ISSN: 2319-6505

Available Online at http://journalijcar.org

International Journal of Current Advanced Research
Vol 4, Issue 9, pp 371-374, September 2015

International Journal of Current Advanced Research

ISSN: 2319 - 6475

CASE REPORT

FUNCTIONAL CYSTIC PARAGANGLIOMA OF ABDOMEN: SURGICAL APPROACH AND PROGNOSIS

Rajya Lakshmi E*., Revanthkumar K., Jagadeesha B.V.C and Mahesh kariyappa

[1]Department of surgery, Jayadeva Jagadguru Murugarajendra Medical College, Davanagere

A R T I C L E I N F O

Article History:

Received 5 th, August, 2015
Received in revised form 16th, August, 2015
Accepted 15th, September, 2015
Published online 28th, September, 2015

A B S T R A C T

Paraganglioma are tumours arising from neuro endocrine cells , can arise from any part of the body. They present a difficulty in diagnosis in view of its rarity. Hence strong clinical suspicion should be present in diagnosing a case of paraganglioma1. Here we present one such case of abdominal paraganglioma, a cystic variety, a very rare presentation .

INTRODUCTION

Collections of neuroendocrine cells dispersed through out the body are known as paraganglia and the tumour arising from these paraganglia are known as paragangliomas.

The paraganglia based on their anatomic distributioncan be divided into three groups:

1. Branchiomeric
2. Intravagal
3. Aorticosympathetic

The aorticosympatheticparaganglia, as the name suggests, are located alongside of theabdominal aorta and are associated with the sympatheticnervous system. The paraganglia comprise chromaffin cells. They secrete and store catecholamines. Some of these paraganglia sense oxygen and carbon dioxidetensions within adjacent vessels, hence the tumours at timesare known as chemodectomas, glomus tumour.1

Case report

A 38 years old muslim female hailing from Karnataka, india presented with severe abdominal pain for past 2 days, radiating to the back, severe headache, vomiting, profuse sweating, and also impending doom of death.

She had been suffering from abdominal pain from past 1 year, which had been aggravated for past 2 days, and multiple episodes of vomiting containing partially digested food particles.

O/E: Concious, oriented, profuselysweating, wet palms.

Pr-120 bpm
B.P- 210 /140 mm hg
P/A: diffuse abdominal tenderness is present.
No mass was palpable
No free fluid present
No spinal tenderness present.

Ultrasonogram

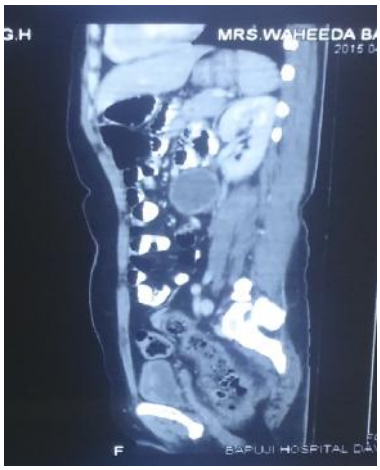
Mass lesion of 4* 5 cms, cystic mass, left to the aorta closer to the left kidney. No evidence of any aortic dissection.

Patient was diagnosed with hypertensive emergency and shifted for icu care , started on nitroprusside infusion .12 hrs following which patient was drowsy for which ct brain was done ,showed cerebral oedema without any intra cerebral haemorhage . In suspicion of functional paraganglioma Patient was started orally on tab labetalol 100mg bd after her urinary VMA levels came positive.

CECT abdomen

Cystic paraganglioma of 4.6* 4.7 cmssize, left to the aorta, abutting the aorta, with mild contrast enhancement.

Other investigations: vandylmandellic acid level-7mg /dl. As the patient are not affordable we could not proceed with metanephrine analysis.



01 Rim /Capsule is enhanced with Contrast

Surgical Technique

Right lateral position, left lateral flank incision of 10cms placed, layers opened up, whitish coloured mass lesion,

clearly demarcated by a capsule is noted lateral to aorta, blunt dissection with finger is done, plane created and the mass removed in toto. Haemostasis achieved. Tube drain placed. Intra operatively there is no rise of blood pressure on tumour manipulation.

