Article published online: 2020-12-30

Composite pheochromocytoma

Sir,

Mixed adrenal tumors composed of more than one cell type are uncommon, and they are called composite pheochromocytomas[1] and corticomedullary mixed tumors.[2] Composite pheochromocytoma is a well-defined neoplasm of the medulla and the tumor consists of both endocrine and neural components. Histopathologically, the endocrine portion is that of a pheochromocytoma, whereas the neural portion has been reported as ganglioneuroma, ganglioneuroblastoma, neuroblastoma, neuroendocrine carcinoma, or malignant peripheral nerve sheath tumor.[3]

Pheochromocytoma is usually characterized by a catecholaminergic effect with hypertension, whereas ganglioneuroma is a rare mature neuroblastic tumor that is typically non-metabolically active and so it is usually asymptomatic.[4,5] Here discussion is on an atypical case of 40-year-old female presenting with acute abdomen in the setting of undiagnosed huge pheochromocytoma. We also review the contribution of catecholamine hyper-secretion to patient's symptomatology.

A 40-year-old woman presented with complaints of abdominal pain and vomiting of 1-day duration. She was not a known hypertensive or diabetic. Hemogram reports revealed leukocytosis. Contrast enhanced computerized tomography (CECT) abdomen showed large multiseptated cystic lesion with hyper-dense solid appearing non-enhancing areas in the left suprarenal location suggestive of hemorrhagic left adrenal lesion [Figure 1a and b]. In view of adrenal tumors, 24-h urine was further evaluated for the presence of vinyl mandelic acid (VMA), metanephrine, and normetanephrine.

Lab values: Normetanephrine in urine: 900 µg/day (0-600 µg/d)
Metanephrine: 40 µg/day (0-350 µg/day)
VMA: 33 mg/day (upto 15 mg/day).

Thus, a diagnosis of normetanephrine-secreting pheochromocytoma was made.

Pre-operative management for adrenalectomy was carried out for 10 days and left adrenalectomy was done [Figure 2a and b]. She was discharged in a stable condition on day 5 after operation.

Histology revealed composite pheochromocytoma measuring 18 × 14 × 6 cm (pheochromocytoma + ganglioneuroma).

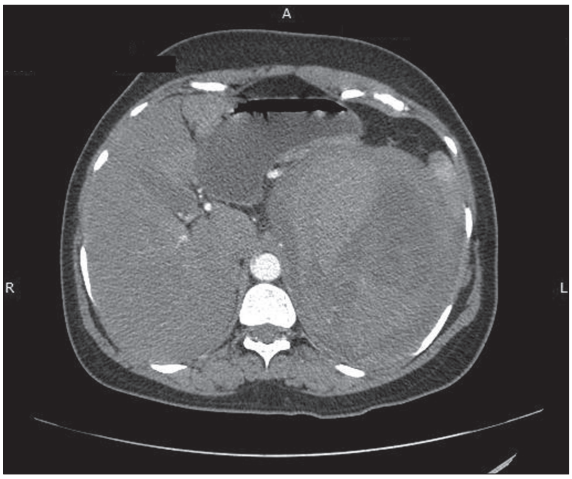

Figure 1a: Axial contrast-enhanced computed tomography (CECT) image of left adrenal tumor

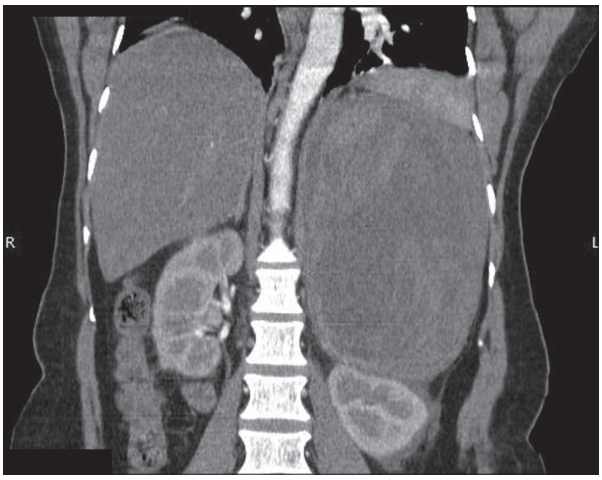

Figure 1b: Coronal contrast-enhanced computed tomography (CECT) image of left adrenal tumor

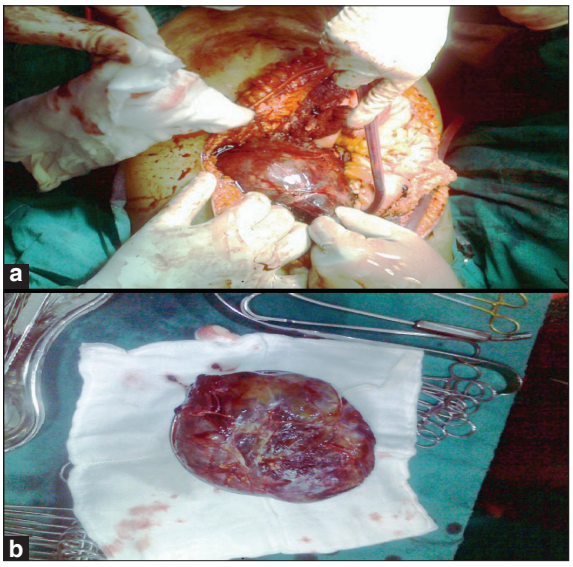

Figure 2: (a) Intra operative: Around 20 × 18 cm large hemorrhagic lesion in the left suprarenal location, (b)Left adrenalectomy specimen

