Testicular Non-Metastatic Paraganglioma: The First Case Report

Testiküler Metastatik Olmayan Paraganglioma: İlk Olgu

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Geliş Tarihi / Received : **04.01.2019** Kabul Tarihi / Accepted : **20.05.2019**

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Abstract

Paragangliomas are tumors that develop from neural crest cells spread by the sympathoadrenergic neuroendocrine system. Our case is a testicular paraganglioma located exclusively in the testis and it is the first benign case in the English literature. A 60 years old male patient presented to our clinic with painless right scrotal mass. Preoperative scrotal ultrasound revealed a vascularized, mass lesion with two lobules completely filling the middle and lower right testis, measuring 40x24 mm in which anechoic cystic areas were observed. The patient then underwent right radical inguinal orchiectomy. Histopathologically and immunohistochemically, the diagnosis was testicular paraganglioma. Subsequent whole body-computerized tomography examinations revealed no suspicious lymph node or metastatic focus..
(Sakarya Med J 2019, 9(2):361-365)

Keywords Paraganglioma; testicular paraganglioma; testis

Öz

Paragangliomalar nöral krest hücrelerinden gelişir ve sempatoadrenerjik nöroendokrin sistem boyunca yayılır. Bizim olgumuz da sadece testis yerleşimli bir paraganglioma olgusu olup, benign vasıftaki literatürdeki ilk olgudur. 60 yaşında erkek hasta, ağrısız, sağ skrotal kitle şikayeti ile kliniğimize başvurdu. Preoperatif skrotal ultrasonda sağ testis orta ve alt polünü tamamen dolduran 40x24 mm boyutlarında kitle lezyonu izlendi. Hastaya sağ radikal orşiektomi uygulandı. Histopatolojik ve immünohistokimyasal inceleme sonucu testiküler paraganglioma tanısı konuldu. Ardından yapılan tüm vücut bilgisayarlı tomografi incelemelerinde herhangi bir şüpheli lenf noduna veya metastatik odağa rastlanmadı.
(Sakarya Tip Dergisi 2019, 9(2):361-365)

Anahtar kelimeler *Paraganglioma; testiküler paraganglioma; testis*

INTRODUCTION

Paragangliomas are tumors that develop from neural crest cells spread by the sympathoadrenergic neuroendocrine system.[1] Approximately 85% are intra-abdominal, 12% intrathoracic and 3% cervical.[2] 30% of the paragangliomas are malignant.[3] Extra-adrenal paragangliomas are rare and slowly growing neuroendocrine tumors.[4] Approximately 25-79% of extra-adrenal paragangliomas cause clinical findings related to catecholamine release, while the remaining portion constitutes clinically nonfunctional tumors.[5] Some of the rare regions for paragangliomas are kidney, urethra, bladder, prostate, spermatic cord, bile duct, uterus and vagina.[2]

The testis and spermatic cord are very rare regions for paragangliomas. Our case is testicular paraganglioma located in the testis and it is a very rare case. Up to now, nine cases of spermatic cord paraganglioma have been described in the international literature.[5-13] In another case, both the testis and the spermatic cord are involved and the tumor was metastatic.[14] When we review these nine literature, there is only one case of paraganglioma that is confined to the testis but not the spermatic cord.[15]

Our case is a testicular paraganglioma located exclusively in the testis and it is the first non-metastatic case in the English literature.

CASE DESCRIPTION

A 60 years old male patient presented to our clinic with painless right scrotal mass. A painless, firm mass lesion was palpated on the physical examination. The inguinal lymph nodes were not palpable. Malignant testicular tumor was considered at the first visit. Preoperative endocrine evaluation was not performed because there were no symptoms such as headache, diarrhea, palpitation and hypertension which would suggest catecholamine release. Tumor markers and other routine hematologic and biochemical markers were normal.

Preoperative scrotal ultrasound revealed a vascularized, mass lesion with two lobules completely filling the middle and lower right testis, measuring 40x24 mm in which anechoic cystic areas were observed. The patient then underwent right radical inguinal orchiectomy. Intraoperative hypertension and tachycardia did not occur.

