

A case report on Mature Cystic Teratoma with well differentiated Neuroendocrine Tumor

Case report :

Neuroendocrine neoplasms of the ovary are rare neoplasms constituting 0.1% of all the ovarian neoplasms and less than 5% of all the neuroendocrine neoplasms. We report here such a rare case of carcinoid in mature cystic teratoma managed in Khoula hospital, Muscat, Oman.

A 41year old lady, G7P6, presented at 9+3 weeks of gestation with bleeding and pain abdomen. A diagnosis of complete miscarriage was made. Ultrasound findings were suggestive of dermoid cyst with suspected torsion. She underwent emergency laparoscopic cystectomy. Histopathological examination of the specimen revealed a mature cystic teratoma with an incidental small focus of a well differentiated neuroendocrine tumour. The patient was referred to the Oncology Centre for further evaluation and follow up.

Discussion :

It has been reported that in the United States, the annual incidence of neuroendocrine neoplasms is 6.98/100,000, and the prevalence 170,000. ¹⁻³ Neuroendocrine neoplasms are a heterogenous group of neoplasms arising from the endocrine cells derived from neuroectoderm, neural crest and the endoderm. ⁴⁻⁵ Gastrointestinal and respiratory tracts are the usual locations. ⁶ In the female reproductive system, cervix and ovaries are the most common locations, however few cases have been described in the uterine corpus. Metastases from the gastrointestinal tract, lungs and thymus should be always excluded, especially when ovaries are involved. A thorough histopathological assessment is essential in these neoplasms to distinguish from other primary ovarian neoplasms,especially granulosa cell tumor. ⁷ To standardize nomenclature and to resolve complexity, the World Health Organization (WHO) has proposed a universal definition system for neuroendocrine neoplasia based on differentiation and proliferative grading.

Histopathology :

The specimen received in the lab was comprised of multiple pieces of cyst wall measuring 7.5 x 5.5 cm, with variable wall thickness up to 1.5 cm. There was a single focal bony hard area of 1.5 cm size. The specimen was adequately sampled. Examination of the specimen under the microscope revealed a mature cystic teratoma lined by stratified squamous epithelium with underlying skin adnexa (figure 1). Other components including adipose tissue, cartilage, smooth muscle, respiratory epithelium, seromucinous glands and thyroid tissue were also present. Focally, there was a small area of infiltrative nests and tubules with stippled nuclei and amphophilic cytoplasm (Figure 2). There was no mitosis identified and the cells were diffusely positive for neuroendocrine markers CD56 and synaptophysin (Figure 3) as well as focally positive for Chromogranin A. Ki67 (Cell proliferation marker) was positive in < 1% of the cells. The histological findings along with the small size of 3.2 mm, absence of mitosis, low Ki67 index and the immunostain profile was diagnostic of Mature cystic teratoma with Well differentiated neuroendocrine tumor, Grade 1 (NET, G1).

Figure 1: A teratoma lined by Skin with attached adnexa. Figure 2: Focus of NET.

Thyroid tissue is present.

