

Malignant Ovarian Tumours in South-East Nigeria

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Abstract

This research aims to describe the clinico-pathologic characteristics of ovarian tumors in Owerri and classify the tumors according to WHO classification of ovarian tumors. The archives of the Department of Pathology, FMC Owerri were the sources of the data used for this study. The period under review was between September 2010 and October 2016. A total of 32 ovarian tumors were received in the department within the period under review. The mean age was 40.65 ± 12.05 years with a range of 6 to 70 years. The commonest ovarian malignancy was the surface epithelial tumors which made up 46.87% (15 cases) followed by the germ cell tumors which constituted 34.37% (11 cases), sex-cord stromal tumors 12.5% (4 cases) and metastatic carcinoma 6.25% (2). The commonest symptom was abdominal mass or swelling which was present in 90.62% (29 cases) followed by abdominal pain 59.37% (19 cases). The mean size was 7.63cm with a range of 2.6 to 23cm.

Keywords: Ovary, Malignancy, Owerri

1. Introduction

Ovarian tumors are a diverse and complex group of neoplasms which occur in women of all ages and are notorious for their large sizes (Sabageh et al. 2012). These diverse pathologic entities are due to the three cell types that make up the normal ovary; the multipotential surface (coelomic) covering epithelium, the totipotential germ cells, and the multipotential sex cord/stromal cells from which the neoplasms could arise (Juan 2004). In Nigeria, studies (Buhari et al. 2005, Nnadi et al. 2009, Okunade et al. 2016) have shown that ovarian malignancies are the second female genital tract cancer in Sokoto, Ilorin, and Lagos. Moreover, ovarian malignancy is the third gynecological cancer in Zaria (Mohammed et al. 2006). In Ghana, a West African country (Wiredu et al. 2006), a ten-year autopsy and hospital mortality data at the Korle Bu Teaching Hospital Ghana demonstrated that ovarian cancer is the fifth commonest cause of death from malignant tumors in women older than 14 years. It accounted for 6% of all cancer deaths and women below the age of 34 years were most affected.

Globally, cancers of the ovary are the seventh most commonly diagnosed cancer among women and the tenth most common in China (Reid et al. 2017). The incidence rates are highest in the Eastern and Central Europe with 11.2 and 6.1 per 100,000 per annum respectively (Chen et al. 2015). Although China has a relatively low incidence rate (4.1 per 100,000), the large population translates to an estimated 52,100 new cases and 22,500 related deaths in 2015 compared to 21,290 new cases and 14,180 related deaths estimated in the USA during the same year (American Cancer Society 2015).

The aim of this study is to describe the clinic-pathologic characteristics of ovarian tumors in Owerri and classify the tumors according to WHO classification of ovarian tumors.

2. Methodology

The archives of the Department of Pathology, FMC Owerri were the sources of the data used for this study. The period under review was between September 2010 and October 2016 (Five years). The accessioning register, histology request and report forms were studied and demographic information, clinical findings and histologic diagnosis were retrieved. The data were analyzed using SPSS version 20.0 and presented in simple tables.

3. Results

A total of 32 ovarian tumors were received in the Department within the period under review. This constituted 17.5% of all gynecological malignant tumors in the period under review. The mean age was 40.65 ± 12.05 years with a range of 6 to 70 years. The commonest ovarian malignancy was the surface epithelial tumors which made up 46.87% (15 cases) followed by the germ cell tumors which constituted 34.37% (11 cases), sex-cord stromal tumors 12.5% (4 cases) and metastatic carcinoma 6.25% (2 cases). The commonest epithelial tumor was serous cystadenocarcinoma (6 cases), mucinous cystadenocarcinoma (4 cases), malignant Brenner's' tumor (2 cases) and a single case of endometrioid ovarian carcinoma. The germ cell tumors were yolk sac tumor (7cases), cystic teratoma with malignant transformation (3 cases) and one case of a carcinoid tumour.

