

# Laparoscopic adrenalectomy: Transperitoneal lateral approach. Cases study



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## Laparoscopic adrenalectomy: Transperitoneal lateral approach. Cases study

**AIM OF THE STUDY:** *To compare the results of the laparoscopic adrenalectomy achieved with the traditional laparotomic one.*

**MATERIAL AND METHOD:** *In the period 1997-September 2004 we treated 17 patients with adrenal pathology: eight patients underwent to an open anterior transperitoneal adrenalectomy and nine patients underwent a laparoscopic adrenalectomy with lateral transperitoneal approach.*

**RESULTS:** *Among the immediate results a longer operative time was evident in the laparoscopic approach and a greater blood loss in the open approach; there were no conversions to a laparotomic procedure. In the postoperative period there were some bronchopneumonic infiltrates and some infections of the laparotomy in the open group; in the laparoscopic group there was a parietal haematomas that cleared up spontaneously, in correspondence of a trocar access.*

**DISCUSSION:** *Both procedures allow to achieve the complete resolution of the adrenal pathology if it is confined within the gland and no more than 8 cm. in size.*

*The morbidity in the miniminvasive approach is surely much lower than the open technique. The advantages of a laparoscopic approach can be found in a minor surgical stress. The evident datum that results from the literature analysis of the results of the the laparoscopic adrenalectomies, is the very rapid resumption of the normal activities in the postoperative course.*

**CONCLUSIONS:** *The laparoscopic adrenalectomy with lateral transperitoneal approach is a safe and efficacious procedure. Therefore, the AA can believe that the laparoscopic approach is at present the gold standard in the treatment of all benign adrenal pathologies with a no more than 8 cm. size.*

**KEY WORDS:** Adrenalectomy, Laparoscopy, Transperitoneal lateral approach.

## Introduction

The laparoscopic adrenalectomy is the most used surgical procedure for the treatment of the adrenal tumours. Both the retroperitoneal and the transperitoneal approaches can be utilized within this procedure. At present there is an interest in using the laparoscopic approach even for large tumours and for neoplasia with suspicion of malignancy.

With this study we intend to compare the results of the laparoscopic adrenalectomy achieved in an Operative Unit of General Surgery with the traditional laparotomic one.

## Material and Method

In the period 1997 - September 2004, we treated 18 patients with adrenal pathology, 10 females, 8 males, with a mean age of 52 years, in the Division of University General Surgery of the Medical School of Foggia University. In the period 1997 - 2001, nine patients underwent an open traditional adrenalectomy, with an anterior transperitoneal approach: 6 left adrenalectomies and 3 right adrenalectomies. One patient was excluded from this study because he was carrier of a great right adrenal mass (22 cm in size) that was a malignant neoplasia of the adrenal cortex who underwent an open adrenalectomy. In the period 2001 - September 2004 a laparoscopic adrenalectomy with lateral transperitoneal approach was executed in nine patients: 7 left and 2 right adrenalectomies.

Among the 17 patients affected by a benign adrenal patho-

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logy, that were object of this study, the anatomical-clinical scenario included 9 pheochromocytomas, in which there were 4 patients carriers of MEN-2A, 3 Conn's adenomas and 5 incidentalomas (adrenal cortex adenoma).

The size of the tumours, in the laparoscopic group, was in mean 3.5 cm, with a range between 0.8 and 8 cm. In the open group, the size of the tumours was in mean 4.2 cm with a range between 1.3 and 9.5 cm.

There was also an important datum: in all patients the CT-scan showed neoplasia well encapsulated and confined in the adrenal gland.

We chose the lateral transperitoneal laparoscopic approach in all cases.

We used some technical details in a very careful way: the precocious binding of the adrenal vein, the positioning of a tubular drainage at the end of the operation, the greatest care in preserving the anatomical integrity of the adrenal gland. In our experience the use of such particular instruments for the dissection and the hemostasis did not have a manifest role. The careful dissection and the use of a normal electric scalpel provided with satisfactory results.

We established a comparison between a first group of patients that underwent a traditional anterior transperitoneal laparotomic adrenalectomy and a second group of patients that underwent a lateral transperitoneal laparoscopic approach.