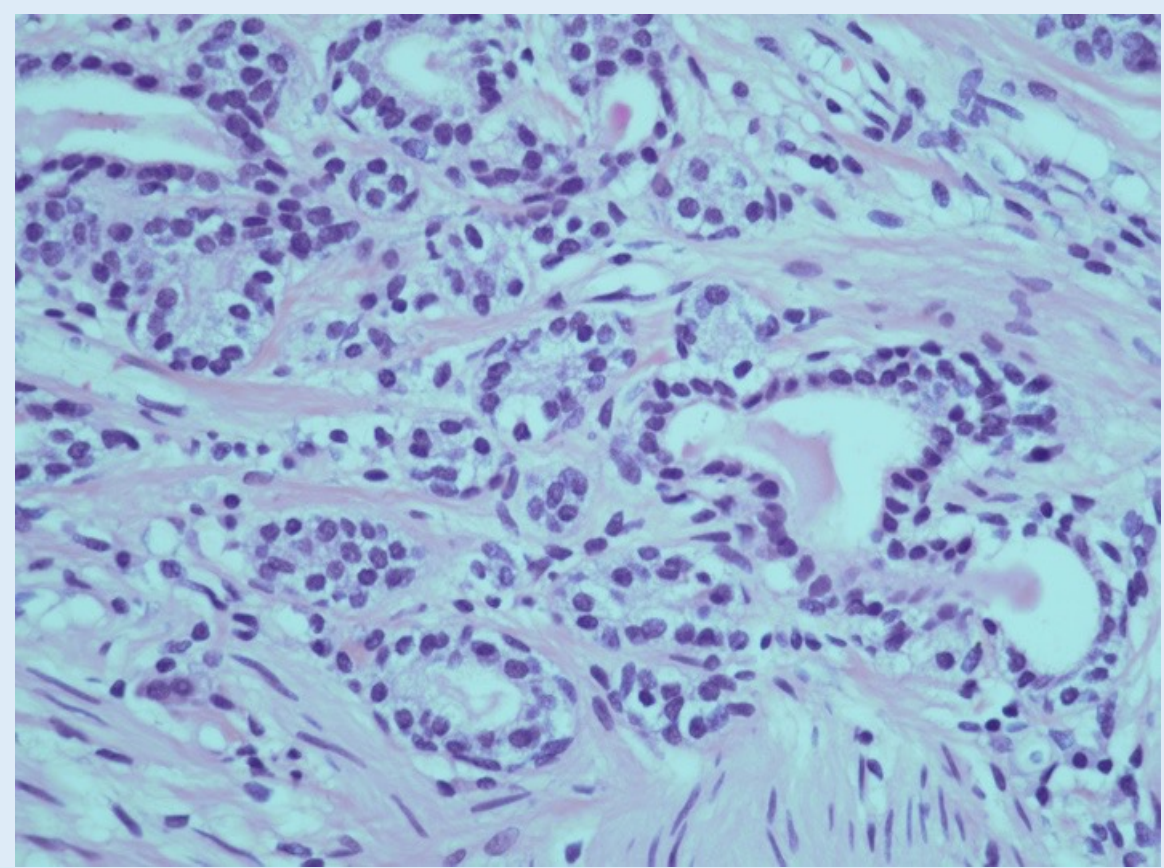
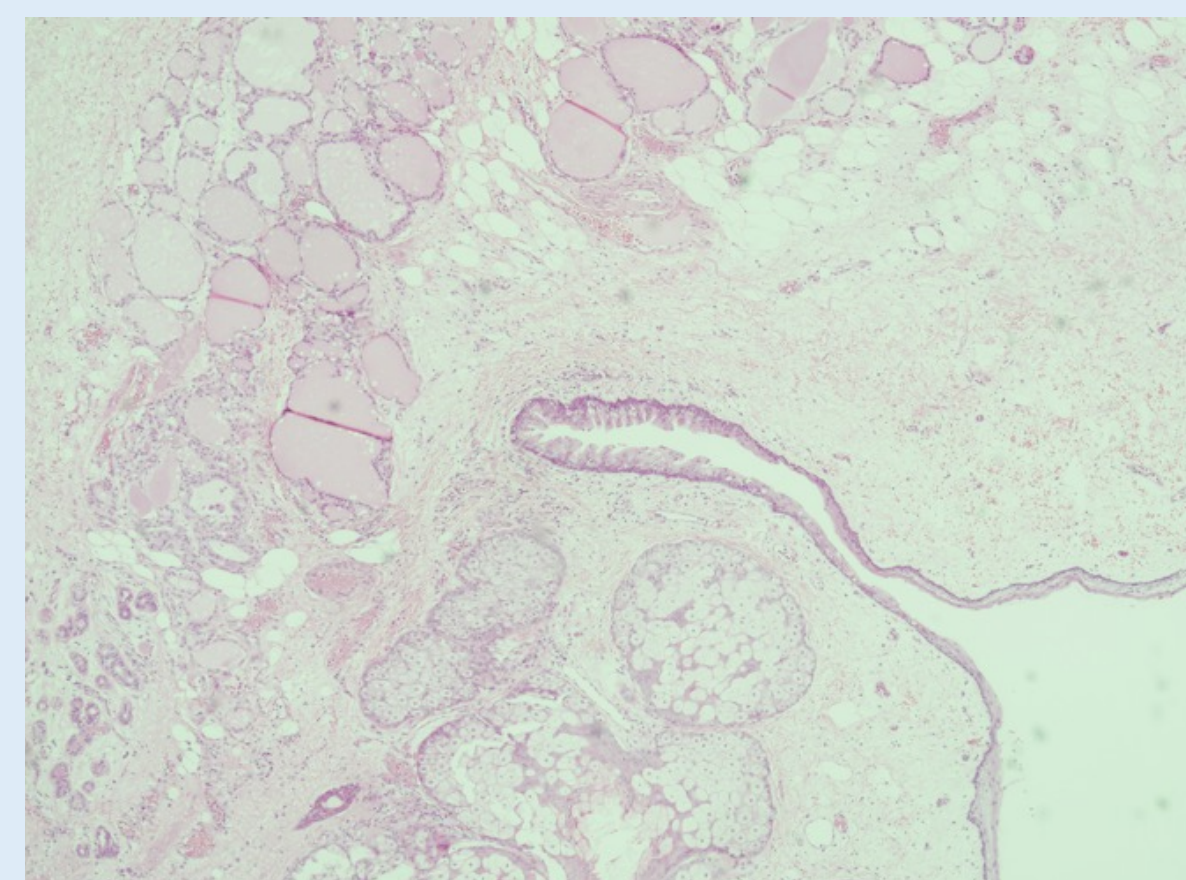