Macroscopically, a right orchiectomy material measuring 5 x 2, 5 x 2 cm with a epididym having a length of 4 x 2 x 1 cm, a diamater of 1 cm and a 7 cm long spermatic cord with a diameter of 2 cm were detected. In the testis sections, there were nodular areas with a hemorrhagic and cystic appearance with a diameter of 0,5 cm and they were closer to capsule than 0.1 cm. Microscopically, there were no tumors in other paratesticular structures. The tumoral structure was separated by a distinct capsule from the parenchyma of the testis. It was noted that the tumor contained many vesicular structures and formed from stratified neoplastic cells. Neoplastic cells were observed to have mononuclear round oval nucleus with pale eosinophilic granular cytoplasm. Immunohistochemically; neoplastic cells were found to be vimentin, synaptophysin, CD56 positive. S-100 was expressing in the sustentacular cells surrounding the neoplastic cells. Chromogranin A, PLAP, CD117, Inhibin, Pansitokeratin, Desmin, SMA, D2-40, CD30, AFP, EMA, CD31, Glipikan were negative. (Figure 1, Figure 2) The result was reported as testicular paraganglioma.

In the postoperative period, metastasis and pathologic lymph nodes were not detected in thoracoabdominal computed tomography.

Figure-1

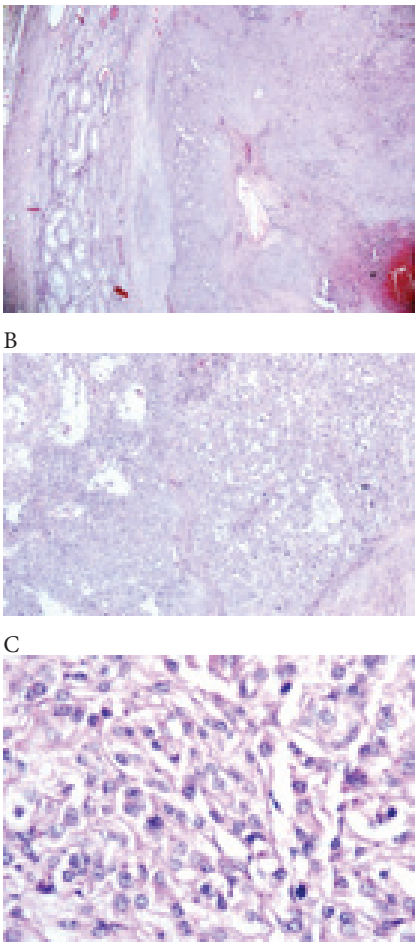

Figure-1. (A) Nodular tumor with occasional cystic areas adjacent to the testis (hematoxylin-eosin, original magnification,X20).(B) The tumor has a zell ballen pattern with nests of cells separated by fibrovascular septa (hematoxylin-eosin, original magnification,X40). (C) Abundant granular cytoplasm of the cells and stippled chromatin of the centrally-placed nuclei (hematoxylin-eosin, original magnification,X 400).

Figure-2

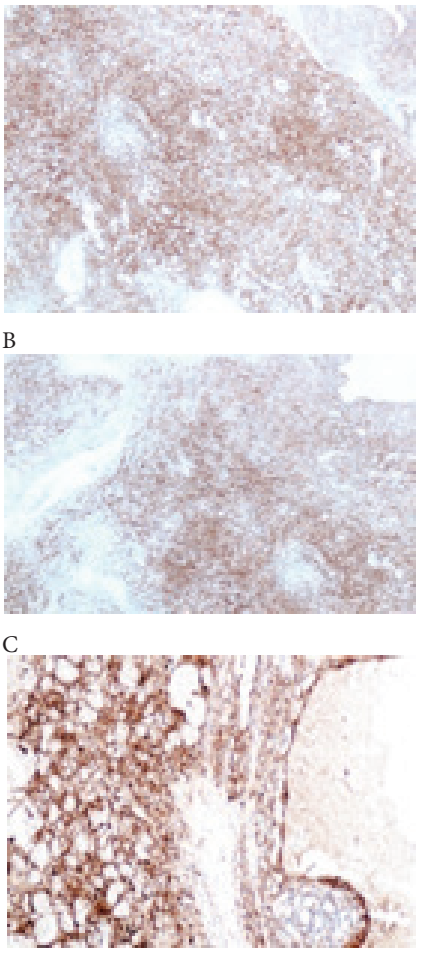

Figure-2. Immunohistochemical reactivity of the tumor cells (A) shows distinct immunoreactivity to synaptophysin, and (B) shows strong diffuse membrane reactivity to chromogranin A (C) shows distinct immunoreactivity to S-100 (avidin-biotin complex, original magnifications,X 100)

