MedUNAB
ISSN: 0123-7047
ISSN: 2382-4603
medunab@unab.edu.co
Universidad Autónoma de Bucaramanga
Colombia

Parra-Serrano, Gustavo Adolfo; Torres-Langhammer, María Paula; Castillo-Díaz, Ana María; García-Ardila, María Emma; Serrano-Gómez, Sergio

Histopathological findings and malignancy of adrenal masses in a pathology and cytology center in Bucaramanga, Santander between 2007 and 2019

MedUNAB, vol. 24, no. 2, 2021, -November, pp. 155-161
Universidad Autónoma de Bucaramanga
Santander, Colombia

DOI: https://doi.org/10.29375/01237047.4054

Available in: https://www.redalyc.org/articulo.oa?id=71968598014

REVISTA DE LA FACULTAD
DE CIENCIAS DE LA SALUD

Vol. 24(2): 162-168, August-November 2021
i-SSN 0123-7047
e-ISSN 2382-4603

Original Article

Histopathological findings and malignancy of adrenal masses in a pathology and cytology center in Bucaramanga, Santander between 2007 and 2019

Hallazgos histopatológicos y malignidad de masas suprarrenales en un centro de patología y citología en Bucaramanga, Santander entre 2007 y 2019

Achados histopatológicos e malignidade de massas adrenais em um centro de patologia e citologia em Bucaramanga, Santander entre 2007 e 2019

Gustavo Adolfo Parra-Serrano, MD. Sp.[1], *María Paula Torres-Langhammer, St.*[2], *Ana María Castillo-Díaz, MD.*[3], *María Emma García-Ardila, MD. Sp.*[4], *Sergio Serrano-Gómez, MD. MSc.*[5]

1. Physician, Specialist in Internal Medicine and Endocrinology. Fundación Oftalmológica de Santander, Universidad Autónoma de Bucaramanga, Bucaramanga, Colombia.
2. Medical Student, Universidad Autónoma de Bucaramanga, Bucaramanga, Santander, Colombia.
3. Physician, Universidad del Rosario. Bogotá, Cundinamarca, Colombia.
4. Physician, Specialist in Pathology. Mega Patología y Citología, Bucaramanga, Colombia.
5. Physician, MSc in Epidemiology. Universidad Autónoma de Bucaramanga, Bucaramanga, Colombia.

Correspondence. Gustavo Adolfo Parra-Serrano. Calle 158 # 20 -55 consultorio 408 Floridablanca, Santander. Telephone: +57 3112306707. **Email.** gparra_serrano@hotmail.com

ARTICLE INFORMATION:

Article received: December 10, 2020
Article accepted: June 08, 2021
DOI: https://doi.org/10.29375/01237047.4054

Citation. Parra-Serrano GA, Torres-Langhammer MP, Castillo-Díaz AM, García-Ardila ME, Serrano-Gómez S. Histopathological findings and malignancy of adrenal masses in a pathology and cytology center in Bucaramanga, Santander between 2007 and 2019. MedUNAB. 2021;24(2):162-168 doi: https://doi.org/10.29375/01237047.4054

ABSTRACT

Introduction. Masses found in the adrenal gland can be classified according to their origin, behavior, location, function and manner of diagnosis. In Colombia there are insufficient data describing the frequency and main histopathological characteristics

DOI: https://doi.org/10.29375/01237047.4054 Vol. 24(2): 162-168, August-November 2021
Med UNAB
ISSN 0123-7047 Impreso
ISSN 2382-4603 Electrónico

of these lesions. The aim of this manuscript is to describe the main histopathological findings and malignancy of adrenal masses in a medical center specialized in pathology in Bucaramanga, Santander. **Methodology.** Descriptive and retrospective study. Pathologies of patients of all ages with histopathologic alterations in the adrenal gland were reviewed in a medical center in Bucaramanga, Santander. **Results.** Seventy-nine adrenal pathologies were reviewed, of which 39 showed adrenal gland lesions. The most frequent lesion found was metastasis (28.2 %), and the most frequent location of the lesion was in the right gland (62.1 %). **Conclusion.** It is essential that prospective studies be carried out to obtain epidemiological data in order to generate local data.

