to communicate their experience and to supervise the participants during the procedures. Three other seminars are scheduled in 2002.

In addition, on January 17, 2002, we are organizing, the 2nd workshop on cadavers for surgeons interested in practicing on diseased aorta.

From these courses, we have been able to assess that most vascular surgeons can learn laparoscopic techniques, and perform a laparoscopic dissection of the abdominal and thoracic aorta in pigs and/or cadavers with a short learning curve.

Clinical studies

When we began our clinical activity in 1998, several important questions remained unanswered: -what are the appropriate indications?- which surgical approach should be used? -when should a totally laparoscopic technique be performed rather than a minilaparotomy?- how long is the learning curve?

Four years later, 60 patients underwent a laparoscopic aortic reconstruction in our department, and we are able to give partial answers to these questions.

Totally laparoscopic surgery or videoassisted surgery?

The question of whether or not a minilaparotomy is useful during laparoscopic procedures has already been raised in other abdominal operations, but is of special interest in aortic surgery because of the length of the whole procedure and especially of clamping time. In the literature, several authors have reported that the mean duration of totally laparoscopic aortobifemoral by-pass varies from 279 to 420 min[3,5], with a mean clamping time of 59 to 120 min. These mean values were respectively of 160 to 360 min and of 73 to 146 min for authors using a minilaparotomy[4,5], with a low decrease along the learning curve.

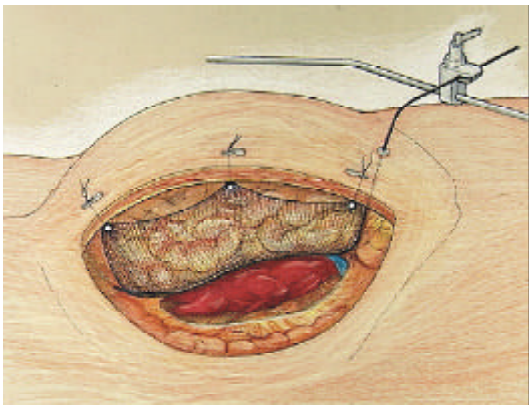

Figure 1.
Drawing showing the region of the aorto-iliac dissection after implantation of our laparoscopic intestinal retractor

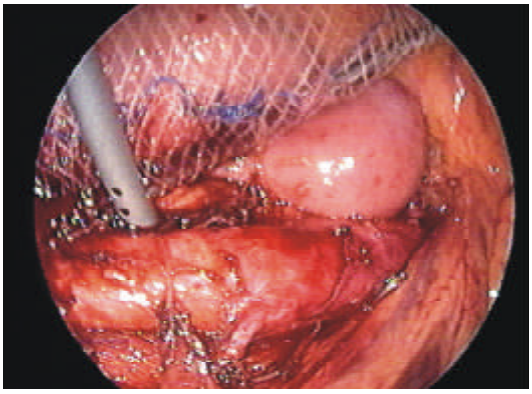

Figure 2.
Intraoperative view: laparoscopic transperitoneal dissection of the infrarenal aorta after placement of our laparoscopic intestinal retractor

In our trials, we initially tried to perform a totally laparoscopic reconstruction in 15 patients presenting with severe AIOD. An important point is that unlike most surgical teams who have published in this field and who are both vascular and gastroenterologic surgeons, and thus have a wide experience of laparoscopic surgery, our activity is exclusively vascular; all our laparoscopic experience has thus been obtained from our experimental studies. A totally laparoscopic procedure was fully completed in 7 patients (Figure 2), one patient was converted to open repair and a 5-9-cm minilaparotomy was necessary to solve a technical sewing difficulty in the other 7 cases. In this first group of 15 patients, the mean operative and clamping times were respectively of 375 (240-420) min and of 115 (40-170) min. Secondly, the decision was made to systematically perform a minilaparotomy after complete laparoscopic dissection of the infra-renal aorta, introduction and placement of the graft prosthesis and laparoscopic clamps, and before completion of conventional aorto-prosthetic anastomosis. In a second group of 20 patients, this technique allowed us to significantly decrease the mean operative and clamping times which were respectively 214 min (155-245) *($p<0.001$)* and 30 min