DISCUSSION

When most of the masses detected in the scrotal sac are localized to the testis and neoplastic, some are extratesticular and most of them originate from paratesticular tissues.[16] The formation of testicular paraganglioma can be explained by the presence of dysgenesis and paraganglionic origin during embryogenesis.[5-17] Paragangliomas present in various parts of the body usually have a good prognosis. Mitotic activity, necrosis and lymphovascular emboli may be among the poor prognostic factors. However, these features have been studied for bladder paraganglioma and are not reliable.[18] The only definitive malignancy criterion for paragangliomas is metastasis.[2] When the literature was examined, in the only case of testicular paraganglioma found exclusively in the testis, invading the testis and not the spermatic cord published by M C Makris

et al. the tumor was malignant and there was metastasis in lung and 2 cm lymph node of subdiyaphragmatic, but no lesion in other neural crest areas and adrenals.[15] No metastatic finding was found in our case. In addition, there were no lesions in neural crest regions and adrenals.

Paragangliomas may develop from embryonic chromaffin cells present in the testis. Metastasis from another region should be excluded.[2] Paraganglioma can be seen in paratesticular structures in infantile period. Rarely, heterotopic adrenal glands can be found in the descent path of the testis.[19-20] As a rule, these structures regress in childhood. In exceptional cases, they do not regress and can lead to neoplasia in these areas. Histologically, testicular paraganglioma can not be distinguished from the paragangliomas in other areas of the body. However, it must be distinguished from the other common benign and malign paratesticular and testicular lesions. The absence of gland-like spaces, cord and tubule structures showing not reactivity to keratin, WT1, and calretinine rule out a benign adenomatoid tumor. Normal tunica vaginalis, infiltrative, non-enlarging expansile lesion, absence of WT1, CEA and calretinin reaction rule out mesothelioma.

Melanotic neuroectodermal tumors are rare in testis and are seen in infants and produce HMB-45. I addition, Zell-Ballen's structural pattern showing strong immunoreactivity to CD56 and synaptophysin and the sustentacular cell patern showing immunoreactivity to S100 protein confirm the diagnosis of testicular paraganglioma.[21] Similarly, immunohistochemically, vimentin, synaptophysin, CD56 positivity were found in the neoplastic cells and S-100 positivity was found in the sustentacular cells surrounding these neoplastic cells in our case while diffuse CD56 positivity and patellar diffuse synaptophysin positivity were detected in the case of Makris et al.

Considering the tumor size, as noted in the case of Makris et al., In these rare cases metastasis is associated with tumor volume and early diagnosis and excision may be critical to the management of testicular paraganglioma and may be associated with survival of the patient. As a matter of fact, the tumor size was 17.5 cm × 10 cm × 9.5 cm in the case of Makris et al., Whereas our tumor was 4 × 2.4 cm.

In conclusion, our case is a rare nonfunctional primary testicular paraganglioma. According to our knowledge, this is the second case of pure testicular paraganglioma. Unlike the other case, it is the first non-metastatic paraganglioma limited to the testis. Radiologically, tumor can not be distinguished from paratesticular or testicular tumors, but after histopathologic diagnosis, the patient should be re-evaluated in terms of metastasis, lymph nodes and other probable lesions of neural crest areas.