The comparison was based on intraoperative technical aspects and the evolution of the postoperative course.

## Results

Among the immediate results a longer operative time was evident in the laparoscopic approach, and it was not followed by clinical sequelae. On the contrary, there was a greater blood loss in the open approach, even if it was contained within a modest amount and it did not lead to hemodynamic changes or to the need of blood transfusions.

There were no conversions to a laparotomic procedure in our experience. In the postoperative period there were some bronchopneumonic infiltrates and some infections of the laparotomy in the open group; on the contrary in the laparoscopic group there was a parietal haematoma that cleared up spontaneously, in correspondence of a trocar access (Tab. I).

In short and after all that, the immediate results of the laparoscopic adrenalectomy, related with the traditional laparotomic approach, showed consolidated and unquestionable advantages, as it results from the literature<sup>1-4</sup>: minor use of analgesics, precocious mobilization, very fast canalization and resumption of alimentation, short hospital stay (in our series, 4 days vs. 9 days in mean), better aesthetic result.

The distant results were not taken into account because they did not fall within the aims of this study.

TABLE I – Immediate results (17 patients with adrenal pathology).

	Open adrenalectomy	Laparoscopic adrenalectomy
Operative time (in mean)	140 minutes	180 minutes
Conversion	–	No
Blood loss (in mean)	190 ml	105 ml
Bronchopneumonic infiltration	2	–
Wound infection (laparotomy)	1	–
Abdominal hematoma at a port-site	–	1

## Discussion

The first consideration that derives from the comparison between the laparoscopic adrenalectomy and the open one is that both procedures allow to achieve the complete resolution of the adrenal pathology. The data reported in literature<sup>1,5-8</sup> confirm this consideration.

The morbidity and the operative mortality in the minimally-invasive approach are surely much lower than the open technique, because of the anatomical position of the adrenal gland that imposes a wide access and an extensive dissection in the laparotomic operation.

Therefore, the advantages of a laparoscopic approach can be found in the elimination of great laparotomies, minor dissection with subsequent minor possibility of lesion of adjacent organs or structures, smaller blood loss, in short a minor surgical stress.

The absence of a great laparotomy surely implies a minor number of postoperative cardiologic and pulmonary postoperative complications, and a minor risk of infection<sup>9-11</sup>.

The evident datum that results from the literature analysis of the results of the laparoscopic adrenalectomies, is the very rapid resumption of the normal activities in the postoperative course.

The patient can be dismissed in very few days; besides, there are the important functional and aesthetic results of the integrity of the abdominal wall.

Yet, all these positive considerations for the laparoscopic approach, that are unanimously accepted and no more discussed, are related to benign adrenal pathologies and to a specimen of moderate dimensions (no more than 6-8 cm).

At present the discussion is based on other arguments. First of all, the different types of adrenal neoplastic pathology must be evaluated. In fact, the therapeutic choices, the technical difficulties and the different morbidity, in the laparoscopic approach, are conditioned by

the different neoplastic pathologies: for example, a partial laparoscopic adrenalectomy was proposed for the treatment of the Conn's adenoma<sup>12</sup>.

Moreover, the laparoscopic adrenalectomy for pheochromocytoma implies greater technical difficulties and shows higher morbidity<sup>13,14</sup>.

The treatment of the pheochromocytoma requires an adequate pre- and intra-operative therapeutic management based on the reestablishment of the blood volume and on the use of the calcium antagonists<sup>15,16</sup>.

From a technical point of view, it is opportune to reduce the manipulation of the mass during the intervention, and, in this way, laparoscopy is a favourable approach.

In fact, in the past, the sudden introduction in circulation of catecholamine owing to the excessive surgical manipulation, was left because of the blood pressure alterations not so easy to manage.

In order to program the laparoscopic approach in a correct way, an accurate anatomical-clinical definition of the pheochromocytoma is necessary. In the preoperative phase, it must be established if it is sporadic or connected with complicated syndromes such as the MEN-2, von Recklinghausen disease, von Hippel-Lindau disease, and if it is monolateral or bilateral, as it happens in many MEN-2A cases.

A further element of discussion is represented by the tumour size in the laparoscopic approach.

