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Case Report

Laparoscopic right adrenalectomy in a female with malignant hypertension secondary to pheochromocytoma: a case report

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ABSTRACT

Pheochromocytomas are uncommon adrenal tumors that can present considerable clinical difficulties because of their ability for catecholamine release and hypertensive crises. We report a case of a pheochromocytoma treated effectively with laparoscopic adrenalectomy. A 36-year-old woman was presented with secondary hypertension. Preoperative IV fluids, IV PPI's, blockade was initiated with antihypertensive drugs to optimize hemodynamic control. The patient had a laparoscopic adrenalectomy. Histopathological analysis confirmed the diagnosis of pheochromocytoma with presence of Zellballan pattern and pheochromocytoma of the adrenal gland scaled score (PASS). Complications were minimal, with low hemoglobin, and 1 unit of PRBC was transfused. Post operatively, blood pressure and electrolytes levels were normalized. Laparoscopic adrenalectomy shown to be a reliable and efficient method for treating pheochromocytoma, resulting in improved blood pressure regulation and quality of life for the patient. This case highlights the significance of a multidisciplinary strategy, encompassing preoperative medical optimization and diligent postoperative observation, in the management of pheochromocytomas, and contributes to the increasing evidence favouring laparoscopic adrenalectomy for these adrenal tumors.

Keywords: Laparoscopic adrenalectomy, Pheochromocytoma, Secondary hypertension, Adrenal tumours

INTRODUCTION

Pheochromocytomas are uncommon neuroendocrine tumors that arise from chromaffin cells in the adrenal medulla. Typically non-cancerous, yet around 10% are considered cancerous; the rate of cancer occurrence is between 2.5%-13%.[1] Tumors of the adrenal glands include various pathological conditions. These tumors consist of non-hormone-producing benign adrenocortical adenomas and hormone-secreting malignant types like adrenocortical carcinoma and adrenal medullary tumors, including pheochromocytoma.[2] Pheochromocytoma typically manifests with a classic triad of episodic headaches, sweating, and heart palpitations accompanied by high blood pressure. The triad occurs in approximately 40-80% of individuals with pheochromocytoma and is very sensitive and specific for the suspected diagnosis of the condition.[3] Radiologic localization is generally performed with contrast-enhanced CT (computed tomography) or MRI (magnetic resonance imaging), while PET-CT (positron emission tomography-CT) is utilized for extra-adrenal or metastatic conditions. Laparoscopic adrenalectomy continues to be the preferred surgical approach for pheochromocytoma located in the adrenal gland.[4] Timely diagnosis and treatment of pheochromocytoma is essential to avert severe complications such as hypertensive crisis and cardiomyopathy.[5] This article discusses a case of pheochromocytoma seen in our facility, emphasizing the characteristic clinical symptoms and treatment pathway in a 36-year-old woman diagnosed with malignant hypertension secondary to pheochromocytoma.

CASE REPORT

A 36-year-old woman presented with secondary hypertension and was diagnosed with a right adrenal mass pheochromocytoma. She has been admitted for surgical intervention. Upon examination, the patient was alert. Her vital signs at the time of admission were as follows: blood pressure at 140/90 mm Hg; heart rate at 110 beats per minute; respiratory rate at 16 breaths per minute; temperature 98.6°F and oxygen saturation at 98%. There was no notable family history of pheochromocytoma or other endocrine tumors. The physical examination revealed persistent hypertension.

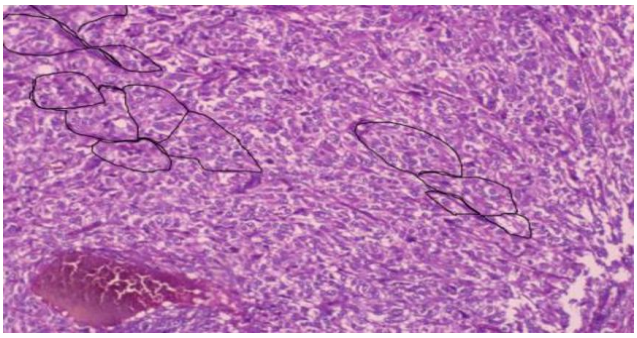

Figure 1: Zell Ballen pattern of pheochromocytoma.

