Actas Urológicas Españolas. 2011;**35(2)**:119–122

Actas Urológicas Españolas

www.elsevier.es/actasuro

CASUISTRY

Partial laparoscopic adrenalectomy in primary hyperaldosteronism

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Received November 12, 2010; accepted November 23, 2010

KEYWORDS
Hyperaldosteronism;
Conn's Syndrome;
Laparoscopy;
Partial Adrenalectomy

Abstract

Introduction: Primary hyperaldosteronism is one of the few potentially curable causes of secondary arterial hypertension. One of the most important variants is the adenoma of the adrenal cortex that produces aldosterona (Conn's Syndrome). The treatment of choice in this subgroup of patients was the removal of the lesion. A first series of aldosteronoma-carrying patients subjected to partial laparoscopic adrenalectomy is presented.

Materials and method: We examined the case selection and methods applied to hypertensive patients subjected to partial laparoscopic adrenalectomy between November 2001 and March 2004 due to primary hyperaldosteronism. They all presented an imaging study (CT scan) compatible with a tumour of the adrenal cortex; in two patients the lesion was bilateral. One patient had a history of incidental adrenalectomy during an open colecistectomy performed some years previously.

Results: We operated on 16 patients, 13 of them women and 3 men, with a mean age of 55.4 years. We performed 18 laparoscopic adrenalectomies: 17 conservative operations and one total adrenalectomy of a 4.3 cm tumour in a patient with bilateral lesion. The mean duration of the operations was 70.9 minutes, with a mean bleeding rate of 30 ml. There were no complications or the need to resort to open surgery. Postoperative hospital stay was 2.8 days. In all the cases, the hypertension improved totally or partially.

Conclusion: Although small, the series confirmed that partial laparoscopic suprarenalectomy can be performed with good results and with the advantages of minimally invasive surgery.

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PALABRAS CLAVE
Hiperaldosteronismo;
Síndrome de Conn;
Laparoscopía;
Adrenalectomía parcial

Adrenalectomía parcial laparoscópica en hiperaldosteronismo primario

Resumen

Introducción: El hiperaldosteronismo primario es una de las pocas causas potencialmente curables de hipertensión arterial secundaria. Una de las variantes más importantes la constituye el adenoma de la corteza suprarrenal productor de aldosterona (Síndrome de Conn). El tratamiento de elección en este subgrupo de pacientes es la extirpación de la lesión. Se presenta una serie inicial de pacientes portadores de aldosteronoma sometidos a adrenalectomía parcial por vía laparoscópica.

Material y método: Se revisó la casuística de pacientes hipertensos sometidos a adrenalectomía parcial laparoscópica entre noviembre del 2001 y marzo del 2004, debido a hiperaldosteronismo primario. Todos presentaron estudio de imagen (tomografía computada) compatible con tumor de la corteza suprarrenal, y en 2 pacientes la lesión fue bilateral. Un paciente tenía antecedente de adrenalectomía incidental durante colecistectomía abierta efectuada años antes.

Resultados: Se operaron 16 pacientes, 13 mujeres y 3 hombres, con una edad media de 55,4 años. Se efectuaron 18 adrenalectomías laparoscópicas: 17 cirugías conservadoras y una adrenalectomía total en un tumor de 4,3 cm en una paciente con lesión bilateral. El tiempo operatorio medio fue 70,9 minutos, con un sangrado promedio de 30 ml. No hubo complicaciones ni necesidad de conversión a cirugía abierta. La estancia hospitalaria postoperatoria fue 2,8 días. En todos los casos hubo mejoría total o parcial de la hipertensión.

Conclusión: La serie, aunque pequeña, confirma que la suprarrenalectomía parcial por vía laparoscópica es reproducible, con buenos resultados y con los beneficios de la cirugía mínimamente invasiva.

Introduction

Primary hyperaldosteronism is one of the few potentially curable causes of arterial hypertension.[1-4] According to traditional literature, this condition causes hypertension in 1% of diagnosed patients; however, recent studies have shown that a directed investigation may establish the diagnosis of hyperaldosteronism in up to 10% of hypertensive patients.[2] In this subgroup of patients, it is estimated that between 20%-30% correspond to idiopathic hyperaldosteronism, frequently classified as primary hypertension. The rest, i.e., close to 70% are carriers of hyperaldosteronism associated with the presence of a functioning nodule of the suprarenal cortex (aldosteronoma), described by Conn in 1955.

The treatment of choice in these patients is resection of the lesion, which in the majority of them, is the definitive

Table 1 Characteristics of the patients

Case	Age	Sex	Side	Operation	Surgical Time (hours)	Hospital Stay (days)	Bleeding (ml)	Size (cm)
1	66	M	Left	Tumourectomy	120	10	50	1.5
2	59	F	Right	Excission	70	2	20	4.3
			Left	Tumourectomy	25	2	0	2.3
3	44	F	Left	Tumourectomy	75	1	10	2
4	49	F	Right	Tumourectomy	70	1	100	2.2
5	53	F	Right	Tumourectomy	50	2	50	2.2
6	63	M	Right	Tumourectomy	60	3	50	4
			Left	Tumourectomy	75	3	0	6
7	70	F	Left	Tumourectomy	120	2	50	1.8
8	44	F	Left	Tumourectomy	60	2	0	1.2
9	51	F	Right	Tumourectomy	55	3	0	2
10	40	F	Right	Tumourectomy	45	2	0	3.7
11	52	F	Left	Tumourectomy	40	2	0	1.2
12	46	F	Left	Tumourectomy	60	2	100	3
13	33	F	Left	Tumourectomy	60	1	0	2
14	44	F	Right	Tumourectomy	90	4	20	3
15	54	F	Right	Tumourectomy	60	3	30	2
16	67	F	Right	Tumourectomy	50	2	0	1.4