Keywords:
Malignancy; Pathology; Adrenal Glands; Neoplasm; Neoplasm Metastasis.

RESUMEN

Introducción. Las masas encontradas en la glándula suprarrenal pueden clasificarse de acuerdo con su origen, comportamiento, localización, función y forma de diagnóstico. En Colombia no existen datos suficientes que describan la frecuencia y las principales características histopatológicas de dichas lesiones. El objetivo del presente manuscrito es describir los principales hallazgos histopatológicos y la malignidad de las masas suprarrenales en un centro médico especializado en patología de Bucaramanga, Santander. **Metodología.** Estudio descriptivo y retrospectivo. Se revisaron patologías de pacientes de todas las edades con alteraciones histopatológicas en la glándula suprarrenal, en un centro médico de Bucaramanga, Santander. **Resultados.** Se revisaron 79 patologías suprarrenales de las cuales 39 presentaron lesión a nivel de la glándula suprarrenal, la lesión más frecuente encontrada fue la metástasis (28.2%), y la localización de lesión más frecuente se evidenció en la glándula derecha (62.1%). **Conclusión.** Es fundamental que se realicen estudios prospectivos que permitan obtener datos epidemiológicos con el fin de generar datos locales.

Palabras clave:
Malignidad; Patología; Glándulas Suprarrenales; Neoplasia; Metástasis de Neoplasia.

RESUMO

Introdução. As massas encontradas na glândula adrenal podem ser classificadas de acordo com a sua origem, comportamento, localização, função e forma de diagnóstico. Na Colômbia, não há dados suficientes que descrevam a frequência e as principais características histopatológicas dessas lesões. O objetivo deste artigo é descrever os principais achados histopatológicos e a malignidade das massas adrenais em um centro médico especializado em patologia em Bucaramanga, Santander. **Metodologia.** Estudo descritivo e retrospectivo. Foram analisadas patologias de pacientes de todas as idades com alterações histopatológicas na glândula adrenal, em um centro médico em Bucaramanga, Santander. **Resultados.** Foram revisadas 79 patologias adrenais, das quais 39 apresentavam lesão em glândula adrenal, a lesão mais frequente encontrada foi metástase (28.2%), e o local mais frequente de lesão foi evidenciado na glândula direita (62.1%). **Conclusão.** É imprescindível a realização de estudos prospectivos para obtenção de dados epidemiológicos a fim de gerar dados locais.

Palavras-chave:
Malignidade; Patologia; Glândulas adrenais; Neoplasia; Metástase de neoplasia.

Introduction

The adrenal gland is an endocrine organ located in the retroperitoneum. It has two main components: medulla and cortex, the former is responsible for the synthesis of catecholamines and the latter for the production of mineralocorticoids, glucocorticoids and androgens (1). The incidence and prevalence of adrenal masses have increased between the last 15 and 20 years, probably secondary to the development of more advanced imaging techniques and their frequent use, which allow for early visualization (2-4). It is extremely important to know the etiology, frequency, location and malignancy of these diseases in order to facilitate their diagnosis and treatment.

Adrenal masses can be classified according to their origin, behavior, location, function and manner of diagnosis. In most cases they are found incidentally, so they are called incidentalomas; defined as adrenal masses larger than one centimeter and characterized by being found during imaging studies in pathologies of non-adrenal etiology (1,2,5).

It is important to emphasize that the frequency of incidentalomas increases with age. It is rare to find them in people under 30 years of age and reaches a frequency of up to 7% in adults over 50 years of age (1,3,6). In addition to this, it is related to pathologies such as obesity, diabetes mellitus and high blood pressure (7,8).

International epidemiology is available, including the 2016 European Society of Endocrinology guidelines, which establish the histopathological prevalence of incidentaloma-type adrenal masses. It is evident that the most frequent mass is the non-functioning adenoma in up to 80% of the cases, followed by functioning adenomas, the most frequent being the cortisol-secreting in up to 12%. Additionally, there is pheochromocytoma 7%, adrenocortical carcinoma 8% and metastatic lesions 5% (9-11). In turn, a cross-sectional study carried out in a hospital in Brazil found that the prevalence of adrenal masses was 2.5%, being more frequent in men than in women and with a significant increase in prevalence at advanced ages (12) and found unilaterally in most cases, which is in agreement with the Argentinean clinical guidelines for the diagnostic and therapeutic evaluation of adrenal masses (8).

