

# Diagnosis and management of suprarenal incidentalomas at Hospital Universitario Fundación Santa Fe de Bogotá: Experience over ten years

Francisco Javier Díaz, Freddy Jean Karlo Toloza Bonilla, Martha Catalina Morales, Maria Laura Ricardo, Manuel Enrique Cadena

## ABSTRACT

**Aims:** This article presents the experience in the diagnosis and surgical management of adrenal incidentalomas between 2005 and 2015, in a reference center of Bogotá, Colombia. **Methods:** Patients were selected for the data base available in the surgical operating rooms at Hospital Universitario Fundación Santa Fe de Bogotá, between January 2005 and January 2015. An analysis of medical records was made taking into account clinical and surgical variables, complications and patient follow-up. **Results:** A total of 50 medical records were included in the analysis. The middle-age population had a higher frequency compared with older population. Initial laboratory studies were conducted in 48–70% of the cases. Regarding the type of surgical approach, 10% of the adrenalectomy was performed by laparotomy, while 90% was performed through laparoscopic approach. Perioperative and postoperative complications were very low or absent in the overall study

population. **Conclusion:** It was reported a higher prevalence of functional mass, mainly, aldosterone-producing tumor, that was the less frequent in previous studies. The evident increase in the use of conventional laparoscopic opens a panorama to new indications, like a great size or worse malignant potential. Currently, laparoscopy represents the gold standard in the management for adrenal mass.

**Keywords:** Adrenal incidentalomas, Cushing syndrome, Myelolipoma, Pheochromocytoma

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## INTRODUCTION

Adrenal incidentalomas are defined as a mass greater than 1 cm in diameter on radiological study, specially computed axial tomography (CT) scan or magnetic resonance imaging (MRI) scan, realized in the context of a concomitant pathology [1]. Previously, it has been described a prevalence of 4.4%, but now it is approximately 10% due to the technological development

on diagnostic radiology [1]. The workup of adrenal incidentalomas includes imaging, chemistry and clinical issues that aim to determine the origin and behavior of these mass. About 89.7% of total mass correspond to non-functional adenomas; and in the group of functional masses, 6.7% presents a subclinical Cushing syndrome, 3.1% are pheochromocytomas, and only 0.6% debuts with Conn syndrome or hyperaldosteronism [2].

Regarding treatment, currently exists many surgical approaches, being today the transperitoneal lateral laparoscopy the most frequently used, looking for reduction in intraoperative and postoperative complications [3]. However, some variables argue the use of another approach, like laparotomy in the cases of higher malignant potential, a higher diameter (>10 cm) or a bilateral compromise on adrenal glands [4, 5].

This article exposes the prevalence of biochemistry, histologic, imaging and clinical characteristics of adrenal incidentalomas, and also the diagnostic and surgical approach most frequently used in the workup of adrenal incidentalomas on a surgery reference center at Bogota, Colombia.

## MATERIALS AND METHODS

### Selection of cases

Patients were selected for the database available in the surgical operating rooms at Hospital Universitario Fundación Santa Fe de Bogota. Inclusion criteria are patients scheduled for adrenalectomy for adrenal incidentaloma, between January 2005 to January 2015. Exclusion criteria: inability to access complete patient history.

### Analysis of medical records

The analysis of medical records of patients takes into account clinical variables, surgical variables, complications and patient follow-up. The analysis of medical records was conducted by three researchers independently. The information on the medical history will be obtained from the Integrated Health Care System HIS-ISIS; and medical records of private practices of physicians.

### Statistical analysis

SAS 5.1 was used for data analysis, a simple statistical analysis was conducted to estimate the prevalence of qualitative variables, percentage composition of the study population and the average of the qualitative continue variables. Similarly, chi-square tests were performed to determine associations between nominal variables.

## RESULTS

A total of 53 medical records of patients with initial surgical management of adrenalectomy for adrenal incidentaloma, were found during the study. For the analysis three patients are excluded: Two individuals belonging to the pediatric population and a subject because it was management commitment adrenal pathology, but not exactly an incidentaloma. At the end a total of 50 cases were included.

The gender distribution within the study cases was very similar, being slightly higher in women (54% versus 46%). In the distribution by age, middle-age population had a higher frequency of incidentalomas, being much lower in the extremes ages (Figure 1).

The biannual frequency of surgical management of incidentalomas had an upward trend since the beginning of the study period, with the highest peak in the last two years. The laparoscopic approach was more frequent and increasing trend, while the approach by laparotomy remained stable, with no more than two biannual cases in time to study (Figure 2).

### Clinical and laboratory evaluation

The most common clinical features were hypertension (76%), dyslipidemia (36%), symptoms or diagnosis of diabetes mellitus type II (26%), headache (20%) and palpitations (18%). It is important to note that these symptoms were evaluated after the incidentaloma diagnosis was made.

Initial laboratory study of the etiology was conducted between 48–70% of cases, mainly with measurements of serum or urinary catecholamines, aldosterone/renin ratio, 24-hour urine cortisol or low dose dexamethasone suppression test and serum dehydroepiandrosterone sulfate (DHEAS) (Figure 3).