M: male, F: female.

treatment of their hypertension. The existence of a malignant lesion in these cases is extremely rare, so much so that surgery may be aimed at resectioning only the lesion and conserving the healthy gland. This is also the case in bilateral pheochromocytomas or in the context of genetic anomalies (Von Hippel-Lindau disease, Multiple Endocrine Neoplasia type 2).[1] In the last few years, laparoscopy has become the choice in suprarenal gland surgery, proving to be safe, efficacious and reproducible with very satisfactory postoperative evolution.[5] We present an initial experience of laparoscopic partial adrenalectomy in Conn's syndrome.

Materials and method

Between June 1993 and August 2010, we performed 316 laparoscopic adrenalectomies at our centre. Sixteen biochemically-confirmed patients with primary hyperaldosteronism were selected for conservative surgery. In all of them, the CAT scan clearly showed a well-delimited suprarenal gland. Two patients presented bilateral lesions and another had a history of an incidental right adrenalectomy, performed several years before in the course of an open cholecystectomy. The histological study of the adrenal lesion in this patient showed a 10 cm haemorrhagic pseudocyst. We have already described the surgical technique employed for laparoscopic access to the suprarenal gland.[5]

Briefly, it consists of the use of general anaesthetic, with nasogastric catheter and urethrovesical catheter, placed after inducing anaesthesia and removing them in the recovery room. We positioned the patient in full lateral decubitus and initiated pneumoperitoneum using a Veress needle in the subcostal position, putting the trocars in place. We dissected the suprarenal gland, identifying the gland and without clipping the vein. The parenchymal section can be performed with an ultrasonic scalpel (Ultrasicion ®, Ethicon-Endosurgery) or also by monopolar or bipolar coagulation. We extracted the tumour using a polyethylene bag through one of the incisions.

Results

We operated 16 patients, 13 women and 3 men, with a mean age of 55.4 (range 44-70) years. In total, we performed seventeen partial adrenalectomies and one total adrenalectomy. We performed the total adrenalectomy in a patient with bilateral lesion, on whom we performed conservative surgery of a 2.3 cm left lesion and right total adrenalectomy of a 4.4 cm lesion. The mean duration of the surgical procedure was 70.9 min. per operation (range 25-120), with a mean bleeding rate of 30 (range 0-100) ml. The mean hospital stay was 2.8 (range 1-10) days (table 1).

The mean size of the 17 suprarenal lesions on which conservative surgery was performed was 2.9 cm, with a range of 1.2 cm to 4 cm diameter the largest, measured in the anatomopathological study. There was no conversion to open surgery nor intra or postoperative complications. There was no mortality in the series. There was no clinical evidence of adrenal insufficiency and in all the patients with bilateral surgery, the postoperative study with cortisol measurement confirmed the presence of functioning adrenal cortical tissue. As regards the hypertension, 14 of 16 patients (87.5%) fully recovered and the remaining two significantly reduced their need for hypertension medication.

Discussion

The partial adrenalectomy is described principally for cases of bilateral pheochromocytoma or associated with Von Hippel-Lindau disease, in which case full resection results in adrenal insufficiency with all the inconveniences that this entails.[6] Access difficulties with traditional surgical techniques and the handling of a fragile and bleeding organ make conservative surgery particularly complex. The laparoscopic technique offers very good exposure of the gland, with minimum manipulation and excellent visibility.[5-8] Because it is a lesion of the cortex, aldosteronoma is generally peripheral and this has certain advantages over pheochromocytoma, which is more central, making it more accessible and easier to resection with this technique.[5] In our series, we used the transperitoneal technique in all the cases. Some series of partial adrenalectomies due to aldosteronoma have been performed by means of retroperitoneal laparoscopy with good results, although this case study is limited.[10, 11]

It is important that the instrument used for the dissection does not damage the tissue surrounding the tumour to guarantee the vitality of the remaining parenchyma. The technique was initially described with bipolar and fibrin coagulation, closing the defect with sutures. It can also be performed with mechanical sutures (Endo-GIA), however less precisely.[5,8] In our experience, sectioning with monopolar coagulation scissors or hook is equally effective, although the ultrasonic scalpel offers the advantage of a cleaner surgical field.

The control of the post-surgical cortical endocrine function with gammagraphy with marked aldosterol and with cortisol drugs prior to stimulation with ACTH[5,11,12] has been described. None of our patients clinically developed adrenal insufficiency. The control was performed with AM and PM cortisol measurement, which was normal, therefore no additional tests were carried out.

The experience arising from our series is quite limited, however, it reaffirms laparoscopy as the approach of choice in surgery of the adrenal gland, also with this indication.

Conflict of interest

The authors declare not to have any conflict of interest.

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