In Colombia and Latin America there are few studies describing the global distribution of the etiology of adrenal masses, the histopathological characteristics and the relationship with malignancy, which limits their diagnosis and effective clinical approach. Considering the clinical impact and the honest increase in the incidence of these masses, it is considered important to describe the main histopathological and malignancy findings of adrenal masses, determining the frequency of masses according to multiple variables such as sex and different age groups. It is essential to initiate and promote the study of adrenal masses in the Colombian population in order to obtain local epidemiology, which will improve diagnosis, treatment and prognosis.

Methodology

A descriptive and retrospective study was carried out, in which pathological studies of patients of all ages with adrenal gland pathologies performed at the Mega Pathology and Cytology center in Bucaramanga between 2007 and 2019 were reviewed. Cases were identified through a search of the institution's database using the term "adrenal gland". After reviewing the pathologies, a total of 79 pathologies were included in the study, of which 40 showed no alterations and 39 showed pathological changes of the adrenal gland. A data collection database was prepared, which took into account the diagnosis made by the pathologist, size and weight of the gland, location of the lesion, malignancy, and whether it was of primary or metastatic origin; likewise, sociodemographic variables such as sex and age were taken into account. The data obtained from the pathologies were collected in an Excel database and then grouped by age (over or under 65) and the length of the mass (over or under 4 cm). The statistical analysis was performed on Stata 15.0. Measures of central tendency and dispersion were used for quantitative measures, and qualitative measures were described by absolute and relative frequencies. Subsequently, a bivariate analysis was performed to determine whether there are associations between malignancy and other variables.

Results

For the study 79 adrenal gland pathologies were used, collected from January 2007 to October 2019, 39 (49.3%) of these reported histopathological findings and 40 (50.7%) were reported as normal. Men accounted for 62.3% of the pathologies performed at the institution. The rest of the results were analyzed taking into account only the 39 pathologies that had histopathological findings. With respect to age, it was evident that only 19.5% were patients older than 65 years, and the mean age was 55.2 years, with a range between 4 and 82 years. No significant age-related differences were found between men (55.4 years) and women (55 years). The most frequent location was in the right gland (61.2%), and it was observed that at a global level benign lesions are more frequent (58.9%) among which are pheochromocytoma (15.3%), cortical adenoma (12.8%), myelolipoma (7.6%) and adrenal hyperplasia (5.1%). However, it should be noted that the most frequent diagnosis is metastatic lesions (28.2%). A description of the demographic characteristics is included in Table 1.

Regarding the characteristics of the masses, the average length was 8.15 cm (with a range between 2-23 cm), the average height was 6.05 cm (with a range between 0.6-29 cm), and the average width was 3.9 cm (with a range between 0.5-10 cm). The mean lesion weight was 423.66 g

DOI: https://doi.org/10.29375/01237047.4054 Vol. 24(2): 162-168, August-November 2021

Table 1. Demographic characteristics of the population.

Lesion	Frequency (n=39)	Percentage (%)
Sex		
Men	48	62.3
Women	29	37.66
Age		
Under 65	29	80.5
Over 65	10	19.5
Location		
Right	23	62.16
Left	14	37.84
Malignancy		
No	23	58.97
Yes	16	41.03
Metastasis		
No	3	21.43
Yes	11	78.57
Diagnosis		
Metastasis	11	28.2
Pheochromocytoma	6	15.3
Cortical adenoma	5	12.8
Adrenocortical Carcinoma	4	10.2
Myelolipoma	3	7.6
Adrenal Hyperplasia	2	5.1
Paracoccidioidomycosis	2	5.1
Unclear diagnosis	2	2.5
Necrosis	1	2.5
Hemorrhage	1	2.5
Thrombosed Adenomatoid Tumor	1	2.5
Ganglioneuroma	1	2.5
Length		
Bigger than 4 cm	70	90.9
Smaller than 4 cm	7	9.09

Source: own preparation.