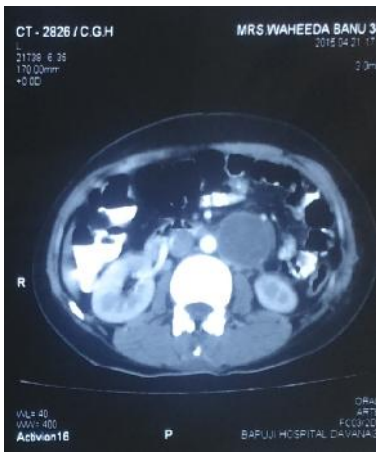


Figure 2 mass closer to vertebral body, aorta and left renal vessels

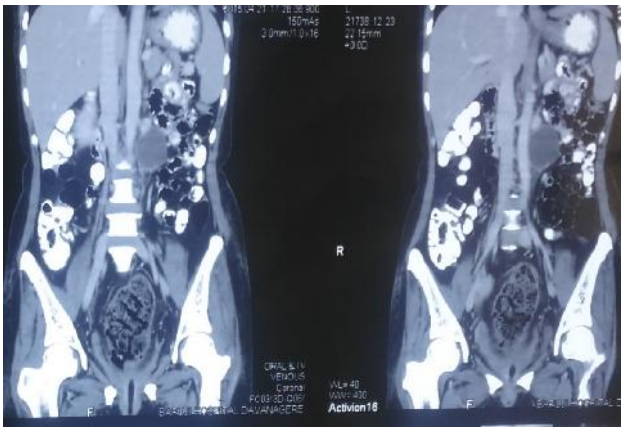


Figure 3 mass abutting the aorta

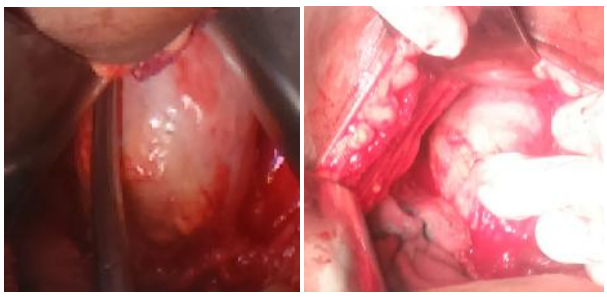


Figure 4

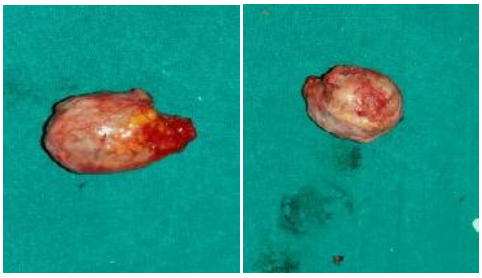


Figure 5

Gross pathology

Cut surface shows brownish material filled with in the cyst, with intact capsule.

Histopathology

Totally necrotic material filling the cyst.

Immunohistochemistry

Showed positivity for chromogranin/synaptophysin.

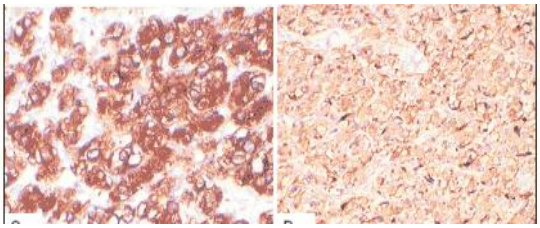


Figure 5

Post Op Course

Patient developed lymphatic leak which gradually decreased from 500ml of white milky fluid to 25ml, after 21 days the drain was removed.

DISCUSSION

Collections of neuroendocrine cells dispersed through out the body are known as paraganglia and the tumourarising from these paraganglia are known as paragangliomas. Some paraganglia are connected with the sympathetic nervous system whilst others are connected with the para sympatheticnervous system. This system is vital in foetal development until the formation of the adrenal medulla.

The first reported case of pheochromocytoma is attributed to Frankel in 1886. Alezais and Peyron describedextra-adrenal chromaffin tumors and called them paragangliomas in 1906. In 1912, Pick recommended thatintra-adrenal chromaffin tumors be called pheochromocytomas and that all extra-adrenal chromaffin tumorsbe termed paragangliomas. The first successful surgical resection of a pheochromocytoma was performed byRoux in 1926, and Mayo reported the first successful removal of a paraganglioma that same year [1].