The laparoscopic adrenalectomy is, at present, considered the gold standard in the treatment of the tumours of size between 7 and 8 cm. The surgical indications, at first limited, increased later, as it happened in others fields of the laparoscopic and miniminvasive approaches, because it was proved the feasibility of the procedure.

In this way, the size limit of adrenal neoplasia were increased little by little but considering that the lesion had not to invade the adrenal capsule in the CT-scan study.

In fact, it must be considered that the risk of malignant neoplasia is very high for greater size lesions<sup>1,7,17-21</sup>.

The debate about the possibility of treating also the malignant adrenal neoplasia by laparoscopy, is still open.

In fact, the few data in literature are controversial as they do not offer a well defined orientation: some Authors are against<sup>22</sup>, and other ones think that the procedure applies also to malignant neoplasia<sup>17,23</sup>. In short, we can consider the laparoscopic approach valid and effective in cases with a preoperative diagnosis of well defined local invasiveness. Instead, the laparoscopic approach becomes much more difficult and unsafe in cases without preoperative diagnosis, but with an intraoperative diagnosis: in these cases the risk of local metastases is very high.

## Conclusions

The laparoscopic adrenalectomy with lateral transperitoneal approach proves itself to be a safe and efficacious

procedure. In particular, as to the operative phase, in comparison with the traditional laparotomic adrenalectomy, it is clearly favourable because of the minor possibility and frequency of intraoperative incidents and because of the minor blood loss: both of them are connected with the absence of the laparotomy and with the minor exposition and surgical dissection. Besides, the postoperative course is surely more comfortable and rapid on the whole, and it is followed by a precocious dismissal.

Therefore, we can believe that the laparoscopic approach is at present the gold standard in the treatment of all benign adrenal pathologies with a no more than 8 cm size.

There is no standard and unanimous orientation about the treatment of tumours greater than 8 cm, and, above all, about the treatment of malignant lesions.

Both the above mentioned situations require a further increment of experience.

## Riassunto

**OBIETTIVO:** La surrenectomia laparoscopica è il gold-standard per il trattamento di molte patologie del surrene. Lo scopo di questo studio è stato di confrontare le surrenectomie open con quelle laparoscopiche eseguite nel nostro Dipartimento Chirurgico.

**MATERIALE E METODO:** Dal 1997 al settembre 2004 sono stati studiati retrospettivamente 17 pazienti con patologie surrenaliche, 9 femmine e 8 maschi, con un'età media di 52 anni. Sono stati eseguiti 8 interventi transperitoneali laterali open o 9 laparoscopici.

Le patologie surrenaliche rappresentate sono state le seguenti: 9 feocromocitomi (4 MEN-2A), 3 adenomi di Conn e 5 incidentalomi. La dimensione media dei tumori è stata di 3,5 cm. (range 0,8-8 cm.) nel gruppo laparoscopico, contro i 4,2 cm. in media con un range tra 1,3 e 9,5 cm. nel gruppo open; l'esame TAC ha dimostrato tumori ben incapsulati confinati alla ghiandola surrenalica. Il tempo operatorio medio è stato più lungo nel gruppo delle surrenectomie laparoscopiche (180 min) rispetto al gruppo open (140 min); in contrasto, la perdita ematica media è stata minore nel gruppo laparoscopico (105 ml) rispetto all'intervento tradizionale (190 ml). La morbilità postoperatoria in laparoscopia è stata rappresentata da un piccolo ematoma addominale all'accesso di un trocar.

**DISCUSSIONE:** Nelle surrenectomie open la morbilità è stata rappresentata da 2 infiltrati broncopneumonici ed un'infezione della ferita laparotomica. L'accesso laparoscopico è stato più vantaggioso a causa di un minore uso di analgesici, una più rapida mobilizzazione e canalizzazione del paziente, una più rapida ripresa dell'alimentazione, una più breve degenza postoperatoria ed un migliore risultato estetico.

**CONCLUSIONI:** La surrenectomia laparoscopica transperi-

toneale laterale si è confermata essere un approccio sicuro ed efficace. In conclusione, l'approccio laparoscopico è di sicuro la procedura di scelta per il trattamento delle patologie surrenaliche benigne di dimensioni non superiori agli 8 cm.

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