

# Mature cystic teratoma with neurogenic components and struma ovarii: a rare case report and review of the literature

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Mature cystic teratoma of the ovary is a common germ cell tumor among women. Teratomas are more frequently seen in younger women. In teratoma, all three germ cell layers are present, and hence any type of histological tissue can develop. As regards the type of tissue present, it may be mature or immature. In monodermal teratoma, one of the tissues may predominate, such as thyroid tissue in struma ovarii and neuroectodermal tissue in carcinoid tumor. Here, we present a case report in which a young woman presented with ovarian mass diagnosed histopathologically as mature ovarian teratoma having mostly neurologic elements such as glial tissue, melanotic cells, choroid plexus, and struma ovarii, and along with that fat and respiratory epithelium were also identified. Ovarian teratoma is composed of derivatives of three germ cell layers, but in some cases monodermal component such as struma ovarii can be seen with neurogenic components and mesodermal components.

## Keywords:

histopathology, ovary, teratoma, tumor

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## Introduction

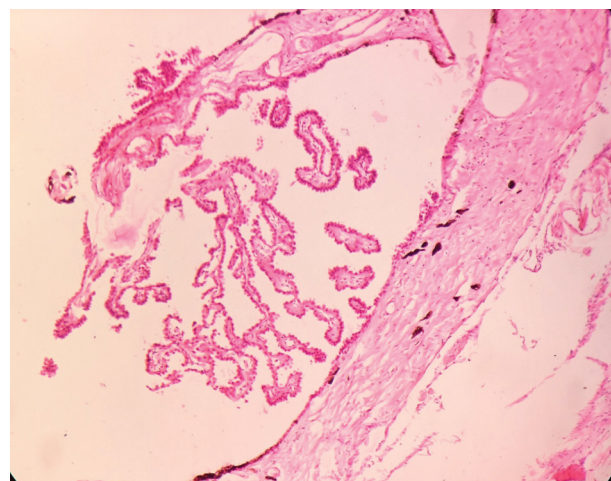
Teratomas are tumors frequently derived from germ cells and commonly arise in gonads. They can also develop along the body midline such as the base of the skull, mediastinum, and the sacrococcygeal region, which is a migratory pathway of the primordial germ cells from the yolk sac [1]. In the testicles, teratomas arise during childhood, but ovarian teratomas can arise throughout the life span, being frequent during the reproductive period [2]. Most of the ovarian teratomas are grossly cystic but can also be solid. Microscopically, it can be composed of tissue derived from all germ layers (i.e. ectoderm, endoderm, and mesoderm). The ectoderm mainly consists of the skin and brain. Specialized form of teratoma with unilateral development of certain tissue, such as struma ovarii and neurogenic cyst, is known, but the exact pathogenesis is controversial [3]. A mature cystic teratoma having struma ovarii and neurologic elements along with other components in a 25-year-old woman is reported in the present case.

## Case report

A 20-year-old woman with complaint of mass in the abdomen and anemia presented. Ultrasound examination revealed cystic ovarian mass. Therefore, cystectomy was performed and sent for routine histopathology examination. On gross examination, the formalin-fixed specimen was 5×5×5 cm<sup>3</sup> in diameter and had smooth and intact surface. Cut surface was unilocular and thin walled and it was filled with putty-like material and hair,

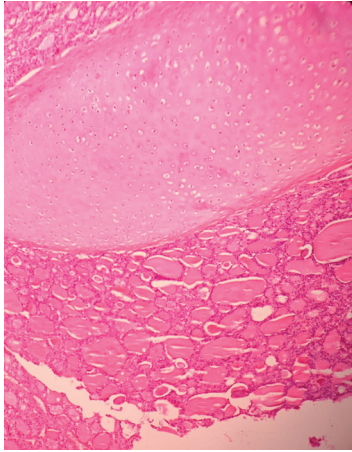
whereas along with that one hard area was seen measuring 0.5×0.5 cm<sup>2</sup>. Sections of 4-μm thickness were prepared and stained with hematoxylin and eosin. Histopathology examination revealed skin lining with sebaceous, sweat glands. Neurological component seen were glial tissue, choroid plexus, and melanotic cells (Fig. 1). The other components seen were struma ovarii, cartilage, respiratory epithelium, and fatty tissue (Fig. 2).

