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Case Report

Teratoma with malignant transformation in Neuroendocrine Carcinoma-pathohistological and immunohistochemical analyses

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Abstract

We present a clinical case of 45 year old woman complaining of pain and heaviness in the pelvis region. A presacral multilocular cyst with size of 112 mm/97 mm was visualized on CT and MRI examinations. Following surgical removal of the cyst, the pathohistohistological examination confirmed mature teratoma with malignant transformation. The positive immunohistochemical expression to Synaptophysin, Chromogranin and Cytokeratin in the tumor cells cytoplasma confirmed the presence of neuroendocrine carcinoma/G2. After one year follow up, the disease progressed with distant metastases – one solitary hepatal metastasis and multiple bone metastases. A similar case of teratoma with malignant transformation was not found described in the accessible medical literature sources.

Introduction

The malignant transformation of a mature cystic teratoma (MCT) is a rare complication found in 0,17% - 2% of cases [1-4]. It has been published in clinical cases with ovarian [3], testicular [4,5], mediastinal and retroperitoneal teratomas [5]. The prognosis of the malignant transformation in MCT with distant metastases is inauspicious [3,4,6].

Clinical case

We present a clinical case of a 45-year-old woman complaining of pain and heaviness in the pelvic region. A presacral multilocular cyst with a size of 112 mm/97 mm was visualized on CT and MRI examinations (Figures 1 and 2).

In 2016, a radical extirpation was performed on the presacral cyst, as well as a hysterectomy with a bilateral adnexectomy.

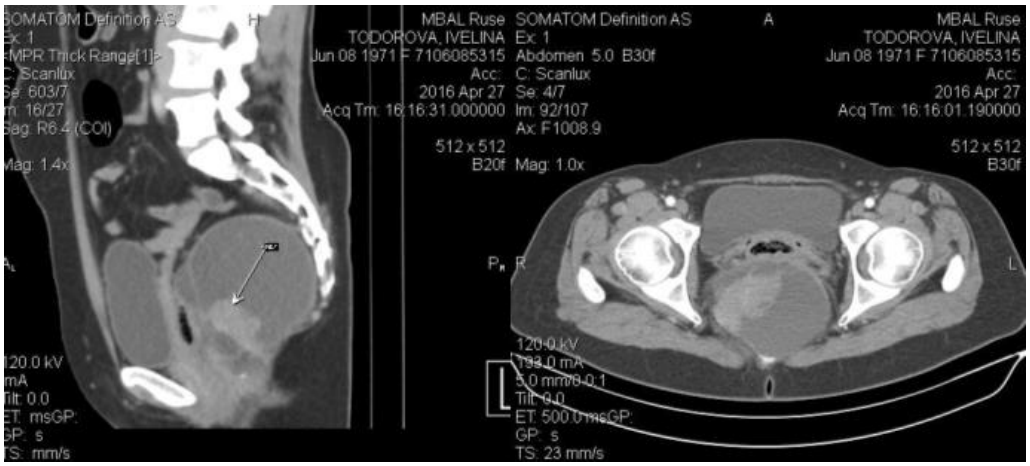

Table 1. CT of a presacral dermoid cyst with solid component

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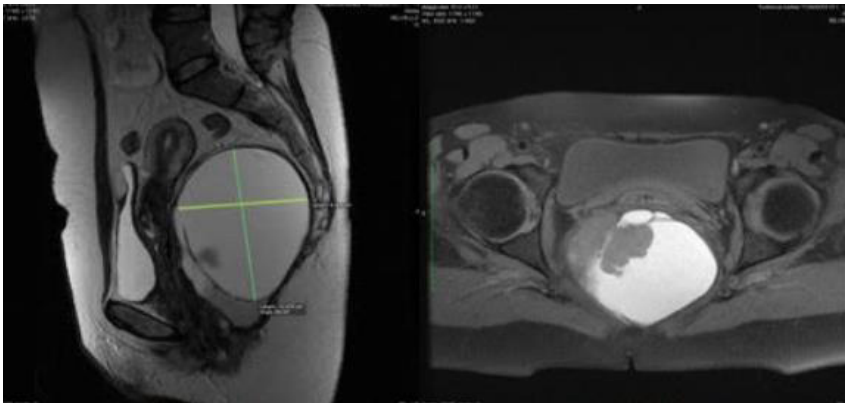

Figure 2. MRI of a presacral dermoid cyst

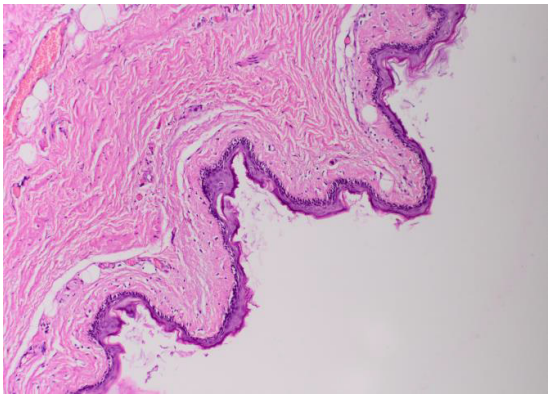

Figure 3. Photomicrography- A wall of a cyst covered with multilayered squamous epithelium with hair folliculus (H&E x20)