Although pheochromocytoma may occur at multiple sites and in association with a number of other tumors, the presence of both pheochromocytoma and ganglioneuroma within a single tumor is extremely rare.[6-8] Although pheochromocytoma is a tumor that originated from the adrenal medullary chromaffin cells, ganglioneuroma represents a tumor from autonomic ganglion cells or their precursors. Embryologically, both chromaffin and ganglion cells are derived from neural crest cells and migrates to somatic areas.[9] The composite tumor has been used to describe tumors that theoretically arise from a common embryological progenitor, whereas mixed pheochromocytoma designate tumors have no common embryological ancestry.[10] In about 70% of composite adrenal medullary tumors, the accompanying second tumor component was ganlioneuroma.[11]

It is apparent that a composite tumor of pheochromocytoma and ganglioneuroma may display symptoms referable to hormonal hyper-secretion by either portion of the tumor.[6] Clinically, active pheochromocytoma may produce the classic symptoms of headache, palpitations, and excessive perspiration in 50% of the cases. In addition, hypertension, either sustained or paroxysmal, is the cardinal feature of pheochromocytoma.[12] Occasional normotensive patients with composite tumor may be explained by the theory of autonomic regulation by ganglioneuroma and it partially depends on the complex biochemical interaction and proportion of each elements.[13]

Both pheochromocytoma and ganglioneuroma commonly manifests radiologically as a well-defined smooth or lobulated mass with or without calcification. CT is accurate in detection of pheochromocytomas. Composite pheochromocytoma and ganglioneuroma show heterogenous radiological, gross, and microscopic features with varying admixtures of ganglioneuroma and pheochromocytoma components.[14]

Composite pheochromocytomas are rare catecholamine-producing tumor which has the propensity to large size which is unlikely when it is classical pheochromocytoma. Clinical manifestations unique to the tumor are occasional and atypical and non-specific symptomatology and its association with autoimmune disorders. A multidisciplinary approach involving anesthesia, endocrinology, and surgical expertise is the gold standard in maximizing patient care.

Rakesh Rai, Suhitha Gajanthody, Jnaneshwari Jayaram, Rajeev Kumar Chaudhry
Department of General Surgery, Father Muller Medical College, Mangalore, India

Address for correspondence: Dr. Suhitha Gajanthody
Father Muller Medical College, Mangalore, India

E-mail: suhith@rediffmail.com

References

1. Menon S, Mahajan P, Desai SB. Composite adrenal medullary tumor: A rare cause of hypertension in a young male. Urol Ann 2011;3:36-8.
2. Lau SK, Chu PG, Weiss LM. Mixed cortical adenoma and composite pheochromocytoma-ganglioneuroma: An unusual corticomedullary tumor of the adrenal gland. Ann Diagn Pathol 2011; 15: 185-9.
3. Gupta R, Sharma A, Arora R, Vijayaraghavan M. Composite pheochromocytoma with malignant peripheral nerve sheath tumour and rhabdomyosarcomatous differentiation in a patient without von Ricklinghaursen disease. J Clin Pathol 2009;62:659-61.
4. Choi EK, Kim WH, Park KY. A case of a composite adrenal medullary tumor of pheochromocytoma and ganglioneuroma masquerating as acute pancreatitis. Korean J Intern Med 2006;21: 141-5.
5. Ahn J, Lee SE, Chung YJ, Cli KC, Kim MK, Oh YS, *et al*. A case of papillary thyroid cancer and phrochromocytoma with ganglioneuroma. Korean J Med 2009;76:88-9.
6. Kragel PJ, Johnston CA. pheochromocytoma-ganglioneuroma of the adrenal. Arch Pathol Lab Med 1985; 109:470-2.
7. Moore PJ, Biggs PJ. Compound adrenal medullary tumor. South Med J 1995;88:475-8.
8. Okumi M, Matsuoka Y, Tsukikawa M, Fujimoto N, Sagawa S, Itoh K. A compound tumor in the adrenal medulla–pheochromocytoma combined with ganglioneuroma: A case report. Hinyokika Kiyo 2000;46:887-90.
9. Weston FA. The migration and differentiation of neural crest cells. Adv Morphog 1970;8:41-114.
10. Kino NR, Kim T, Lee JN, Eom YS, Chung DH, Park S, *et al*. Laparoscopically resected composite pheochromocytoma ganglioneuroma.EnM Endocrinol metab 2011;26:340-4.
11. George DJ, Watermeyer GA, Levin D, Epstein D, Ross SL, Scholz BO, *et al*. Composite adrenal phaeochromocytoma-ganglioneuroma causing watery diarrhea, hypokalaemia and arrhagic syndrome. Eur J Gastroenterol Hepatol 2010:22:632-4.
12. Manger WM, Glifford RW Jr. Clinical and Experimental Phrochromocytoma. 2nd ed. New York: Blackwell Scientific Publication Ltd.; 1996. p. 570.
13. Khan AN, Solomon SS, Childress RD. Composite pheochromocytoma-ganglioneuroma: A rare experiment of nature. Endocr Pract 2010; 16:291-9.
14. Lam KY, Lo CY. Composite pheochromocytoma-ganglioneuroma of the adrenal gland: An uncommon entity with distinctive clinicopathologic features. Endocr Pathol 1999; 10:343-52.

Access this article online

Quick Response Code:

Website: www.sajc.org

DOI: 10.4103/2278-330X.103727