The patient was admitted to the ward with a provisional diagnosis of right pheochromocytoma and surgery was planned. Whole body PET CT was done from vertex to mid-thigh after injecting 4 mci of Ga-68 DOTATATE which heterogeneously enhanced large necrotic mass lesion involving the right adrenal gland which is consistent with the clinical history of pheochromocytoma. Pre-operative care was initiated with intravenous fluids, intravenous proton pump inhibitors, antihypertensive medications and other necessary treatments.

Following pre-operative management, a laparoscopic right adrenalectomy was conducted. The excised right adrenal mass measured 7x6 cm. microscopic examination showed no periadrenal adipose invasion, no atypical mitoses was seen, no necrosis, no capsular and vascular invasion was observed. Histopathological examination of the extracted mass showed oval to elongated and spindle-shaped cells organized in nests and a Zellballen pattern (Figure 1). The individual cells were large and polygonal, displaying mild pleomorphism. These histopathological characteristics confirmed the diagnosis of pheochromocytoma. The pheochromocytoma of the adrenal gland scaled score (PASS) was 1.

The post-operative phase was stable. After surgery, she was transferred to the ICU for monitoring, where blood pressure, random blood sugar levels, and input-output charting were recorded; she was later moved to the ward after stabilizing for further care. Serial complete blood counts and electrolyte levels were monitored. Due to low hemoglobin levels, one unit of packed red blood cells was transfused, and regular follow-ups from surgical oncology and endocrinology were conducted. Gradually, a liquid diet was introduced, the Foley catheter and Ryle's tube were removed, and physiotherapy for ambulation was provided. The patient showed symptomatic improvement and is being discharged in stable condition. On follow up patient is doing fine with no complications.

DISCUSSION

The annual occurrence of pheochromocytoma is less than 1 per 100,000 individuals, while its prevalence is 1 in 6,500.[6] The usual peak age of diagnosis is the third to fifth decade of life, with equal occurrence in men and women.[7] Here, we discuss a case of a woman diagnosed with pheochromocytoma in her thirties, who comes to us with secondary hypertension and is found to have a right adrenal mass indicative of pheochromocytoma.

The treatment and management of pheochromocytoma can differ based on its risk, and decisions about surgery and follow-up care are made based on thorough evaluation. The adrenal gland may be the organ most appropriate for laparoscopic surgery due to its challenging position in the retroperitoneum, necessitating a significant open incision for removal. Since the first described laparoscopic adrenalectomy by Gagner et al, this approach has become increasingly used.[8] It has become the preferred method for treating most noncancerous adrenal lesions due to reduced blood loss, lower morbidity, shorter hospital stays, quicker recovery, and better cost-effectiveness relative to the open procedure.[9]

Sufficient fluid and salt consumption, in combination with alpha-blockers, are preoperative protocols suggested for patients having surgical resection to minimize peri-operative complications and death.[10] Surgeons and anesthesiologists must be particularly vigilant during the intraoperative phase since the patient is at risk for hypertensive crises, hypotension and arrhythmias resulting from tumor manipulation and the impact of anesthetic medications. Laparoscopic adrenalectomy is the favored technique for the surgical removal of tumors. Hypotension is a frequent issue in the post-operative phase, managed by quickly administering IV fluids.[11] Long-term follow-up is necessary for all patients with pheochromocytoma because of the chance of recurrence. Following surgery, plasma and/or urine metanephrines must be evaluated within 2-6 weeks.[12] The current patient received preoperative management with IV fluids and β-adrenergic blockade, which stabilized her hemodynamics and facilitated a smooth laparoscopic adrenalectomy. After the surgery, the patient stayed asymptomatic, with biochemical markers returning to normal, highlighting the success of timely diagnosis and suitable surgical treatment in handling pheochromocytoma.

