

Mature cystic teratoma with predominately neurogenic elements – case report

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Background: Mature cystic teratomas of the ovary are the most common germ cell neoplasms. Teratomas consist of a number of histologic types of tissues, all of which contain mature or immature tissues. Typically mature tissues have ectodermal (skin, brain), mesodermal (fat, muscle), and endodermal (mucinous or respiratory epithelium) origins. In monodermal teratomas, one of these tissue types predominates (eg, thyroid tissue in struma ovarii, neuroectodermal tissue in carcinoid tumor).

Case report: A 25-year-old woman with a left ovarian mature cystic teratoma, that mostly composed of neurogenic elements including glial tissue, melanotic cells, ganglionic cells, peripheral nerve and choroid plexus, was reported.

Conclusion: Mature cystic teratomas are composed of well-differentiated derivatives of the three germ cell layers, with ectodermal elements predominating. In this paper we described an ovarian teratoma that mainly consists of neurogenic tissues.

Keywords: mature cystic teratoma, neurogenic elements, choroid plexus

Background

Mature cystic teratomas (MCT) are one of the most common benign ovarian neoplasms, accounting for 10 to 20 percent of all ovarian tumors.^{1,2} The ovary is conspicuous for the wide diversity of histological cell types that it contains; therefore unusual germ cell components may present diagnostic difficulty on histological examination. Specialized forms of teratoma with unilateral development of certain tissues, such as struma ovarii, neurogenic cysts are known, but the exact pathogenesis of the monodermal development is controversial.^{3,4} A mature cystic teratoma, which was mostly composed of neurogenic elements including glial tissue, melanotic cells, ganglionic cells, peripheral nerve and choroid plexus in a 25-year-old woman is reported in this case report.

Case

A 25 year-old nulliparous woman was presented with hematuria with a history of one week. She was referred to the Urology Department for the etiology of hematuria. Ultrasound examination revealed a cystic left ovary with 5.7x4.5 cm in size. Right ovary was in normal size (3.3x2.2 cm) with a follicular cyst, 12 mm in diameter. Serum human chorionic gonadotropin was negative and CA-125 was 19.50 U/ml (normal value 0–35 U/ml). She underwent a medical treatment for an ovarian cyst with a contraceptive agent for three months. After the medical treatment, no change was observed in the ovarian cyst. On palpation, the left ovary was tender. Therefore cystectomy was performed. During the operation, it was observed that the right ovary, the fallopian tube and the uterus were in normal sizes and locations. There was no ascites. Grossly, the left ovarian tumor was 6 cm in diameter

and had completely smooth and intact surface. The cut surface was unilocular and thin-walled. Microscopically the cavity of the cyst was lined mainly by skin. The skin was composed of keratinized squamous epithelium and contained a few sebaceous and sweat glands. Cyst wall of the tumor was mostly composed of neurogenic elements including glial tissue, cuboidal cells coating the luminal side of the cyst imitating ventricular ependyma, melanotic cells, ganglionic cells, peripheral nerve and choroid plexus located on the different sites of the cyst (Figures 1–3). Endodermal and mesodermal tissues were not present in several sections.

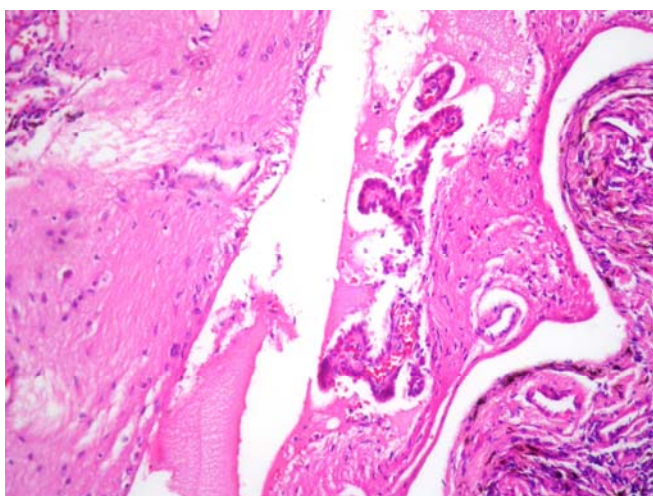


Figure 1. Mature cystic teratoma, composed mainly of fibrillary glial tissue with papillary choroid plexus and aggregates of melanotic cells (H&E, x200, original magnification)