The primary ovarian tumors metastasized to the cervix and vagina, omentum and peritoneum. Metastatic tumors to the ovary were two- metastatic colonic adenocarcinoma and endometrial carcinoma.

The commonest symptom was abdominal mass or swelling which was present in 90.62% (29 cases)

followed by abdominal pain 59.37% (19 cases). Other symptoms were weight loss 37.5% (12 cases), altered menstrual flow 18.75% (6 cases) and postmenopausal bleeding 9.37% (3 cases). This is illustrated in table 2. The mean duration of symptoms was 20.45 months with a range of 1 to 108 months.

The tumors have marked variation in size. The mean size was 7.63cm with a range of 2.6 to 23cm. This is shown in table 3.

Table 1: shows the WHO Classification of ovarian tumours Observed in this study

s/n	Histologic subgroups	Freq	%
A	Surface Epithelial Tumors	15	46.87
i	Serous Cystadenocarcinoma	6	18.75
ii	Mucinous cystadenocarcinoma	4	12.50
iii	Mixed Mullerian Malignant tumour	2	6.25
iv	Malignant Brenner's tumour	2	6.25
v	Endometrioid adenocarcinoma	1	3.13
B	Germ Cell tumors	11	34.37
i	Yolk sac tumour	7	21.87
ii	Malignant teratoma	3	9.37
iii	Carcinoid tumour	1	3.12
C	Sex Cord Stromal Tumours	4	12.5
i	Granulosa cell tumour	4	12.5
D	Metastatic carcinoma to the ovary	2	6.25
i	Colonic adenocarcinoma	1	3.12
ii	Endometrial carcinoma	1	3.22
Total		32	100.0

Table 2 shows the relative frequency of symptoms associated with malignant ovarian tumors.

s/n	Symptoms/ signs	Frequency	%
1	Abdominal mass or swelling	29	90.62
2	Abdominal pain	19	59.37
3	Weight loss	12	37.50
4	Altered menstrual flow	6	18.15
5	Postmenopausal bleeding	3	9.37

Table 3 shows the metric distribution of Ovarian tumor sizes in centimetres.

s/n	Diameter (cm)	Frequency	%
1	1-5	3	9.4
2	6-10	14	43.75
3	11-15	7	21.87
4	16-20	5	15.62
5	21-25	3	9.37
Total		32	100.0

4. Discussion

Ovarian cancer is reported to be the second major cause of death in women among female genital tract malignancies (Mohammed et al. 2006). A total of 32 malignant ovarian tumors were received in the department within the period under review. The mean age was 40.65±12.05 years with a range of 6 to 70 years. These observations agreed with the findings in Benin City and Lagos (Okunade et al. 2016, Forae et al. 2016) where the mean ages were 45.7±4.3 and 40.1±16.2 years respectively. Moreover, in Lahore India (Wasim et al. 2009) the mean age was 49.07±18.5 years.

In this study, the commonest ovarian malignancy was the surface epithelial tumors which made up 46.87% (15 cases) followed by germ cell tumors 34.37% (11cases). These observations agreed with the reports from Ile-Ife, Sokoto, Ghana, India, and Nepal (Sabageh et al. 2012, Nnadi et al. 2009, Akakpo et al. 2015, Asharaf et al. 2012, Kayastha et al. 2009). However, a study of ovarian tumors among children in Zaria demonstrated that germ cell tumor was the commonest tumor of the ovary in childhood.¹³ Similarly, germ cell tumors were the commonest ovarian tumor in Lagos (Onyiorah et al. 2011). The commonest epithelial tumor was serous cystadenocarcinoma 18.75% (6cases) followed by mucinous cystadenocarcinoma 12.5% (4 cases). These observations were also reported (Buhari et al. 2005, Ashraf et al. 2012) in Ilorin and Lahore respectively. Other surface epithelial malignant ovarian tumors in this study were malignant Brenners' tumor 6.75% (2cases), two cases (6.75%) of the malignant mixed Mullerian tumor (MMMT) and a single case (3.37%) of endometrioid ovarian carcinoma. Other studies demonstrated (Yasmin et al. 2008, Garg et al. 2014) that 28.5% and 4.5% of the malignant ovarian tumor were Brenners' tumor and endometrioid carcinoma in India and Pakistan