(range 11-2,025 g). These characteristics are summarized in Table 2. It was also observed that in tumors of primary origin the vast majority are non-malignant (82.1%), and in those tumors of metastatic origin the primary cancer is usually clear cell renal cancer (55.5%), followed by collecting duct renal cancer (22.2%); the rest of the distribution is depicted in Figure 1. Regarding malignancy according to sex, malignant masses in women were 36.8% and in men they accounted for 45%; this distribution is shown in Figure 2.

Table 2. General characteristics of the masses

Variable	Mean	SD
Length (cm)	8.15	5.15
Height (cm)	6.05	5.2
Width (cm)	3.9	2.43
Weight (gr)	423.66	2.43

Source: own preparation.

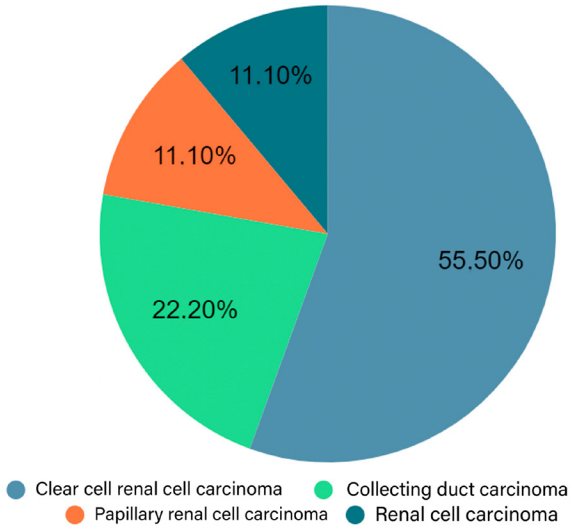

Figure 1. Distribution of tumors of primary origin in neoplasms of metastatic origin.
Source: own preparation.

When performing the bivariate analysis, associations were sought between the size of the mass (>4 centimeters) and its malignancy, without finding statistically significant relationships (p=0.339). When the association between age and malignancy was determined, it was found that patients older than 65 years had a significant association with malignancy (p=0.04). Regarding the association between malignancy and sex, no statistically significant differences were found (p=0.650).

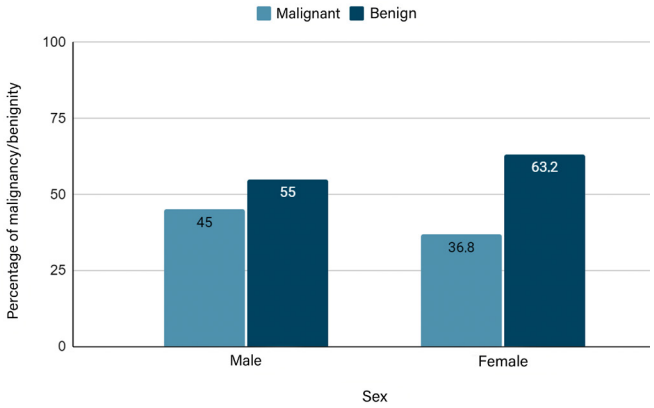

Figure 2. Relationship between the malignancy of masses and sex.
Source: own preparation.

Discussion

In this retrospective study, the characteristics of a group of 39 pathologies of the adrenal gland were evaluated, which made it possible to compare the results obtained with the international literature. These pathologies were performed in patients with suspected cancer; therefore, they are considered high-risk masses. Similarities were found in the epidemiology such as age, in international studies the incidence increases with age, presenting a peak after 50 years of age, which is consistent with the average age found in the study, which is 55.2 years. This is also found in studies conducted in Europe and Argentina (8,9). Additionally, the study also corroborates that the right adrenal gland is the most affected and that the presence of the mass is more frequent in men than in women, although the study did not present statistically significant associations, worldwide there are studies that demonstrate this (13,14).