Paragangliomas most commonly occurs in the 2nd and 3rd decade of life with a slight male preponderance which was not in our case. This is in contrast to adrenal phaeochromocytomas, which typically are diagnosed in the 4th and 5th decades with a slight propensity for women [2].

Although more properly known as paragangliomas, today these tumors are frequently called extra-adrenal pheochromocytomas (EAPs). The traditional teaching of the "10% rule," which noted that 10% of all pheochromocytomas are at extra-adrenal sites, may actually be an under estimation. A review of the literature suggests that EAPs actually constitute 15% of adult and 30% of pediatric pheochromocytomas [1]. The collection of paraganglia located anterolaterally to the distal abdominal aorta between the origin of the inferior mesenteric artery and the aortic bifurcation is called the organ of Zuckerkandl. Eighty-five percent of EAPs are located in the retroperitoneum, usually arising from the organ of Zuckerkandl. Less common sites reported include the bladder, thorax, neck, and pelvis [3. Much less common sites of disease presentation are the ciliary

ganglion, nasal cavity, larynx, trachea, periaortic region, and fallopian canal. Paragangliomas are the most common tumors of the middle ear and the second most common tumors of the temporal bone.

Functional Status

Paragangliomas characteristically present a lower level of catecholamine secretion than phaeochromocytomas, which usually cause clinical symptoms. Tumors localized in the urinary bladder, heart and paraaortic region secrete more often catecholamines. Tumors of the jugulotympanic region and carotisglomus rarely associate with clinical symptoms. In addition to catecholamines, paragangliomas synthesize a lot of hormones and neuropeptides. These are expressed with various incidence: metencephaline 73-75%, leu-encephaline 50-76%, VIP 0-43%, substance P 31-39%, corticotropine 0-28%, -MSH 11%, bombesine 11-23%, calcitonin 0- 11%, gastrin 0-39%, colecystokinine, glucagon, insulin, neurotensin 15%, neuropeptide Y 0-32%, pancreatic polypeptide 51-80%, somatostatin 28-90% [7,8,9].

Majority of the patients with extra-adrenal abdominal paraganglioma presented with complaints of abdominal painand/or a palpable abdominal mass, 8 however patients may beasymptomatic. Nausea, vomiting, diarrhoea, abdominaldistention and weight loss are the other symptoms reported bypatients with paraganglioma. Symptoms such as hypertension, flushing, sweating, headache, diaphoresis, anxiety, tachycardiaor palpitations are symptoms reported in patients withincreased catecholamine secretion in functional tumours.8-10

The diagnosis is confirmed by demonstrating elevated blood and urine levels of catecholamines and their metabolites [4]. Imaging studies to evaluate for EAPs include CT, MRI, and 131I-labelled metaiodobenzylguanidinescintigraphy. CT scan is useful for diagnosis while MRI has thehighest sensitivity in detection of extra-adrenal paragangliomasas well as pheochromocytomas.11, 12. Extra adrenal paragangliomas are rarely diagnosed in the preoperative period unless the lesion is functional. The diagnosis can be established by measuring24-hour urinary catecholamines, fractioned plasma catecholamines, and metanephrines. 6 Localization of the massis accomplished by several diagnostic methods. Computerized tomography (CT) and MRI are highly sensitive for detectingsmall tumors but are not specific to paraganglioma. 9Scintigraphic localization of both adrenal and extra adrenallesions has been accomplished by means of iodine 131metaiodo benzylguanidine (MIBG), a structural analogue ofnorepinephrine.10 MIBG scintigraphy is less sensitive thanCT and MRI but is highly specific for paragangliomas and adrenal pheochromocytomas.The tumors usually appear as rounded or oval masses with a similar density to the liver on unenhanced CT. Larger lesions may show a cystic component due to central necrosis or hemorrhage. Calcification is present in some cases. Owing to their hyper-vascularization, the tumors usually exhibit intense enhancement. The tumors are generally characterized by low T1 and bright T2 signal intensities. Central necrosis is frequently observed. There are no signal changes from out-of-phase to in-phase images. The measurement of plasma catecholamines is not recommended because this method has poor sensitivity and specificity, which often leading to false-positive results. Urine metanephrines have a higher specificity, receiver operating characteristic curves revealed a better test performance than other biochemical tests. [6] Special attention should be given to acetaminophen use, which interferes with assays and is a source of false-positive testing . The level of chromogranin A correlates with tumor mass.[7] Thorough preoperative pharmacological preparation, attentive intraoperative monitoring and aggressive surgical therapy all have an important role in achieving the safest and most successful outcome .[8]131I-MIBG and octreotide have high sensitivity and accuracy in diagnosing silent extra-adrenal PGL.