(18-50) *(p<0,001)*, with no intraoperative conversion. No patient required a blood transfusion in this last group (versus 5 patients in the first group, *p< 0,01).* In addition, postoperative hospital length of stay was significantly decreased from 9.2 (5-30) days in the first group to 3.6 (3-12) in the second group *(p< 0,001).*

In terms of the instrumentation available at present, this study shows the benefit of a 5-9 cm minilaparotomy when performing a laparoscopic aortic reconstruction for the treatment of AIOD.

Our learning curve

Lengthy procedures and a steep learning curve are generally put forward against laparoscopic aortoiliac reconstructions, especially by vascular surgeons who have little knowledge in these new techniques. As modification to the technique, including performing a minilaparotomy can mostly explain the decrease in the duration of the operative and clamping time in the last patients treated for AIOD, the benefit of the learning curve can be better demonstrated in the patients treated for AAA, who all underwent the same operation. In this group of 20 patients, a laparoscopic aortoiliac dissection was systematically performed, with control of the proximal aortic neck and of both common iliac arteries. Secondly, a 6-9 cm minilaparotomy midline incision was made at the level of the umbilicus. An endoaneurysmorraphy was then performed by opening the aneurysm, occluding the lumbar arteries and performing an end-to-end aorto-prosthetic anastomosis with direct vision by using a Unigraft® vascular graft (B/Braun, Melsungen, Germany). Depending on the operation scheduled, the distal anastomosis/es is/are conventionally carried out on the distal aorta, on common iliac arteries, or on femoral arteries.

To demonstrate the effect of our learning curve, different parameters have been compared between the 10 first patients and the 10 last patients of this group of 20 patients who underwent laparoscopic AAA repair. Operative and clamping time decreased significantly from respectively 275 (185-360) to 211 (155-230) min *(p<0,006)* and from 101 (52-160) to 67 (42-62) min (*p<0,006*). Although the number of patients who received blood transfusion was similar (4 versus 3), postoperative hospital length of stay was significantly different: 6.8 (4-12) *versus* 4.4 (3-12) days *(p<0,003).*

It is important to mention that more than 10 patients with AIOD were first treated before starting the treatment of patients with AAA. From this study, we can mention that the difference in operative time between laparoscopic and conventional AAA repair is closing.

What are the benefits of laparoscopic aortoiliac surgery for the patient?

From our study of 60 patients (56 males, mean age: 61 years; ranging from 42 to 79) who underwent laparoscopic aortoiliac reconstruction for AIOD (n=37), or for AAA (n=23), we can indicate the following advantages and diadvantages of this technique, compared with conventional and endovascular repair.

In this preliminary series, 45 patients (75%) underwent a safe procedure and an uneventful postoperative hospital stay. During the operative period, absence of evisceration reduced liquid shifts and maintained body temperature at over 36°3 C at the end of surgery. The patients thus regained consciousness relatively quickly after surgery. During the postoperative period, these patients complained of less pains, and developed less infections. In this group, the patients where usually fed on postoperative day 1 or 2, and were discharged from hospital after a mean postoperative stay of 4.3 days (3 to 6 days). Obese patients, patients with short proximal AAA neck or patients with calcified aorta were gradually included in this study and are no longer considered as having contraindications.

For the remaining 15 patients (25%), 3 patients died (5%) from multi-organ failure (n= 2) and from a myocardial infarction (n= 1). The other 12 patients (20%) underwent early reintervention, which was abdominal, via the minilaparotomy in 5 patients and via the groin in 6 patients; all these patients had an uneventful recovery.

During a mean follow-up of 21.7 months (ranging from 1 to 45 months), 3 (5%) late reinterventions were necessary for occlusion of an aorto-bifemoral by-pass at three months in one patient and for occlusion of one limb due to intimal hyperplasia at 13 and 15 months in two other patients.