respectively. Moreover, two cases of malignant Brenners' tumor in Japan (Yamamoto et al. 1999). In Yugoslavia, (Stojiljkovic et al. 2001) MMT is a rare malignant ovarian tumor which occurs more in the postmenopausal women. Though several histologic features of ovarian tumors group them into the borderline or low malignant potential however, these features may not be predictive of their clinical outcomes (Avril et al. 2012).

The second most common group was the germ cell tumors which made up 34.37% of all the tumors in this study. The yolk sac tumor was the commonest in this group constituting 21.87% (7cases) of all the tumors. This is far higher than 5% reported (Nnadi et al. 2009) in Sokoto. Interestingly, extra-gonadal yolk sac tumor of the penile shaft was reported (Samaila et al. 2011) in Zaria. The second tumor in this group was the cystic teratoma with malignant transformation which constituted 9.37% (3cases). Two of these tumors transformed to large cell keratinizing squamous cell carcinoma and malignant monodermal tumor of the struma ovarii type. Malignant transformation is a rare complication of mature cystic teratoma with squamous cell carcinoma being the most common type. However, malignant transformation of cystic teratoma was reported (Nnadi et al. 2009, Koc et al. 2015, Zakkouri et al. 2011, Patri et al. 2014) in Sokoto, Morocco, Turkey and India. In a very rare case, (Kudva et al. 2015) mature cystic teratoma can also transform to malignant melanoma.

The sex-cord stromal tumors and granulosa cell tumours constituted 12.5% (4 cases) respectively with the former ranking the third commonest tumors in this study. Granulosa cell tumour constituted 28.5%, 25%, 20.9%, 3.15% and 0.98% (Juan 2004, Nnadi et al. 2009, Mohammed et al. 2006, Kayastha et al. 2009, Yasmin et al. 2008) in Sokoto, Zaria, Nepal, Pakistan and India respectively.

The primary ovarian tumors metastasized to the cervix, vagina, omentum, and peritoneum. These observations were in agreement with other reports from South Africa, Taiwan, and Greece (Guidozzi et al. 1993, Tsai et al. 2010, Halkia et al. 2012). Other anatomic sites with ovarian tumor metastasis included the regional lymph nodes, liver, brain, breast, and anterior abdominal wall (Nagano et al. 2014, Koji et al. 2013, Ewezu et al. 2014, Longo et al. 2014).

The metastatic carcinoma to the ovaries constituted 6.25% (2 cases). These were primary adenocarcinoma of the colon and the endometrium which metastasized to the ovary. The ovary is a receptacle for secondary malignant tumors from different organs. These secondary malignancies (Ongom et al. 2013, Corrado et al. 2014, Samaila et al. 2008, Hidaka et al. 2011, Stanojevic et al. 2007, Klein et al. 2010) are usually primary tumors of the colon, thyroid, cervix, breast, stomach, and endometrium.

The commonest symptom was abdominal mass or swelling which was present in 90.62% (29 cases) followed by abdominal pain 59.37% (19 cases). Other symptoms were weight loss 37.5% (12 cases), altered menstrual flow 18.75% (6 cases) and postmenopausal bleeding 9.37% (3 cases). The mean duration of symptoms was 20.45 months with a range of 1 to 108 months. Similar reports were made from Lagos, Pakistan, and India (Okunade et al. 2016, Wasim et al. 2009, Garg et al. 2014). However, the mean duration of symptoms varied in different reports with the least occurring within one month in India (Garg et al. 2014).

We observed a marked variation in the sizes of the tumors. The mean size was 7.63cm with a range of 2.6 to 23cm. A study (Saeed et al. 1991) in Pakistan demonstrated that all the ovarian tumours were greater than 10cm in size. Moreover, the range of sizes of ovarian malignancies was between 2.5cm to 40cm in Shree Birendra Hospital, India (Khatri et al. 2011).