No statistically significant dependence between the symptoms and the positive results of the laboratory evaluation ( $\chi^2 = 0.44$ ,  $p$ -value 0.5). Computed axial tomography was the most frequently radiological study used (78%) for incidentaloma diagnosis; followed by nuclear magnetic resonance imaging scan (18%) and abdominal ultrasonography (4%).

### Indication and surgical approach

The most common surgical indication was altered initial laboratory profile, followed by the severity of the clinical manifestations (Figure 4). Other indications of radiological nature were less frequent, as size >4 cm, irregular margins, highly vascularized and accelerated growth rate (> 2 cm/year).

Related to the type of surgical approach used, 10% of the adrenalectomy was performed by laparotomy (60% median laparotomy – Chevron' laparotomy 40%); while 90% was performed by laparoscopy. It is important to note that 10% of the laparoscopic approach was performed

through retroperitoneoscopy, an approach that has gained favoritism in recent years in the adrenalectomy.

### Pathological diagnosis

The diagnosis by histology showed that the most frequent diagnosis was the aldosterone or cortisol producer adenoma, followed by non-producing adenoma. Other diagnoses in order of frequency were pheochromocytoma, myelolipoma, carcinoma, metastases and other types of adrenal masses (Figure 5).

### Complications and postoperative follow-up

Perioperative and postoperative complications were very low or absent in the overall study population. Major bleeding occurred in 2% of cases and no cases of surgical site infection or recurrence of the disease during the follow-up period.

In the case of laparoscopic adrenalectomy was a statistically significant difference for risk of major bleeding in relation to approach by laparotomy ( $\chi^2 = 9.18$ ,  $p$ -value 0.0024). No statistically significant difference between the type of surgical approach and time of discharge was found. (Test  $t = 0.28$ ,  $p$ -value 0.78) (Figure 6).

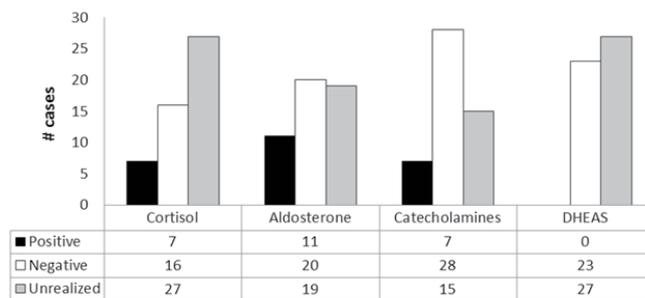


Figure 3: Distribution of laboratory evaluation.

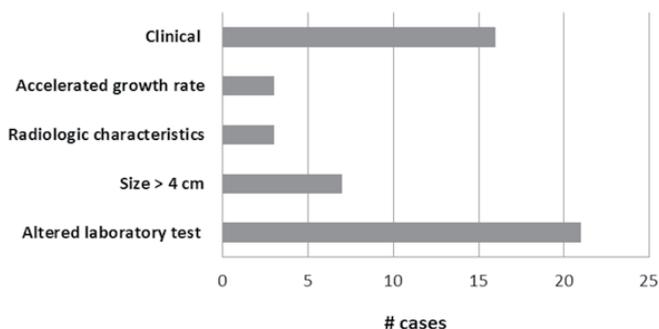


Figure 4: Distribution of clinical and paraclinical characteristics as surgical indication.

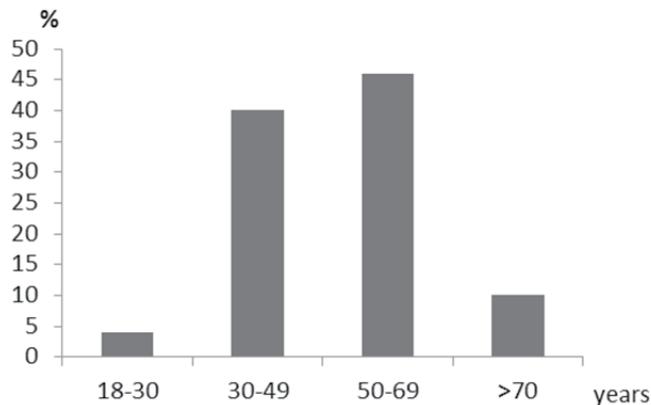


Figure 1: Distribution of the population by age.

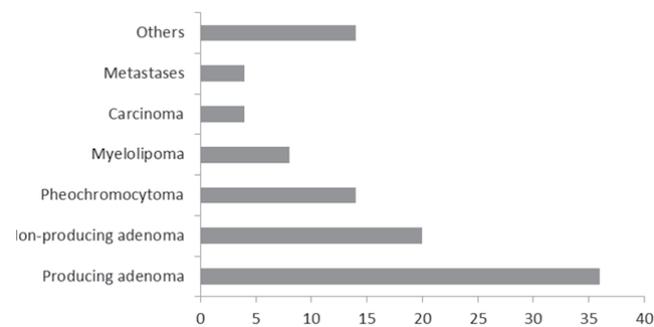


Figure 5: Histological diagnosis of surgical pathology.