From our preliminary results, we can say that early postoperative mortality and morbidity after laparoscopic aortic restorations did not decrease, when compared with endovascular or conventional surgery. However, this technique improved comfort for a majority of our first patients with a quicker return to regular diet, less pain and infection, and decreased length of hospital stay. In addition, good mid-term results led us to follow our patients with minimal clinical examinations and investigations. This is comparable with the follow-up of patients after conventional surgery.

Conclusion

From our experimental and clinical studies, we have assessed the feasibility of laparoscopic aortic reconstructions for occlusive and aneurysmal diseases. Most technical difficulties linked to laparoscopic aortic dissection are gradually being solved by the development of specific instrumentation, such as laparoscopic aortic clamps and an intestinal retractor. This has been demonstrated by the ability of most vascular surgeons to learn this technique, as observed during the training courses we aorganise at the EITS (Strasbourg) and in the University of Marseille. Adjustment of new devices, such as staplers, to perform video-assisted aorto-prosthetic anastomosis are the next step for these techniques.

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Tratamiento de los aneurismas de aorta por videolaparoscopia

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Resumen

Introducción: la mortalidad quirúrgica de los Aneurismas de aorta abdominal (AAA) actualamente es inferior al 3% pero la morbilidad quirúrgica sigue siendo aún significativa y habitualmente secundaria a los problemas derivados de las grandes incisiones que se realizan.El postoperatorio es raramente inferior a la semana y cierto grado de morbilidad (hipotermia, dolor,atelectasias, ileo prolongado, seromas de pared, etc.) está presente en más de la mitad de los operados. La alternativa endovascular está lejos de ser la definitiva hasta la aparición de la endoprótesis perfecta, pero la aparición de la "cirugía videoasistida mínimamente invasiva" que conjuga la laparoscopia y la cirugía convencional (minilaparotomía) parece reducir significativamente dicha morbilidad.

Objetivo: mostrar que la cirugía laparoscópica de aorta abdominal es una alternativa factible y segura y que minimiza la morbilidad quirúrgica acortando la estancia hospitalaria.

Paciente y Métodos: se indicó cirugía a un paciente de 73 años por crecimiento de su aneurisma de aorta. Se procedió a utilizar la técnica videoasistida (laparoscópica), con creación de neumoperitoneo e introducción de trocares y a continuación se realizó la disección del aneurisma con el abdomen cerrado. Al finalizar se procedió a practicar una minilaparotomia para interponer la prótesis.

Resultado: el paciente requirió una analgesia mínima, inició la dieta a las 24h, la deambulación a las 48h y al 4º dia fue dado de alta totalmente asintomático.

Conclusiones: La cirugía mínimamente invasiva videoasistida de aorta apunta hacia una alternativa válida en el tratamiento electivo de los AAA.

Palabras clave: Aneurisma. Aorta. Cirugía. Laparoscopia. Minilaparotomía. Videoasistida.

Introducción

La cirugía aórtica abdominal, ha avanzado de una forma espectacular en los últimos 50 años sobre todo gracias a los avances en la anestesia y la técnica operatoria. La morbi-mortalidad en la cirugía electiva es actualmente baja y oscila entre el 2% y el 5%[1].

Es una cirugía en la que el abordaje abierto de la aorta requiere en la gran mayoría de casos una laparotomía medio xifo-pubiana en la versión de abordaje transperitoneal o bien una gran incisión en el flanco izquierdo si ésta es retroperitoneal; en ambas situaciones, la pérdida de líquidos, ileo prolongado y la utilización de analgésicos mayores suele ser la tónica general en el postoperatorio, y contribuye a alargar la estancia hospitalaria.

Dado que el abordaje laparoscópico en cirugía general y digestiva se ha demostrado factible y con una muy significativa disminución de la morbilidad quirúrgica, empezó a despertar el interés de esta técnica en la cirugía vascular. Dion *et al.*[2] fueron los primeros en describir un by-pass aortofemoral mediante técnica videoasistida y a partir de entonces han ido apareciendo diversos estudios en animales así como series cortas en enfermedad oclusiva y aneurismática[3-5] si bien la cirugía totalmente laparoscópica en enfermedad aneurismática ha ido quedando sustituida por lo que se vendría a llamada "Cirugía minimamente invasiva videoasistida", lo que implica realizar una minilaparotomia al final para emplazar la prótesis, con el fin de evitar largos tiempos de clampaje aórtico[6].