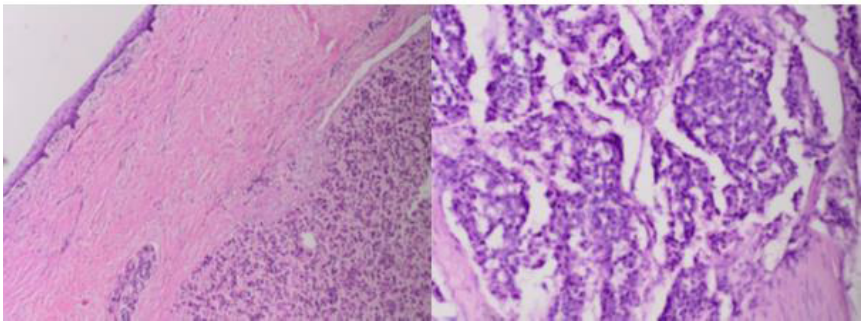

Figure 4. Photomicrography- atypical cells with granular eosinophil cytoplasm and oval, uniform nuclei with chromatin type "salt-pepper" without visible nucleoli (H&E x20)

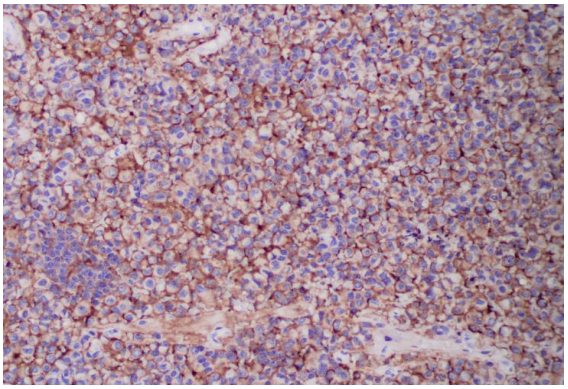

Figure 5. Photomicrography- IHC - strong diffuse immunoexpression of Synaptophysin in the cytoplasm of the tumour cells

Pathohistological examination

A wall of a cyst covered with multilayered squamous epithelium with hair folliculus with areas of erosion, haemorrhages, subepithelial chronic inflammatory infiltrates (Figure 3).

There are focuses, nets and islands of areas with tubuloacinar and rozete-like structures amongst the fibrous tissue. The same ones are presented with atypical cells with granular eosinophil cytoplasm and oval, uniform nuclei with chromatin type "salt-pepper" without visible nucleoli (Figure 4). The mitotic activity is less then 20/10 HPF. There are tumor embolus in some of the lymphatic vessels, perineural and perivascular invasion.

Immunohistochemistry (IHC) - The tumour cells show strong diffuse immunoexpression of Synaptophysin in the cytoplasm (Figure 5), weak expression of Chromogranin in the cytoplasm (Figure 6), strong diffuse immunoexpression to Cytokeratin clone AE1/AE3 in the cytoplasm (Figure 7) and negative reaction to S100 and Desmin. Index of proliferation Ki 67 - 13,1% (Figure 8).

Based on the morphology and the IHC, it can be accepted that it is probably a neuroendocrine carcinoma/G2 witch has appeared after malignant transformation of the rectorectal dermoid cyst.

Pathological changes are missing in the uterus, the adnexa of uterus and the ovaries. The patient has been hospitalized in an oncological dispensary. In 2017, a lesion in the right tube of the liver with the size of 30 mm, has been established by CT. A microwave thermoablation on the liver metastasis has been performed. 3 months later, multifocal osseous osteosclerotic metastases have been established by osseous scintigraphy. The patient has been through a treatment with Sandostatin and Zoledronic acid. At the moment, she has a stable disease.