A conclusive diagnosis of pheochromocytoma typically necessitates histological analysis and assessment by a skilled pathologist. Histopathological assessment of

pheochromocytomas generally shows a zellballen arrangement marked by clusters of chromaffin cells, these distinctive traits affirm the existence of pheochromocytoma.[13] Histological indicators of possible malignancy consist of a widespread infiltrative growth, invasion of blood vessels and capsule, necrosis of the tumor, heightened mitotic activity, cellular diversity, and elevated proliferative activity. Adrenal gland pheochromocytomas with a Scaled Score (PASS) <4 exhibited benign behavior, while all cases classified as malignant had a PASS ≥6. A PASS score ranging from 4 to 6 requires ongoing monitoring.[14] In our case, the histopathological characteristics showed a Zellballen pattern that supports the diagnosis of pheochromocytoma, and the PASS score was noted as 1, with no capsular invasion, no mitotic activity, and no tumor necrosis.

CONCLUSION

The results from this case strengthen the recognized advantages of laparoscopic adrenalectomy for adrenal tumors. The positive postoperative results, along with the low incidence of complications, indicate that this technique should remain the favoured surgical option for treating adrenal masses, especially in facilities with proficiency in minimally invasive surgery.

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REFERENCES

1. Yurt A, Arda MN, Vardar E. Metastatic pheochromocytoma of the thoracic spinal extradural space. Case report and review of the literature. Kobe J Med Sci. 2005;51(4):49-53.
2. Mihai I, Boicean A, Teodoru CA, Grigore N, Iancu GM, Dura H, et al. Laparoscopic Adrenalectomy: Tailoring Approaches for the Optimal Resection of Adrenal Tumors. Diagnostics 2023;13(21):3351.
3. Pacak K, Eisenhofer G, Ilias I. Diagnosis of pheochromocytoma with special emphasis on MEN2 syndrome. Horm Athens Greece. 2009;8:111-6.
4. Coste T, Caiazzo R, Torres F, Vantyghem MC, Carnaille B, Do Cao C, et al. Laparoscopic adrenalectomy by transabdominal lateral approach: 20 years of experience. Surg Endosc. 2017;31(7):2743-51.
5. Prejbisz A, Lenders JWM, Eisenhofer G, Januszewicz A. Cardiovascular manifestations of phaeochromocytoma. J Hypertens. 2011;29:2049-60.
6. Liu S, Song A, Zhou X, Kong X, Li WA, Wang Y, et al. Malignant pheochromocytoma with multiple vertebral metastases causing acute incomplete paralysis during pregnancy: Literature review with one case report. Medicine (Baltimore). 2017;96(44):e8535.
7. Guerrero MA, Schreinemakers JM, Vriens MR, Suh I, Hwang J, Shen WT, et al. Clinical spectrum of pheochromocytoma. J Am Coll Surg 2009;209(6):727-32.
8. Gagner M, Lacroix A, Bolté E. Laparoscopic adrenalectomy in Cushing's syndrome and pheochromocytoma. N Engl J Med. 1992;327(14):1033.
9. Miccoli P, Raffaelli M, Berti P, Materazzi G, Massi M, Bernini G. Adrenal surgery before and after the introduction of laparoscopic adrenalectomy. Br J Surg. 2002;89(6):779-82.
10. Eisenhofer G, Siegert G, Kotzerke J, Bornstein SR, Pacak K. Current progress and future challenges in the biochemical diagnosis and treatment of pheochromocytomas and paragangliomas. Horm Metab Res. 2008;40:329-37.
11. Garg MK, Kharb S, Brar KS, Gundgurthi A, Mittal R. Medical management of pheochromocytoma: Role of the endocrinologist. Indian J Endocrinol Metab. 2011;15:S329-36.
12. Young WF. Paragangliomas: Clinical Overview. Ann N Y Acad Sci. 2006;1073:21-9.
13. Munakomi S, Rajbanshi S, Adhikary PS. Case Report: A giant but silent adrenal pheochromocytoma-a rare entity. F1000Res. 2016;5:290.
14. Strong VE, Kennedy T, Al-Ahmadie H, Tang L, Coleman J, Fong Y, et al. Prognostic indicators of malignancy in adrenal pheochromocytomas: Clinical, histopathologic and cell cycle/apoptosis gene expression analysis. Surgery. 2008;143:759-68.

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