Objetivo

El objetivo de este trabajo es mostrar que es una técnica factible, fiable y segura y que una vez realizada la curva de aprendizaje es una cirugía que puede llegar a disminuir significativamente la morbilidad postoperatoria (íleo, dolor, estancia hospitalaria, etc.) en la cirugía del aneurisma de aorta.

Paciente y Métodos

Se indicó cirugía aórtica a un paciente de 73 años de edad con antecedentes de tabaquismo, linfoma amigdalar tratado con quimioterapia y radioterapia hace 10 años, diverticulosis colónica, apendicectomía, y colecistectomía por laparoscopia hacía 8 meses, y que presentaba un aneurisma de aorta infrarrenal de 5 cms de diámetro que habia crecido 0,6 cms los últimos 6 meses. Había ausencia de parámetros que pudieran contraindicar la técnica laparoscópica (enfermedad pulmonar obstructiva crónica, obesidad severa, cirugia abdominal previa mediante incisión en vía media y ausencia de afectación de la aorta suprarrenal así como de los vasos iliacos) y tras obtener el consentimiento informado se procedió a realizar la intervención en la modalidad de "Técnica mínimamente invasiva videoasistida", lo que conllevó que fuera realizada de la siguiente manera:

La técnica anestésica difiere poco de la habitual (halógenos y balanceada), y es la estandarizada en la cirugía aórtica, con Presión arterial cruenta, (TA), Presión Venosa

Central (PVC), y un par de vías venosas, sondaje urinario y colocación de sonda nasogástrica. Asimismo se dispondrá de Tº esofágica o vesical (a través de la sonda urinaria), capnógrafo, y calentadores de fluidos.

Creación del neumoperitoneo y colocación de trocares o cánulas: el paciente se coloca en decúbito supino y tras asepsia y entallado standard del campo quirúrgico, mediante una miniincisión supraumbilical (<1cm) se introduce el trocar o cánula de Hasson en la cavidad abdominal mediante visión directa por el laparoscopio, y se establece un neumoperitoneo con CO_2 a 12-15mmHg de presión. Posteriormente ya sea por visualización directa por el laparoscopio (cámara) o bien por transiluminación (apagando las luces de quirófano) se colocan de forma segura (evitando vasos de la pared abdominal) los trocares[5] de 10mm tal como se datalla en la Figura 1.

Posición del paciente: una vez colocados los trocares, la correcta colocación del paciente es básica y es posicionado en Trendelenburg a 15-20º y en decúbito lateral derecho a unos 30º, lo que facilitará la separación de los intestinos.

La cirugía se inicia con una correcta retracción de los intestinos que por gravedad se acumulan en el ángulo hepático, y se empieza por la disección del cuello del aneurisma justo por debajo de la vena renal izquierda retrayendo el duodeno mediante disección roma y coagulación. A continuación se sigue la disección por las caras medial y lateral del cuello hasta llegar al cuerpo vertebral, posteriormente se aborda tan sólo por cara medial el resto del aneurisma hasta llegar a los ejes iliacos procediendo de forma similar al cuello aórtico. Al finalizar la disección laparoscópica se retiran los trocares y se realiza una minilaparotomia entre 7-9 cms (Figura 2) a nivel periumbilical evacuando el CO_2, heparinización sistémica y colocación del clamp aórtico que se introduce por el orificio 6 y los de las arterias iliacas por los orificios 3 y 4 (Figura 3). A continuación la sistemática es la apertura del saco aneurismático, transfixión de arterias lumbares e interposición de una prótesis recta de dacron de 18mm en este caso mediante sutura de polipropilene de 3/0. Posteriormente se procede al cierre previa reversión del la heparinización sistémica con sulfato de protamina.