Conclusion

Malignant ovarian tumours are becoming one of the challenges facing gynaecological oncologists in our environment, careful understating of the diversity, presentation and tumour biology would help in the diagnosis and management of this group of tumours.

References

- Sabageh D, OO Olaofe, AO Sabageh. (2012), An analysis of the clinicopathologic characteristics of ovarian tumors in Ile-Ife, Nigeria. *Annals of Tropical Pathology*. 3, 97-104.
- Juan Rosai (2004), "Uterus-Cervix" Source: Rosai & Ackermann's Surgical Pathology, 9th Edition.
- Nnadi DC E.I Nwobodo, K.T Tunau, S.A Malami, et al. (2009), *Histo-pathological features of primary ovarian Tumours managed in a tertiary hospital, Sokoto*. *Sahel Medical Journal*. 12 (4): <http://dx.doi.org/10.4314/smj2.v12i4.55698>
- Buhari MO, Ojo BO, Ijaiya MA, Aboyeji PA. (2005), Ovarian Cancers in Ilorin, Nigeria-a Review of Over 80 Cases. *Nig Quart Hosp Med*. 15: 127-30 <http://dx.dio.org/10.4314/nqjhm.v15i3.12772>
- Okunade KS, Okunola H, Okunowo AA, Anorlu RI. (2016), A five-year review of ovarian cancer at a tertiary institution in Lagos, South-West, Nigeria. *Niger J Gen Pract*. 14:23-7. DOI: 10.4103/1118-4647.187901
- Mohammed A, Ahmed SA, Oluwole OP & Avidime S. (2006), Malignant Tumours of the Female Genital Tract in Zaria, Nigeria: Analysis of 513 Cases. *Ann Afr Med*. 5(2): 93 – 96
- Wiredu EK, Armah BH. (2006), Cancer mortality patterns in Ghana: a 10-year review of autopsies and hospital