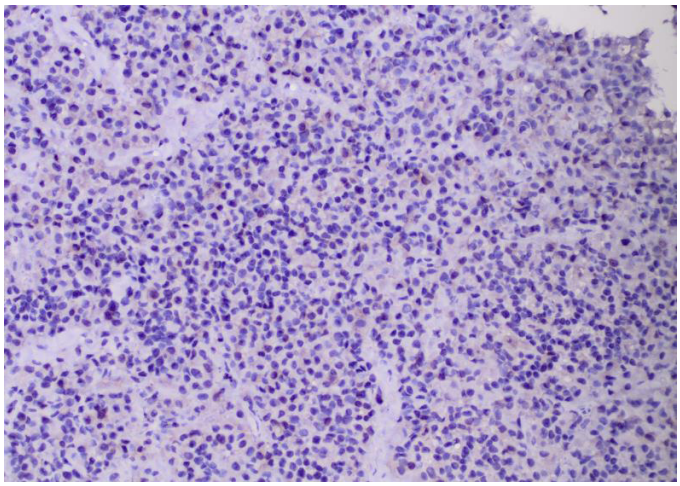

Figure 6. Photomicrography- IHC- weak expression of Chromogranin in the cytoplasm of the tumour cells

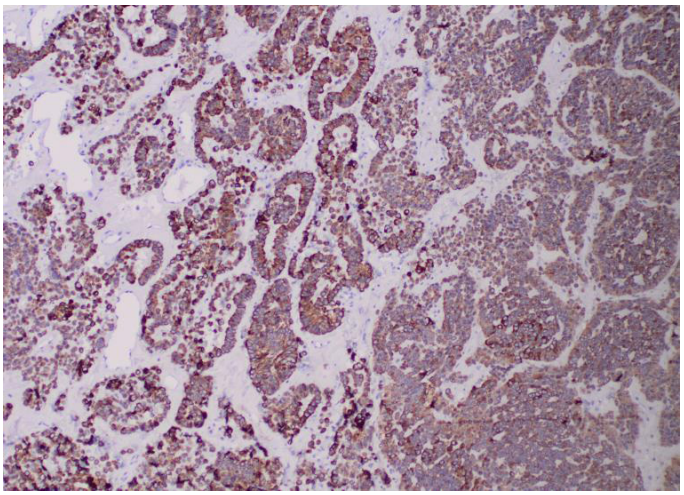

Figure 7. Photomicrography- IHC- strong diffuse immunoexpression to Cytokeratin clone AE1/AE3 in the cytoplasm of the tumour cells

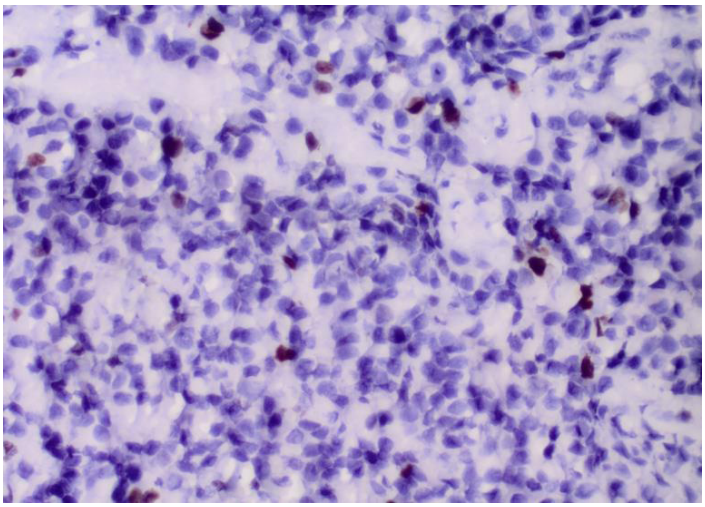

Figure 8. Photomicrography IHC index of proliferation Ki 67 - 13,1%

Discussion

The teratomas with malignant transformation are a type of germ cell tumours in witch the somatic teratomic component has been transformed into an identical somatic neoplasm (sarcoma or carcinoma), viz. there occurs a morphological malignancy with an aggressive cellular proliferation [5]. Although all the tissues in the teratoma (ectoderm, mesoderm and endoderm) have potential for malignant transformation, the most common carcinoma is the spinocellular [3]. Other, not that common tumors (0,2%-1,4%) which occur in the mature cystic teratoma, are adenocarcinomas [7], basal cell carcinoma, adenosquamosus carcinoma, thyroid carcinoma, sebaceous carcinoma, malignant melanoma [7], sarcoma [4,5], carcinoid tumor and neuroectodermal tumor [2,5]. Ovarian mature cystic teratomas with malignant transformation, with the frequency of 1%-2%, have been published in medical literature. The average age of affected patients is 55 years and the diameter of the cyst is between 30mm and 400mm [1]. The chance of malignancy depends on the age of the patient is higher in postmenopausal women, and highest for women who are between 50-60 years old [8]. The presented clinical case is about a presacral cystic teratoma, with the size of 112mm/97mm, with a solid component visible on CT and IMR (Figure 1 and 2). The solid component in the cyst is one of the signs for malignant transformation.