Al finalizar la intervención quirúrgica según protocolo hospitalario es llevado a la Unidad de cuidados intensivos postoperatorios (UCIPO) durante 24h, que de no existir incidencias es llevado a continuación a planta.

Resultado

El paciente fue extubado a las 2h de finalizada la intervención y requirió analgésicos menores tan sólo las primeras 24h para control del dolor postoperatorio.

Figura 1. Inserción de los trocares: 1. Aspiración irrigación. 2. Cámara. 3. Tijeras-coagulación. 4. Pinzas. 5 y 6. Separadores. 7. Minilaparotomía (7-9 cm)

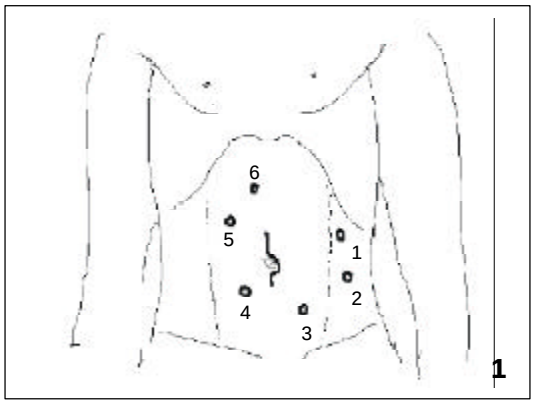

Figura 2. Minilap

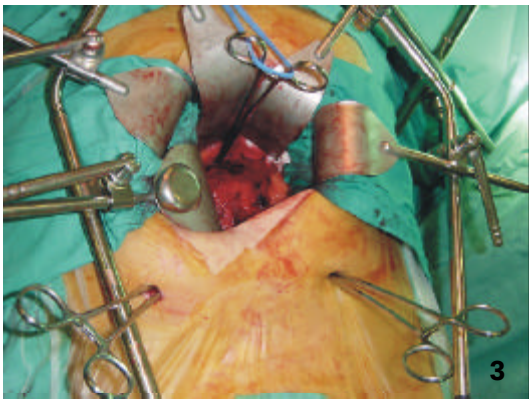

Figura 3. Abordaje

Figura 4. Resultado Final

El peristaltismo abdominal estuvo presente ya en el 1º día postoperatorio, iniciando la dieta vía oral. La sedestación y deambulación fue posible a las 48h y fue dado de alta al 4º día postoperatorio.

Acudió el dia 10º para retirada de los puntos (Figura 4), encontrándose asintomático en la actualidad.

Discusión

Hoy en día los procedimientos electivos sobre la aorta abdominal se realizan de una forma segura y con una mortalidad quirúrgica (30 días) inferior al 3% en los centros especializados[1]. Sin embargo la exposición de la aorta abdominal requiere de una gran incisión media abdominal (xifo-pubiana) o bien de una en el flanco que cruza muchos dermatomos y planos musculares y ambas se asocian a un importante dolor postoperatorio. También existe un empeoramiento de la función pulmonar considerable, pues estas incisiones llegan a suponer un deterioro de la capacidad vital respiratoria del 50%, y acarrea una mayor incidencia lógicamente de atelectasias y ocasionalmente de neumonía en el postoperatorio[7].

La manipulación, evisceración, tracción de mesos, exposición al aire y al calor (lámpara quirúrgica) de los intestinos contribuye a una gran pérdida de líquidos y temperatura, aumentado el tiempo de ileo postoperatorio y consecuentemente a una mayor estancia hospitalaria en definitiva[4-6].

Ultimamente con la aparición de la cirugía laparoscópica en cirugía digestiva, ha posibilitado intervenciones en pacientes con situaciones comprometidas desde el punto de vista de edad y de estatus cardíaco, y viendo que el tiempo de recuperación y dolor postoperatorio eran menores, se ha empezado a plantear la aplicación de esta técnica en cirugía vascular principalmente por las ventajas asociadas a un acto quirúrgico significativamente menos invasivo.