References

1. *Erickson D, Kudva YC, Ebersold MJ, Thompson GB, Grant CS, vanHeerden JA, Young WF Jr 2001*
2. *Lack EE. Extra adrenal paragangliomas of the sympathoadrenal neuroendocrine system. Atlas of Tumor Pathology, Tumors of the Adrenal Gland and Extra Adrenal Paraganglia. 3rd ed. Bethesda, Md: Armed Forces Institute of Pathology; 1997; 269–284.*
3. *Lee JA and Duh QY. Sporadic paraganglioma. World J Surg 2008; 32: 683-687.*
4. *DeVita VT, Hellman S Jr, Rosenborg SA. Cancer Principles and Practice of Oncology. 2003; Chapter 29: 841- 847*
5. *Eusebi V, Massarelli G. Phaeochromocytoma of the spermatic cord: report of a case. J Pathol 1971; 105(4):283–284*
6. *Soejima H, Ogawa O, Nomura Y, Ogata J. Pheochromocytoma of the spermatic cord: a case report. J Urol 1977; 118(3):495–496*
7. *Bacchi CE, Schmidt RA, Brandao M, Scapulatempo R, Costa JC, Schmitt FC. Paraganglioma of the spermatic cord. Report of a case with immunohistochemical and ultrastructural studies. Arch PatholLabMed 1990; 114(8):899–901*
8. *Mashat F, Meccawi A, Garg S, Christian E. Paraganglioma of the spermatic cord. Ann Saudi Med 1993; 13(2):208–210*
9. *Attaran SY, Shakeri S, Sobhani AR. Paraganglioma of the spermatic cord: report of a case. J Urol 1996; 155(2):651*
10. *Young IE, Nawroz IM, Aitken RJ. Phaeochromocytoma of the spermatic cord. J Clin Pathol 1999; 52(4):305–306*
11. *Abe T, Matsuda H, Shindo J, Nonomura K, Koyanagi T. Ectopic pheochromocytom aarising in the spermatic cord 5 years after removal of bilateral carotid body tumors and adrenal pheochromocytomas. Int J Urol 2000; 7(3):110–111*
12. *Garaffa G, Muneer A, Freeman A, AbdelRaheem AM, Ralph DJ, Minhas S, Rees RW. Paraganglioma of the spermatic cord: case report and review of the literature. Sci World J 2008; 8:1256–1258*
13. *Alataki D, Triantafyllidis A, Gaal J, Rodiou C, Vouros J, Papathanasiou A, Papanicolaou A, Rombis V, de Krijger RR. VirchowsArch. A non-catecholamine-producing sympathetic paraganglioma of the spermatic cord: the importance of performing candidate gene mutation analysis. 2010;457(5):619-22.*
14. *Peng Xu, Zhichao Huang, YeqiNian , Mou Peng , Zhiguang Zhou , Lu Yi1 , Yijian Li. Malignant paraganglioma of testis and spermatic cord: a case report. Int J ClinExpMed 2017;10(10):14851-14855*
15. *Makris MC, Koumarelas KC, Mitrousias AS, Psathas GG, Mantzioros A, Sakellariou SP, Ntailiani P, Yettimis E. Endocrinol Diabetes Metab Case Rep. 2014;2014:140055.*
16. *Khoubehi B, Mishra V, Ali M, et al.Adult paratesticular tumors. BJU International 2002; 90: 707-15.*
17. *Glenner, G. G. And Grimley, P. M.:Tumors of the extra-adrenal paraganglion system (including chemoreceptors). Atlas of Tumor Pathology, 2nd series, fax. 9. Washington, D. C. Armed Forces Institute of Pathology 1974; 81-82,*
18. *Cheng L, Leibovich BC, Cheville JC, et al. Paraganglioma of the urinary bladder: can biologic potential be predicted? Cancer. 2000;88:844–852.*
19. *Nistal M, Paniagua R. Non-neoplasticdisease of the testis. Urologic Surgical Pathology, 2nd edn. Edinburgh: MosbyElsevier; 2008; 622-3.*
20. *Petersen R, Sesterhenn IA, DavisCJ:Urologic Pathology, 3rd edn. Philadelphia: Lippincott Williams & Wilkins 2009; 413-4.*
21. *Ruta Gupta, R. Spencer Howell, and Mahul B. Amin (2009) Paratesticular Paraganglioma: A Rare Cause of an Intrascrotal Mass. Archives of Pathology & Laboratory Medicine 2009; 133: 811-813.*