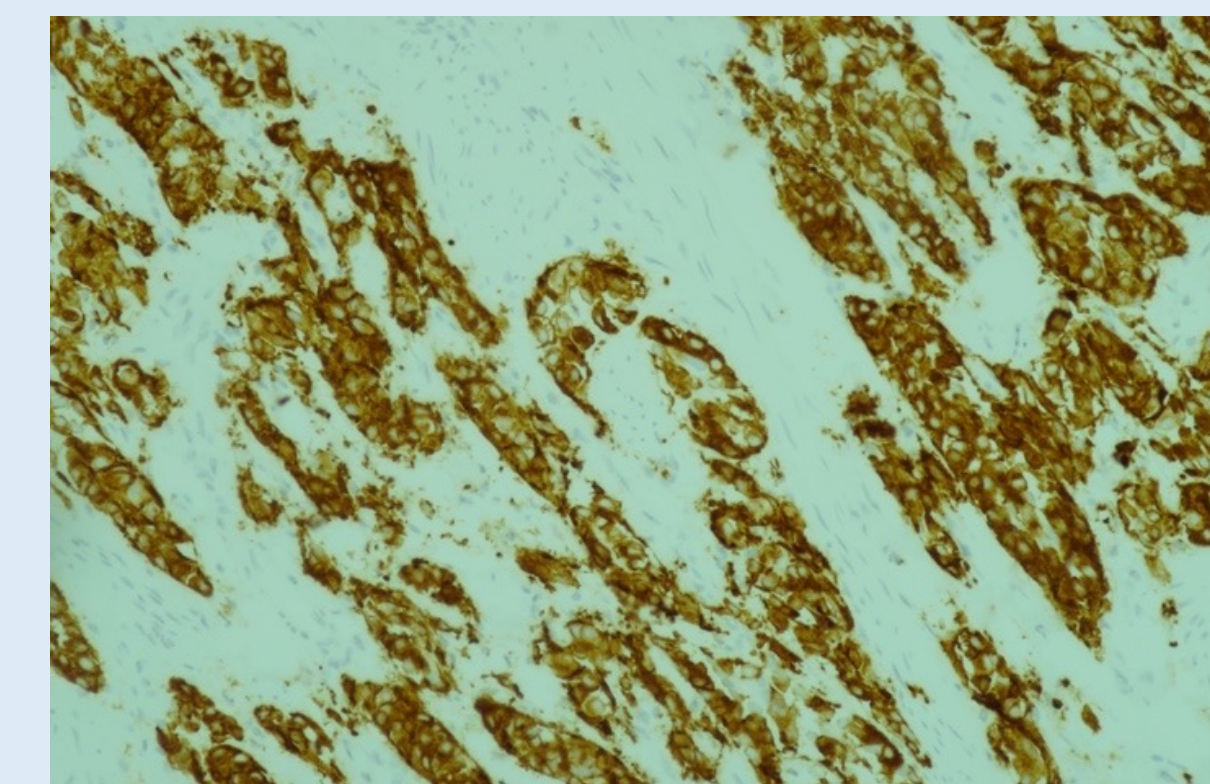