Regarding histopathological diagnoses, it is important to highlight the significant frequency of metastatic lesions found in the study, as well as the primary origin of the tumor, which in this case was mostly of renal origin, clear cell. This is a relevant difference, since, internationally, the organ with the highest frequency of metastasis to the adrenal gland in most studies is the lung (16,17). However, melanoma has also been described as the main primary (18). It should be noted that metastases can also be of the breast, gastric, renal, colon and pancreas (17,19,20). This study presents data that reveal the distribution and behavior of adrenal gland lesions in the Colombian population, which is useful in clinical practice for differential diagnosis and therapeutic decisions.

Additionally, it was possible to evaluate the need for standardization in terms of pathology readings, since

DOI: https://doi.org/10.29375/01237047.4054 Vol. 24(2): 162-168, August-November 2021

some of these samples lacked fundamental data, from the age and sex of the patient to the detailed microscopic description and relevant immunohistochemical markers of each pathology, as for example in a study of urological pathologies developed in the United States of America, where they unified criteria for the description of the samples, which would be useful in clinical practice (15). Similarly, more studies with prospective follow-up data and integrating clinical variants are required for a deeper understanding of the pathology at the level of the adrenal gland specific to this region.

Conclusion

When describing the histopathological findings and the malignancy of the adrenal glands, it was found that variants such as age, sex and laterality of adrenal gland involvement, have similar frequencies with the epidemiology described worldwide. Although no statistically significant associations were found, new studies with prospective monitoring and integrate clinical data are considered necessary to better understand the behavior of these lesions and, in turn, continue with the generation of local epidemiology that allows improving the diagnosis, treatment and prognosis of these lesions.

Disclosure of sources of financing and potential conflicts of interest

No funding required.

No conflict of interest found.

Ethical Considerations

This is a descriptive observational study, conducted under the criteria and parameters established by Resolution 8430 of 1990. The study used medical and histopathological registry data collected at an institution in Bucaramanga between 2007 and 2019 and has the endorsement of the technical committee.

References

1. Betancourt VD, Archila EI. Tumores suprarrenales (Adrenal Tumors). Literature review. Acta Méd Centro [Internet]. 2014 [cited 17 Mar 2021]; 8(1):[aprox. 10 p.]. Available from: http://www.revactamedicacentro.sld.cu/index.php/amc/article/view/59/158
2. Arnaldi G, Masini A.M, Giacchetti G, Taccaliti A, Faloia E, Mantero F. Adrenal incidentaloma. Braz J Med Biol Res [Internet]. 2000 Oct [cited 2021 Mar 17]; 33(10): 1177-1189. https://doi.org/10.1590/S0100-879X2000001000007
3. Mannelli M, Colagrande S, Valeri A, Parenti G. Incidental and metastatic adrenal masses. Semin Oncol. 2010;37(6):649–61. https://doi.org/10.1053/j.seminoncol.2010.10.018
4. Long SE, Miller BS. Adrenocortical cancer treatment. Surg Clin North Am. 2019;99(4):759–71. https://doi.org/10.1016/j.suc.2019.04.012
5. Kloss RT, Gross MD, Francis IR, Korobkin M, Shapiro B. Incidentally discovered adrenal masses. Endocr Rev. 1995 Aug;16(4):460-84. https://doi.org/10.1210/edrv-16-4-460
6. Oliveira R, Salvador R, Buñesch L, Sebastià MC, Nicolau C. Manejo y diagnóstico del incidentaloma suprarrenal (Management and diagnosis of adrenal incidentaloma.). Radiology 2011;53(6):516-30. https://doi.org/10.1016/j.rx.2011.06.006
7. Román-González A, Agredo-Delgado V, Aristizábal-Barón J, Arizmendy-Acosta D. Prevalencia de mielolipoma como diagnóstico incidental de masas adrenales en tomografías abdominales realizadas en el Hospital Universitario San Vicente Fundación de Medellín (Prevalence of myelolipoma as incidental diagnosis of adrenal masses in abdominal CT scans performed at the Hospital Universitario San Vicente Fundación de Medellín). Iatreia. 2018 Dec [cited 2021 Mar 17]; 31(4): 342-350. Available from: http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S0121-07932018000400342
8. Gómez RM, Chervín R, Pardes EM, Lupi S, Surraco ME, Herrera J, et al. Evaluación diagnóstica y terapéutica del incidentaloma suprarrenal (Diagnostic and therapeutic evaluation of adrenal incidentaloma). Rev Argent Endocrinol Metab. 2016;53(2):51-8. https://doi.org/10.1016/j.raem.2015.12.001
9. Fassnacht M, Arlt W, Bancos I, Dralle H, Newell-Price J, Sahdev A et al. Management of adrenal incidentalomas: European Society of Endocrinology Clinical Practice Guideline in collaboration with the European Network for the Study of Adrenal Tumors. European journal of endocrinology. 2016 Aug;175(2):G1-G34. https://doi.org/10.1530/EJE-16-0467
10. Hevia M, Abascal JM, Boix P, Dieguez M, Delgado E, Abascal JM. et al. Manejo de la masa suprarrenal: lo que el urólogo debe saber (Management of adrenal mass: what the urologist should know). Actas Urol Esp. 2010 Ago [cited 2021 Mar 17]; 34(7): 586-591. https://doi.org/10.1016/j.acuro.2009.11.010