La cirugía abierta de los aneurismas de aorta se asocia casi siempre a una hipotermia postoperatoria significativa que puede conllevar no sólo problemas de coagulopatía en el postoperatorio sino problemas de índole cardíaco[8].La aplicación de la laparoscopia permite que al realizarse la disección con el abdomen cerrado la temperatura permanezca inalterada, y con una menor demanda de fluidos durante la cirugía. A ello también contribuye la menor manipulación de los intestinos. La resultante final es un menor tiempo de ileo postoperatorio (inicio de la dieta via oral más rápida), y el tercer espacio que se crea por la manipulación de asas intestinales, aporte de fluídos, etc., es prácticamente inexistente[5,6,8]. La realización de una minilaparotomía de 7 a 9 cms al finalizar, para interponer la prótesis, reduce mucho el dolor postoperatorio que habitualmente presentan los pacientes sometidos a las grandes incisiones[6].

La duración de la intervención viene dada por la destreza en la parte Laparoscópica y se le asigna habitualmente el 40%-60% del total del tiempo quirúrgico dependiendo en que parte de la curva de aprendizaje se encuentre el cirujano. La minilaparotomía requiere tan sólo de una buena disección laparoscópica previa, para poder proceder lo más rápido y seguro posible a la apertura del saco, control del posible sangrado retrógrado de las lumbares (es la única pérdida hemática que debería existir) e interposición de la prótesis[6].

Otra parte importante es interpretar correctamente los cambios hemodinámicos que se producen durante el neumoperitoneo, pues las medidas de control de TA, PVC, etc no son los deseadamente fiables; la creación de un neumoperitoneo comporta una elevación del diafragma creando una situación restrictiva desde el punto de vista de función respiratoria y también en la relación a la perfusión-ventilación; a nivel cardíaco, la insuflación de CO_2 en la cavidad abdominal disminuye el retorno venoso, aumenta la resistencia vascular periférica, limitando todo ello el gasto cardíaco pudiéndose llegar a crear problemas de arritmias, si bien todo ello se normaliza a los 30 min. en pacientes con función cardíaca normal[9]. Es por este motivo que el método de control óptimo es la utilización del Ecocardiógrafo transesofágico (TEE), al ser independiente de la presión intratorácica, permite una monitorización continua del ventriculo izquierdo, observando el llenado y vaciado así como las anormalidad de motilidad de su pared que hagan sospechar isquemias miocárdicas incipientes[8,9].

Otro efecto deletéreo del neumoperitoneo es la disminución de la diuresis que tiene un origen multifactorial como es la compresión del parénquima (reducción de la filtración glomerular) y cierto grado de vasoconstricción por el incremento en la PaCO2 y la hipersecreción de hormona antidiurética y de angiotensina II[10].

También el intestino delgado puede resultar afectado con una isquemia de mucosa y se correlaciona con el tiempo total de neumoperitoneo.

La Laparoscopia proporciona además una visualización correcta de toda la cavidad abdominal y permite una disección cuidadosa del aneurisma, situación que no se da si tan sólo realizáramos la intervención mediante la minilaparotomia con instrumental convencional como técnica de entrada.

La realización final de la minilaparotomia revierte además todos los efectos del neumoperitoneo, y minimiza el tiempo total de intervención cuando se compara con una técnica totalmente laparoscópica, que hasta el momento presente y hasta que no se mejoren las técnicas e instrumental de anastomosis vascular, la hacen totalmente desaconsejable por los larguísimos tiempos de clampaje que se requieren[6].

Conclusiones

Las pequeñas series publicadas hasta la actualidad también avalan que es una técnica factible, segura y que las potenciales ventajas traducidas en una disminución de tiempo de recuperación quirúrgica como resultado de una menor agresividad (no evisceración, mínima manipulación de los intestinos, mínimo tercer espacio, ileo, dolor postoperatorio, etc.), hacen pensar que pueda ser una alternativa válida en el tratamiento quirúrgico electi-

vo de los aneurismas de aorta abdominal infrarrenal, a la espera quizás de la endoprótesis definitiva.

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