- mortality. *BMC Public Health*. 6,159. <https://doi.org/10.1186/1471-2458-6-159>
- Reid BM, Permuth JB, Sellers TA (2017). Epidemiology of ovarian cancer: a review. *Cancer Biol Med* 2017. doi: 10.20892/j.issn.2095-3941.2016.0084
- Chen WQ, Zheng RS, Baade PD, Zhang SW, Zeng HM, Bray F, et al. (2016) Cancer statistics in China, 2015. *CA Cancer J Clin.*; 66:115–32. doi: 10.3322/caac.21338
- American Cancer Society. *Cancer Facts & Figures 2015*. Atlanta: American Cancer Society, 2015.
- Forae GD & Aligbe JU. (2016), Ovarian tumors among Nigerian females: A private practice experience in Benin-City, Nigeria. *Adv Biomed Res.* ; 5: 61. DOI: 10.4103/2277-9175.179183
- Wasim T, Majrroh A, Siddiq S. (2009), Comparison of clinical presentation of Benign and Malignant Ovarian Tumours. *J Pak Med Assoc.* 59(1):18-21 PMID: 19213371
- Akakpo KP, Derkyi-Kwarteng L, Gyas RK, Quayson SE, Anim JT. (2015), Ovarian Tumors in Children and Adolescents. *Afr J Reprod Health.* 19 (4): 102-106
- Ashraf A, A. Shaikh S, Ishfaq A, Akram A, Kamal F, Ahmad N. (2012), The relative frequency and histopathological pattern of ovarian masses. *Biomedica.* 28:98-102 DOI: 10.5455/ijmsph.2013.061020132
- Kayastha S. (2009), Study of ovarian tumors in Nepal Medical College Teaching Hospital. *Nepal Med Coll J.* 11(3): 200-202 PMID: 20334071
- Mohammed A, Malalai SA, Calvin B, Abdullahi K. (2010), A histopathological study of ovarian neoplasm in children in a tertiary hospital in Northern Nigeria. *Afr J Paediatr Surg.* 7:75-7 DOI:10.4103/0189-6725.62848
- Onyiaora I, Anunobi C, Banjo AA, Nwanko K. (2011), Histopathological patterns of ovarian tumors seen in Lagos University Teaching Hospital: a ten-year retrospective study. *Niger Q J Hosp Med.* 21(2),114-8 PMID: 21916045
- Yasmin S, Yasmin A, Asif M. (2008) Clinicohistological Pattern of Ovarian Tumours in Peshawar Region. *J Ayub Med Coll Abbottabad.* 20(4):11-13 PMID: 1999919
- Garg R, Singh S, Rani R, Agrawal M, Rajvanshi R. (2014), A Clinicopathologic Study of Ovarian Tumours in India. *J South Asian Feder Menopause Soc.* 2(1), 9-11
- Yamamoto R, Fujita M, Kuwabara M, Sogame M, Ebina Y, Sakurag N et al. (1999), Malignant Brenner Tumors of the Ovary and Tumor Markers: Case Reports *Jpn J Clin Oncol.* 29(6), 308-313. <https://doi.org/10.1093/jjco/29.6.308>
- Stojiljkovic B, Ivkovic T, Panjkovic M, Mutibaric A, Mihajlovic O, Tesic M et al. (2001), Malignant mixed Mullerian ovarian tumor. *Archive of Oncology.* 9(1), 43-5 UDC: 616.24-006:616-02
- Avril S, Hahn E, Specht K, Hauptmann S, Höss C, Kiechle M et al. (2012), Histopathologic features of ovarian borderline tumors are not predictive of clinical outcome. *Gynaecological Oncology.* 127(3), 516-24 <https://doi.org/10.1016/j.ygyno.2012.08.027>
- Samaila, Modupeola, Maitama HY, Abdullahi K, Mbibu H, Waziri GD. (2011), Yolk sac tumor of the penile shaft: A rare primary extragonadal presentation. *Afr J Paediatr Surg.* 8, 241-3. DOI: 10.4103/0189-6725.86074
- Koc S, Tapisiz OL, Turan T, Ocalan R, Ozfuttu A, Boran N, Kose MF, Tulunay HG. (2015), Malignant transformation of mature cystic teratoma of the ovary: a case series. *J Exp Ther Oncol.* 11(1),11-6 PMID:26259384
- Zakkouri FA, Ouachou S, Boutayeb S, Rimani M, Gamra L, Mrabti H et al. (2011), Squamous cell carcinoma in situ arising in mature cystic teratoma of the ovary: a case report. *Journal of Ovarian Research.* 4, 5 <https://doi.org/10.1186/1757-2215-4-5>
- Patni R. (2014), Squamous cell carcinoma arising in mature cystic teratoma of the ovary. *J Midlife Health.* 5(4), 195-7. doi: 10.4103/0976-7800.145169
- Kudva R, Ayachit GS, Ayachit A.(2015), Malignant Melanoma Arising in an Ovarian Mature Cystic Teratoma - A Rare Entity. *J Clin Diagn Res.* 9(4), 14-16 doi: 10.7860/JCDR/2015/12457.5817
- Guidozzi F, Sonnendecker EW, Wright C. (1993), Ovarian cancer with metastatic deposits in the cervix, vagina, or vulva preceding primary cytoreductive surgery. *Gynecol Oncol.* 49(2), 225-8. DOI:10.1006/gyno.1993.1111
- Tsai H, Chang S, Tsai E, Chai C, Wang J. (2010), Metastatic Omental Tumor Secondary to Occult Ovarian Serous Adenocarcinoma. *Fooyin J Health Sci.* 2(1), 32–35 [https://doi.org/10.1016/S1877-8607\(10\)60011-2](https://doi.org/10.1016/S1877-8607(10)60011-2)
- Halkia E, Spiliotis J, Sugarbaker P. (2012), Diagnosis and management of peritoneal metastases from ovarian cancer. *Gastroenterol Res Pract.* 541842. DOI:10.1155/2012/541842
- Nagano H, Muraoka M, Takagi K. (2014), Recurrent ovarian cancer with multiple lymph node metastases successfully treated with lymphadenectomy as secondary cytoreductive surgery: A case report. *International journal of surgery case reports.* 5, 412-415 doi: 10.1016/j.ijscr.2014.04.017
- Kumagai K, Okamura T, Toyoda M, Senzaki H, Watanabe C, Ohmichi M.(2013), Rectal lymph node metastasis in recurrent ovarian carcinoma: essential role of ¹⁸F-FDG PET/CT in treatment planning. *World J Surg*