Figure 3: Diffuse positivity for Synaptophysin immunostaining



Dr. Anuja Thomas^{1,2}, Dr. Sudha Krishnan^{1,2}, Dr. A.R. Vijayalakshmi³, Dr. Fathiya Al Madhouri^{4,2}, Dr. Rahma Al Ghabshi^{5,2}, Dr Zahra Al Hajri^{6,2}, Dr Zainab Al Manji^{7,2}

1. Specilaist OBGYN 2. Khoula Hospital, Muscat, Oman 3. Senior Consultant, OBGYN, Muscat Private Hopsital, Oman 4. Senior Specialist OBGYN 5. Consultant and HOD , OBGYN 6. Senior Consultant, Pathology 7. Specialist, Pathology

Management :

Implants outside the ovary, bilateral tumors, vessel infiltrations and the absence of teratoma elements point to the metastatic nature of the tumor. Brenner tumors, granulosa cell tumor or Sertoli-Leydig cells tumors are the important differential diagnosis for ovarian NEN. Surgery is the treatment of choice. Fertility sparing surgery is possible in patients with normal contralateral ovary and Ki-67 index does not exceed 5%. There are no set treatment guidelines for NEN of the female genital tract due to the rarity of the condition. Literature provides case reports and case series only. Most of the patients are treated according to protocols used for epithelial cancers of the genital tract. Neuroendocrine neoplasms of the ovary are often treated with debulking surgery followed by adjuvant chemotherapy with carboplatinum and paclitaxel in line with treatment standards for epithelial ovarian cancer.⁸ A study by Pang et al. which included 11 case reports, mentioned that the prognostic factors for ovarian NENs are age, stage of the disease, mode of treatment, and histological type.⁹

Conclusion:

Neuroendocrine neoplasms of the gynecological tract are a heterogenous group of tumors that necessitate involvement of multidisciplinary mode of management. Due to the rarity of the disease and the absence of consensus on the treatment guidelines, proper histopathological grading, and referral to experienced centers play an important role in the improved outcome.

References :

1. Galgano, S.J.; Sharbidre, K.; Morgan, D.E. Multimodality imaging of neuroendocrine tumors. *Radiol. Clin.* **2020**, *58*, 1147–1159. [\[CrossRef\]](#) [\[PubMed\]](#)
- 2.Dasari, A.; Shen, C.; Halperin, D.; Zhao, B.; Zhou, S.; Xu, Y.; Shih, T.; Yao, J.C. Trends in the incidence, prevalence, and survival outcomes in patients with neuroendocrine tumors in the United States. *JAMA Oncol.* **2017**, *3*, 1335–1342. [\[CrossRef\]](#) [\[PubMed\]](#)
3. Migut, A.E.; Kaur, H.; Avritscher, R. Neuroendocrine tumors: Imaging of treatment and follow-up. *Radiol. Clin.* **2020**, *58*, 1161–1171. [\[CrossRef\]](#) [\[PubMed\]](#)
4. Heller, M.T.; Shah, A.B. Imaging of neuroendocrine tumors. *Radiol. Clin.* **2011**, *49*, 529–548. [\[CrossRef\]](#) [\[PubMed\]](#)
5. Tempfer, C.B.; Tischoff, I.; Dogan, A.; Hilal, Z.; Schultheis, B.; Kern, P.; Rezniczek, G.A. Neuroendocrine carcinoma of the cervix: A systematic review of the literature. *BMC Cancer* **2018**, *18*, 530. [\[CrossRef\]](#)
6. Zhang and Chen *BMC Women’s Health* (2022) 22:76 <https://doi.org/10.1186/s12905-022-01660-x>
7. *Ginekologia Polska* 2021, vol. 92, no. 4, 312–317`
8. *Neuroendocrine Neoplasms of the Ovary: A Retrospective Study of the North Eastern German Society of Gynecologic Oncology (NOGGO)* JALID SEHOULI, HANNAH WOOPEN, MARIANNE PAVEL, ROLF RICHTER, LISA-KATHRIN LAUTERBACH, ELIANE TAUBE, SILVIA DARB-ESFAHANI, CHRISTINA FOTOPOULOU and KLAUS PIETZNER *Anticancer Research* March 2016, 36 (3) 1003-1009;
9. Pang, L.; Guo, Z. Primary neuroendocrine tumors of the ovary: Management and outcomes. *Cancer Med.* 2021, *10*, 8558–8569. [\[Google Scholar\]](#) [\[CrossRef\]](#)