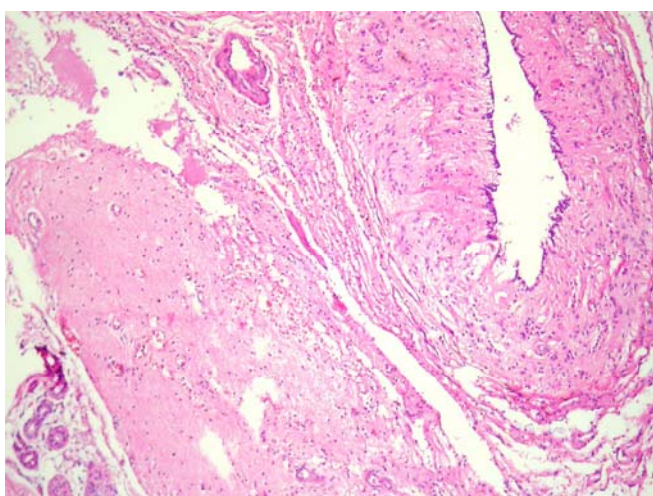


Figure 2. Cuboidal cells coating the luminal side of the cyst imitating ventricular ependyma (H&E, x100, original magnification)

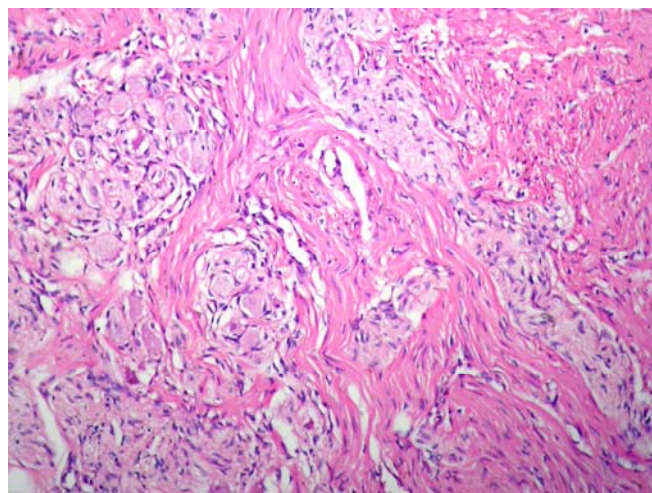


Figure 3. Peripheral nerve and ganglionic cells (H&E, x 200, original magnification)

Discussion

MCT comprises approximately 20 percent of all ovarian neoplasms during the reproductive years.^{1,2} MCTs are derived from primordial germ cells and their usual presentation is in the ovary. They are composed of any combination of well-differentiated ectodermal, mesodermal and endodermal elements with predominantly ectodermal elements. The most common tissues encountered in mature cystic teratoma are skin, sweat glands, teeth, respiratory epithelium, cartilage, salivary glands and nervous tissue.¹ However, this case report presents a MCT of predominantly neurogenic type including glial tissue, ependymal cells, melanotic cells, ganglionic cells and choroid plexus.

Occurrence of different neural tissues in classic benign MCT is well known.⁵ The report of Marcial-Rojas and Medina contained 22–47% peripheral nerves, 25–41% brain tissues, 19–25% ependymal cells and 19–22% ganglionic cells. They found choroid plexus in 6% of the MCT.⁶ Within the neural tissues, a well-known tissue; choroid plexus is rarely defined. Two cases composed of mainly neural tissues, have been described in the literature by Karten and Ulirsch. Karten's case was a cyst composed of neural tissues with Rokitansky's protuberance which showed both epidermal and mesodermal elements.⁷ Ulirsch's case contains lactating mammary tissues, hair and teeth in addition to neural elements.⁸ Although neurogenic tissues were predominant in our case, it cannot be regarded as purely monodermal, due to small areas of

skin and skin appendages in the wall of the cyst. Benign cystic monodermal teratoma of purely neurogenic origin is extremely rare and only one case was reported in the literature.⁵ It is evident from the literature that "neurogenic cysts" are much larger than "dermoid cysts", and reported only in prepubertal girls. Our patient was 25 years old and the tumor was 6 cm in diameter.

Our case is an interesting example of MCT with unusual components that mostly composed of various neural tissues with choroid plexus which is rarely reported in the literature. Rarely a teratoma appears to be derived from only one of the germ cell layers and the reason for this is unknown. New studies should be performed in order to better understanding the histogenesis of germ cell tumors. Also this case warrants the pathologist's attention for neuronal tissues when examining mature cystic teratomas.

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