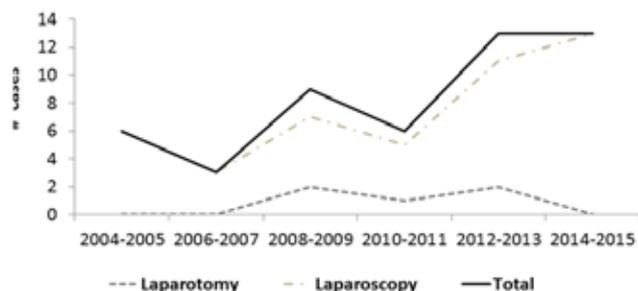


Figure 2: Total biannual distribution and by surgical approach of incidentalomas.

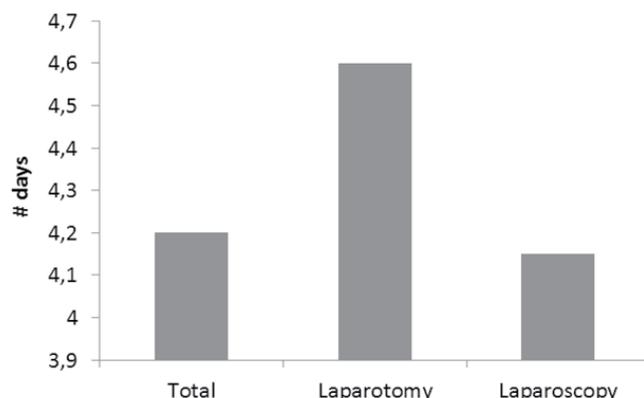


Figure 6: Hospital stay by type of surgical approach.

## DISCUSSION

The incidence of adrenal masses in terms of sex is similar to literature, being slightly more common in women. The age of great incidence is also consistent with prior studies [6]. Previously, the detection of adrenal masses on post-mortem analysis reports a prevalence of 8.7% [6]. However, nowadays the advent of better imaging methods allows an earlier and efficient diagnosis, moreover, a rapid management with the consequent reduction in long term complications. The most frequent image for diagnosis is the CT followed by MRI [6].

Over the ten years of following in our study, it has reflected the global trend to do interventions with a better impact in terms of morbid-mortality for Patients; the best example is the laparoscopic abdominal surgery. However, Germanin reported on 2011 that the size and malignant risk are predictors of a non-laparoscopic approach.

Also, a study accomplished by “Francophone Association of Endocrine Surgery (AFCE)” on 2007 showed that in incidental masses with a size great of 9 cm the frequency of laparoscopic approach decreases 30% [3]. In contrast, we report that the trend over the last years on HU-FSFB is to extent the laparoscopic approach the trend over the last years on HU-FSFB is to extent the laparoscopic approach regardless the size mass or malignant potential. The unique indications for laparotomy that persist are bilateral adrenal gland compromise. It lets make way to the continuous use of laparoscopic adrenalectomy as the standard method in the management of adrenal masses.

In contrast with literature, where the clinical manifestations represent the principal indications for surgery we show that the main reason for surgical management was the alteration in laboratory tests [7]. It can be explain for the nature of our institution as a reference center for diagnosis and management of adrenal masses, in which a great percent of patients had a previously clinical record and came with a specific treatment for their symptoms. However, clinical presentation and annual growth of masses are the most important features in decide the surgical management in patients [8].

In addition, we report the incidence of intraoperative and postoperative complications. It was evident the increase bleeding risk associated with the use of laparotomy compared with conventional laparoscopy. It is congruent with previous reports where the bleeding risk is higher with open approach versus laparoscopic surgery [9, 10]. The incidence of surgical site infection did not differ between both approaches in our study, but literature report an increase risk in the laparotomy group associated with the injury magnitude. There is no difference in hospital stay, we thing this can be related with the associated comorbidities of patients in both groups.

Finally, in the pathological diagnosis we showed a different trend in contrast with literature. We confirm

the higher prevalence of non-functional adenomas. But, in the group of functional masses we present more aldosterone producing adenomas, followed by cortisol producers. In the Cadwood study, the main functional mass present with a sub clinic Cushing syndrome and the last in prevalence was those that produce aldosterone [2].

## CONCLUSION

We present practical evidence about the workup, diagnosis and management of suprarenal mass. We confirmed previous information obtained in studies, that increased use of laparoscopic approach for the management of surgical abdominal conditions like adrenal incidentalomas leads to decrease incidence of complications like bleeding. We report the importance of extending the use of the laparoscopic approach, regardless of the mass size or malignant potential which were two contraindications in the past.

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## Author Contributions

Francisco Javier Díaz – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Freddy Jean Karlo Toloza Bonilla – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Martha Catalina Morales – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Maria Laura Ricardo – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Manuel Enrique Cadena – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

## Guarantor

The corresponding author is the guarantor of submission.

## Conflict of Interest

Authors declare no conflict of interest.

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