Figure 1



H&E stained section showing choroid plexuses in mature cystic teratoma.

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**Figure 2**

H&amp;E stained section showing cartilage with struma ovarii in teratoma.

## Discussion

Mature cystic teratomas constitute ~20% of all ovarian neoplasms during the reproductive years [3]. The most common clinical symptoms are pressure, pelvic pain, and irregular bleed, but sometimes it may result from complications such as torsion, rupture, peritonitis, and autoimmune hemolytic anemia [4]. Most mature ovarian teratomas are cystic but solid can also be seen, and on cutting hairs, putty-like material, teeth, and human body can be identified [5]. In present case the women presented with complaint of mass in abdomen and anemia, and ovarian mass was grossly cystic predominantly with very small solid area measuring  $0.5 \times 0.5 \text{ cm}^2$ , which on cutting showed putty-like material with hairs. Microscopically, they can be composed of tissue derived from all three germ layers (i.e. ectoderm, mesoderm, and endoderm). The tissue in teratoma is usually well-differentiated (mature), but can be at fetal stage of development (immature). The most common tissues encountered in mature cystic teratoma are skin, sweat gland, teeth, respiratory epithelium, cartilage, salivary gland, and nervous tissue [2]. The occurrence of different neural tissue in benign mature teratoma is well known. The report of Marcial Rojas and Medina [6] contained 22–47% brain tissue, 19–25% ependymal cells, and 19–22% ganglionic cells. They found choroid plexus in 6% of the mature cystic teratomas. Within the neural tissue, choroid plexus is rare [6]. Struma ovarii is the expression of thyroid

tissue in teratoma. It accounts for 10% of cases in mature cystic teratoma [5]. In the present study, struma ovarii, cartilage, respiratory epithelium, skin with adnexa, neural tissue including glial tissue, melanotic cells, and choroid plexus were seen together, which is rarest and not seen in the literature.

## Conclusion

Mature cystic ovarian tumor is a common tumor in the reproductive age group. However, it is very uncommon to find neurological components with specialized tissue such as struma ovarii and other mesodermal components. While examining teratomas such combination should be kept in mind. Newer studies should be carried out to know more about the histogenesis of teratomas.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

## References

- 1 Faure Conter C, Rocourt N, Sudour Bonnage H. Pediatric germ cell tumors. *Bull Cancer* 2013; 100:381–391.
- 2 Tallerman A, Vang R. Germ cell tumors of the ovary. In: Kurman RJ, Ellenson Hedrick L, Ronnett BM, editors. *Blaustein's pathology of the female genital tract*. 6th ed. New York: Springer; 2011. pp. 847–907.
- 3 Ayhan A, Bukulmez O, Gene C, Karamursel BS, Ayhan A. Mature cystic teratomas of the ovary: a case series from one institution over 34 years. *Eur J Obstet Gynecol Reprod Biol* 2000; 88:153–157.
- 4 Medeiros F, Crum CP. Germ cell tumors of the ovary. In: Crum CP, Nucci M, Lee KR, editors. *Diagnostic gynecologic and obstetric pathology*. 2nd ed. Philadelphia: Elsevier Saunders; 2011. pp. 905–37.
- 5 Rosai J. Ovary. In: Rosai J, Ackerman L, editors. *Textbook of surgical pathology*. Vol. 2. 9th ed. New Delhi: Elsevier; 2004. pp. 1886–1890.
- 6 Marcial Rojas RA, Medina R. Cystic teratomas of the ovary; a clinical and pathological analysis of two hundred sixty eight tumors. *AMA Arch Pathol* 1958; 66:577–589.