Immunohistochemistry & molecular genetics

Chromogranins are excellent indicatives ofneuroendocrine differentiation. Awell-differentiated tumor usually contains more granules than thosewith poor differentiation. The low level of chromograninsensitivity is a limiting factor for its diagnosticapplication. NSE and chromogranin togetherhave a sensitivity that approaches to 100% [5].Synaptophysin expression is not limited by thestage of differentiation, its monoclonal variant isvery sensitive and specific for neuroendocrinetumors.The extent of neuropeptide expression can beconsidered a putative prognostic factor. Poor expression of Ki-67 coincides with low mitoticactivity. The relative high presence of Bax, and adecreased expression of Bcl-2 may offer anexplanation for the benign behaviour of thesetumors, presumably for a high apoptotic rate. The classical familial syndromes is associated are multiple endocrine neoplasia type 2 (RET mutations), von HippelLindau disease (VHL mutations), hereditary PGL/pheochromocytoma syndromes (SDHx mutations) and rarely neurofibromatosis type 1 (NF1 mutations).[3]

The treatment of choice for a paraganglioma iscomplete surgical resection followed by a prolonged followup. This may be done by six monthly ultrasound or yearly CTscans. There is no specific recommended follow up strategy.

Malignant potential

Paragangliomas have a more aggressive coursethan their adrenal counterparts. Approximately20%-42% of paragangliomas metastasize, compared with only 2%–10% of adrenal pheochromocytomas (3). Dissemination occurs bothlymphatically and hematogenously, with the mostcommon sites of metastasis being the regionallymph nodes, bone, liver, and lung. Because benignand malignant paragangliomas have an identical histologic appearance, their clinical behaviour (eg, recurrent or metastatic disease) is the best predictor of the prognosis (3). The Malignant potential based on pathological characteristrics alone is not sufficient, although presence of capsular invasion and high mitotic index and molecular markers might help in predicting the malignant potential. Metastasis usually occurred from mean of 32 months to 10 years duration. metastasis usually occurs to lung, liver and bones. Genetic characteristrics of a tumour plays an important role in detecting malignant potential; positivity for SDHB mutation analysis. Predictors of malignancy in a paraganglioma includeextra-adrenal location, confluent tumour necrosis, vascularinvasion, local invasion,

coarse nodularity and absence ofhyaline globules,tumor weight more than 80 g and high concentration of dopamine inside the tumor, tumor size more than 5 cm (75% predictive).[3] Ki-67 proliferative index more than 6% is most common in malignant tumors.[12]

Treatment &prognosis

The mode of treatment is surgery: open / laproscopic.

Pre /post operative management of blood pressure, volume of the patient by using combined alfa beta blockers, beta blockers, adequate volume replacement are necessary to reduce the mortality / morbidity of the patient.

Once the correct diagnosis is acquired, surgical treatment should be carry out after using alpha-adrenergic blockade for 2-4 weeks in order to prevent and treat a syndrome of possible intra-operative catecholamine release. Tumors should be resected laparoscopically, if possible.

All paragangliomas should be regarded potentially malignant because of difficulty in confirming malignancy. Patients with malignant paragangliomascan only be cured by surgery.[2] The transabdominal approach is advised in large and malignant suspicious tumors.[3]The recurrence rate of paragangliomas are more than pheochromocytoma, therefore long term follow up is needed. Sometimes, preoperative diagnosis of renal or adrenal masses imposes some diagnostic dilemma, therefore complete preoperative evaluation is recommended.

Laproscopic approach has been proved be sucessful in complete resection of the tumour. But in the above case we performed open surgery. Intra operative difficulties like blood pressure fluctuation may happen during tumour mobilization, which needs aggressive blood pressure control .In the above case as the tumour is close the abdominal aorta, vascular surgeon help was asked in risk of aortic injury. But upon blunt dissection with fingers a separate plane was created and tumour excised without injuring the aorta.