The diagnosis neuroendocrine carcinoma is being established after a strict pathohistological and IHC-analysis. Neuroendocrine tumors (NET) originate from neuroendocrine cells which: 1/ can produce neurotransmitters; 2/ have dense nucleus and secretory granules; 3/ do not have axons and synapses [10]. Most of the neuroendocrine cells are scattered in the mucosa of the digestive and respiratory system, and they form the big endocrine "organ" of the human body [11]. They are located in all of the organs, the skin and mucosal membranes, so that NETs can originate from almost every part of the human body [11]. NETs can occur in all the organs and tissues, as well as where are not usually any neuroendocrine cells [12].

The conventional pathohistological microscope research of the surgical establishes atypical cells located in the nests, the focuses and the solid structures, mainly between small and average in size cells with big hyperchromatic, in part vesicular nuclei with prominent nucleoli and atypical mitoses. The cytoplasm is eosinophil and granular. The nuclei of the tumor cells consist of chromatin type "salt-pepper". It is typical for tumour cells to be scattered like "rozets" (Figures 3 and 4).

The precise diagnosis requires IHC- analysis with specific tumor markers for identifying the phenotype of the tumor cells (12). The family of NETs expresses Sinaptophysin as a typical IHC-marker (Figure 5). Based on the availability of Citokeratins (Figure 7) or neurofilaments, those tumors separate into epithelial and neural subtype [13]. For proving the neuroendocrine cell characteristics, the tumor cells are being examined by IHC panel, which includes CD56, Sinaptophysin and Chromogranin A [14]. They are the main IHC-markers for proving the neuroendocrine neoplasms, but it must be noted, that they are being expressed in 30-50% of clinical cases [15].

Conclusion

IA very rare case of a mature cystic teratoma, with malignant transformation into a neuroendocrine carcinoma, is being presented. A similar clinical case can not be found in the English medical literature. An IHC panel, which includes Sinaptophysin and Chromogranin A, must be used for proving the neuroendocrine cellular phenotype. A radical surgery, followed by a continuous monitoring, must be enforced in cases of a localized disease.

References

1. Hackethal A, Brueggmann D, Bohlmann MK, et al. Squamous-cell carcinoma in mature cystic teratoma of the ovary: systematic review and analysis of published data. Lancet Oncol. 2008;9(12):1173–1180.
2. Mandal S, Dhingra K, Gupta P, Khurana N. Rare growth of a psammomatous meningioma in a mature ovarian Teratoma: a case report. Pathol Res Pract. 2010;206(5):322–324.
3. Mandal S, Bhawana A. Badhe. Malignant transformation in a mature teratoma with metastatic deposits in the omentum: a case report. Case Rep Pathol. 2012; 2012: 568062 .
4. Wang J, Kazmi SA. Teratoma with malignant transformation: a case report with pathological, cytogenetic, and immunohistochemistry analysis. Sarcoma. 2011;2011:450743.
5. Motzer RJ, Amsterdam A, Prieto V, et al. Teratoma with malignant transformation: diverse malignant histologies arising in men with germ cell tumors. J Urol. 1998; 159(1):133-138.
6. Ulbright TM. Germ cell tumors of the gonads: a selective review emphasizing problems in differential diagnosis, newly appreciated, and controversial issues. Modern Pathology. 2005;18(2):S61–S79.
7. Kikkawa F, Ishikawa H, Tamakoshi K, et al. Squamous cell carcinoma arising from mature cystic teratoma of the ovary: a clinicopathologic analysis. Obstet Gynecol. 1997; 89(6):1017-1022.
8. Gordon A, Rosenshein N, Parmley T, Bhagavan B. Benign cystic teratomas in postmenopausal women. Am J Obstet Gynecol. 1980;138(8):1120–1123.
9. Futagami M, Yokoyama Y, Mizunuma H, et al. Is the malignant transformation of mature cystic teratoma predictable before operation? Aomori Rin San Fu Shi, 2011; 26:59–65.
10. Langley K. The neuroendocrine concept today. Ann NY Acad Sci 1994; 15:1-17.
11. Feyrter F. Uber diffuse endocrine epitheliale Organe. Leipzig,Germany JA Barth 1938.
12. DeLellis RA, Tischler AS. The dispersed neuroendocrine cell system. In: Kovacs K, Assa SL, eds. Functional Endocrine Pathology. 2nd ed. Malden,MA . Blackwell Scientific; 1998:529-549.
13. Weidenmann B, Frank WW, Kuhn C, et al. Synaptophysin: a marker protein for neuroendocrine cells and neoplasms. Proc Natl Acad Sci USA 1986;83:3500-3504.
14. Loy TS, Darkow GV, Quesenberry JT. Immunostaining in the diagnosis of pulmonary neuroendocrine carcinomas. An immunohistochemical study with ultrastructural correlations. Am J Surg Pathol 1995, 19: 173-182.
15. Guinee DG, Jr., Fishback NF, Koss MN, et al. The spectum of immunohistochemical staining of small cell lung carcinoma in specimens from transbronchial and open-lung biopsies. Am J Clin Pathol 1994; 102: 406-414.