11. Vaidya A, Hamrahian A, Bancos I, Fleseriu M, Ghayee HK. The evaluation of incidentally discovered adrenal masses. Endocr Pract. 2019;25(2):178-92. https://doi.org/10.4158/DSCR-2018-0565
12. Ferreira E, Czepielewski M, Faccin C, Coral M, Furtado A.Prevalência de lesão adrenal incidental em pacientes submetidos a tomografia computadorizada de tórax e abdome em um hospital geral brasileiro. Arq Bras Endocrinol Metab. 2005 Out [cited 2021 Mar 17]; 49(5): 769-775. https://doi.org/10.1590/S0004-27302005000500017
13. Ctvrtlik F, Koranda P, Tichy T. Adrenal disease: a clinical update and overview of imaging. A review. Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub. 2014;158(1):23-34. https://doi.org/10.5507/bp.2014.010
14. Domínguez LE, Marín C, Díaz M, Jiménez A. Incidentaloma Suprarrenal: estado de la cuestión (Adrenal Incidentaloma: state of the matter). Cir Andal. March 2014 ;25(1):53–9. Available from: https://www.asacirujanos.com/admin/upfiles/revista/2014/2014-vol25-n1-act6.pdf
15. Hansel DE, Reuter VE. Adrenal Pathology in the Adult: A Urological Pathologist's Perspective. Advances in anat. 2016 sep;23(5):273–84. https://doi.org/10.1097/PAP.0000000000000120
16. de la Quintana A, Martínez G, Arana A, Prieto M, Álvarez I, Martínez L, et al. Cirugía de las metástasis en la glándula suprarrenal: resultados de una serie de 35 pacientes (Surgery for adrenal gland metastases: results of a series of 35 patients). Cir Esp. 2012;90(10):634-40. https://doi.org/10.1016/j.ciresp.2012.04.013
17. Alshahrani MA, Bin Saeedan M, Alkhunaizan T, Aljohani IM, Azzumeea FM. Bilateral adrenal abnormalities: imaging review of different entities. Abdom Radiol (NY). 2019;44(1):154-79. https://doi.org/10.1007/s00261-018-1670-5
18. Angelousi A, Alexandraki KI, Kyriakopoulos G, Tsoli M, Thomas D, Kaltsas G, et al. Neoplastic metastases to the endocrine glands. Endocr Relat Cancer. 2020; 27(1):R1–20. https://doi.org/10.1530/ERC-19-0263
19. Gupta P, Bhalla A, Sharma R. Bilateral adrenal lesions: Bilateral. J Med Imaging Radiat Oncol. 2012;56(6):636-45. https://doi.org/10.1111/j.1754-9485.2012.02435.x
20. Wagnerova H, Lazurova I, Felsoci M. Adrenal metastases. Bratisl Lek Listy. 2013;114(4):237-40. https://doi.org/10.4149/BLL_2013_049