Metastatic paraganglioma are treated with I 131 labelled MIBG, somatostatin analogues. Patients with high risk of malignancy are followed up by serial measurements of urinary metanephrines / urinary catecolamines.

We need a better understanding of the aggressive biology of these tumors and the development of metastatic disease as well as better and more effective systemic therapy. Additional data collection and study of paraganglioma is necessary to further elucidate the variable natural histories of these tumors and to define radiation dose-volume response chara. Future efforts should be directed toward obtaining a larger database to define the true natural history of extra-adrenal retroperitoneal PGLs. More prospective clinical trials are needed to provide the most reliable evidence regarding the management of patients.

CONCLUSION

Taken together, a heterogeneous, hypervascular, retroperitoneal mass with areas of necrosis with typical clinical setting of headaches, hypertension and tremor, is highly predictive of the presence of an extra-adrenal PGLs. All paragangliomas should be regarded potentially malignant because of difficulty in confirming malignancy. The only absolute indication of malignancy may be distant metastasis to the organs such as liver, bone and lymph nodes. Preoperative pharmacologic preparation, attentive intraoperative monitoring, and aggressive surgical therapy have important roles in achieving successful outcomes. Operative mortality is down to below one percent with adequate pharmacological Preparation. EAPs recur and metastasize more often than their adrenal counterparts, making life long follow-up essential.

References

1. Salanatri J, Smith P, Sclicht S: Multifocal malignant extra-adrenal paragangliomas of the organ of Zuckerlandl and urinary bladder. *Austral Radiol* 2001, 45: 229-232.
2. Lenders J, Pacak K, Walther W, *et al*: Biochemical diagnosis of pheochromocytomas: which test is best? JAMA 2002, 287:1427-1434.
3. Nobeyama I, Sano T, Yasuda K, Kikuchi C, Sone K, Kudo J, *et al*. [Case report onparaganglioma of the mesnterium.] Nippon Shokakibyo Gakkai Zasshi 2004; 101: 998-1003.
4. Rafique M, Bhutta RA, Muzzafar S. Case report: intra-renal paraganglioma masquerading as a renal cyst. *Int Urol Nephrol* 2003; 35: 475-8.
5. Shapiro B, Gonzalez E, Weissman A, McHugh T, Markel SF. Malignant paraganglioma of the prostate: case report, depiction by meta-iodobenzylguanidine scintigraphy and review of the literature. *Q J Nucl Med* 1997; 41: 36-41.
6. Tohya T, Yoshimura T, Honda Y, Miyoshi J, Okamura H. Unsuspected extra adrenal pheochromocytoma simulating ovarian tumor. *Eur J ObstetGynecol Reprod Biol* 1999; 82: 217-8.
7. Linnoila RI, Keiser HR, Steinberg SM, Lack EE. Histopathology of benign versus malignant sympatho adrenal paragangliomas: clinicopathologic study of 120 cases including unusual histologic features. *Hum Pathol* 1990; 21: 1168-80.
8. Sclafani LM, Woodruff JM, Brennan MF. Extraadrenal retroperitoneal paragangliomas: natural history and response to treatment. *Surgery* 1990; 108: 1124-30.
9. Lack EE, Cubilla AL, Woodruff JM, Lieberman PH. Extra-adrenal paragangliomas of the retroperitoneum: A clinicopathologic study of 12 tumors. *Am J SurgPathol* 1980; 4: 109-20.
10. Hayes WS, Davidson AJ, Grimley PM, Hartman DS. Extraadrenal retro peritoneal paraganglioma: clinical, pathologic and CT findings. *AJR Am J Roentgenol* 1990; 155: 1247-50.
11. Van Gils AP, Falke TH, van Erkel AR, Arndt JW, Sandler MP, van der Mey AG, *et al*. MR imaging and MIBG scintigraphy of pheochromocytomas and extradrenal functioning paragangliomas. *Radiographics* 1991; 11: 37-57.
12. Sahdev A, Sohaib A, Monson JP, Grossman AB, Chew SL, Reznek RH. CT andMR imaging of unusual locations of extra-adrenal paragangliomas.