- Oncol. 11, 184 doi: 10.1186/1477-7819-11-184
- Ewezu NO, Uji AB, Ogbudu S, Nwagboso C, Echei C, Umoh EA et al.(2014), Huge metastatic multicystic ovarian cancer with liver involvement: A Case Report. *Journal of Cancer Treatment and Research*. 2(3), 21-26
- Longo R, Platini C, Eid N, Elias-Matta C, Buda T, Nguyen D, Quélin P. (2014), A late, solitary brain metastasis of epithelial ovarian carcinoma. *BMC Cancer*. 14,543 doi: 10.1186/1471-2407-14-543
- Klein RL, Brown AR, Gomez-Castro CM, Chambers SK, Cragun JM, Grasso-LeBeau L et al. (2010), Ovarian Cancer Metastatic to the Breast Presenting as Inflammatory Breast Cancer: A Case Report and Literature Review. *J Cancer*. 1, 27-31 doi:10.7150/jca.1.27
- Zikic D, Mandic A, Popovi M, Koprivsek K, Panjkovi M. (2005), Metastatic spread of mucinous cystadenocarcinoma of the ovaries into the abdominal wall. *Arch Oncol*. 13(2), 86-8 DOI: 10.2298/AOO0502086Z
- Ongom PA, Odida M, Lukande R, Jombwe J, Elobu E. (2013), Metastatic colorectal carcinoma mimicking primary ovarian carcinoma presenting as ‘giant’ ovarian tumors in an individual with probable Lynch syndrome: a case report. *Journal of Medical Case Reports*. 7, 158 doi: 10.1186/1752-1947-7-158
- Corrado G, Pomati G, Russo A, Visca P, Vincenzoni C, Patrizi L. (2014), Ovarian metastasis from thyroid carcinoma: a case report and literature review. *Diagnostic Pathology*. 9, 193 doi: 10.1186/s13000-014-0193-9
- Samaila MOA, Adesiyun AG, Oluwole OP. (2008), Metastatic ovarian squamous cell carcinoma. *Singapore Med J*. 49(5), e139-41 PubMed *PMID*: 18465040
- Hidaka T, Nakashima A, Hasegawa T, Nomoto K, Ishizawa S, Tsuneyama K et al. (2011), Ovarian Squamous Cell Carcinoma Which Metastasized 8 Years After Cervical Conization for Early Microinvasive Cervical Cancer: A Case Report. *Jpn J Clin Oncol*. 41(6), 807–810 <https://doi.org/10.1093/jjco/hyr041>
- Stanojevic Z, Djordjevic B, Dunjic O. (2007), Metastatic tumors of the ovary: the rate of incidence and the most frequent sites of primary tumors. *Acta Medica Medianae* 46(4), 5-9
- Saeed M, Khawaja K, Rizwana I, Rizv J, Malik I, Khan A. (1991), Clinicopathological analysis of ovarian tumors. *JPMA*. 41, 161
- Khatri R. (2011), Clinic pathological Analysis of Ovarian Tumours at Birendra Military Hospital. *Medical Journal of Shree Birendra Hospital*. 10(1),26-31. <http://dx.doi.org/10.3126/mjsbh.v10i1.6446>

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