ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Borderline Ovarian Tumor With Stromal Microinvasion: A Series of 5 Cases With Rare Clinicopathological Presentation.

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ABSTRACT

A borderline ovarian tumor (BOT) comprises of an independent group of ovarian neoplasms with atypical epithelial proliferation. Mucinous borderline ovarian tumor is defined as an architecturally complex non-invasive mucinous neoplasm with gastrointestinal type differentiation. In our study, we have included 5 cases of Mucinous borderline ovarian tumor with microinvasion and rare clinicopathological presentations. Very few cases progress to carcinoma where the tumor is not sampled adequately. The recurrence rate is 5% and tumor related death is less than 5%.

Keywords: Mucinous borderline ovarian tumor, Stromal Microinvasion, Histopathology.

https://doi.org/10.33887/rjpbcs/2024.15.2.9

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ISSN: 0975-8585

INTRODUCTION

Ovarian cancer is ranked eighth in terms of both cancer incidence and mortality among women worldwide estimated by GLOBOCON 2020 [1]. A borderline ovarian tumor (BOT) comprises of an independent group of ovarian neoplasms with atypical epithelial proliferation. This category encompasses a spectrum of tumors ranging from tumors with a mild degree of proliferation and atypia equivalent to that seen in simple hyperplasia to tumors showing marked proliferation and/ or severe cytologic atypia equivalent to in situ carcinoma but lacking invasion or confluent growth [2]. The incidence of mucinous borderline ovarian tumor (MBOT) is high among the Asian population [3]. Mucinous BOT (mBOT) was redefined in the edition of the World Health Organization (WHO) 2020[1]. It is defined as an architecturally complex non-invasive mucinous neoplasm with gastrointestinal type differentiation. They are differentiated from mucinous carcinomas by the absence of stromal invasion. It is difficult to diagnose these cases histologically as stromal invasion is not easy to demonstrate and criteria for invasion are not unanimously accepted [1].

The interest in these tumors is justified by their relative frequency, their age of onset which is usually ten years earlier than that of invasive ovarian tumors and their prognosis which is better than that of cancers of the ovary with a survival of 95% at five years, all stages combined [4].

MATERIALS AND METHODS

The specimen of all the cases included in this case series were either of hysterectomy with bilateral salpingo-oophorectomy or only oophorectomy specimens. After receiving in our department, the specimens were subjected to thorough grossing according to CAP protocol followed by routine tissue processing method. Hematoxylin and eosin-stained slides were prepared and examined under the microscope.

Case 1

A 47-year-old female presented with right sided abdominal pain. Ultrasound of the abdomen and pelvis showed a large cyst with thick septa and increased vascularity in the adnexa measuring 8 x 5 cm^2.MRI showed a complex ovarian space occupying lesion (SOL)in the right side measuring 8.5 x6x4 cm^3.The patient then underwent total hysterectomy with bilateral salpingo-oophorectomy followed by omentectomy. The specimen was received in our department for histopathological study. Gross examination of the right ovary showed a cyst measuring 7.5x5x4 cm ^{3}(Figure:1a) . The cyst was multiloculated and filled with seromucinous fluid. Omental tissue measuring 4x2x2 cm^3(Figure:1b). Grossly other structures were unremarkable. Microscopic examination revealed Mucinous borderline tumor with microinvasion (Figure :1c) predominantly endocervical type (p $T_{3C}N_X M_X$). It was a Grade I tumor and tumor deposits (Figure:1d) were found in the omentum. Bilateral parametrium were free from tumor and regional lymph nodes were not submitted.

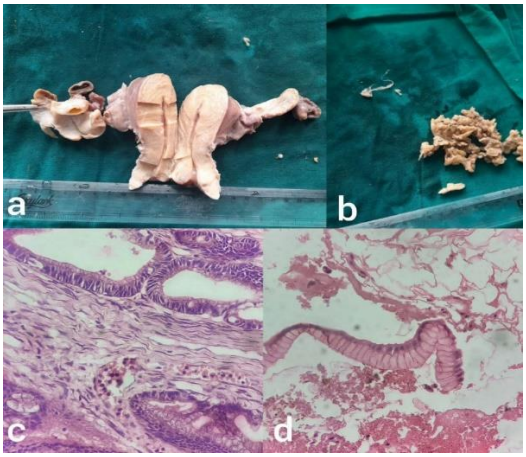

Figure1: Shows gross specimen of hysterectomy and omentectomy (a,b).1c shows microscopic features of mucinous borderline tumor with endocervical type of differentiation and microinvasion with omental deposits(d).

ISSN: 0975-8585

Case 2

A 36-year-old female presented with pain and swelling of the abdomen. Contrast enhanced CT scan was done which showed peripherally enhancing thin-walled multiple septate cystic lesions arising from bilateral adnexal region measuring about 12 cm in maximum dimension. Hydronephrosis was also noted. The patient underwent a left sided oophorectomy. The specimen was received in our department for histopathological study. Gross examination showed a multiloculated cystic structure measuring 10 x8x4 cm^3 filled with mucinous material (Figure: 2a). The capsule was intact. Microscopic examination revealed a mucinous borderline tumor with stromal microinvasion involving the left ovary(Figure:2b).Focal areas show sarcomatoid nodule(one form of stromal microinvasion)(Figure:2c)

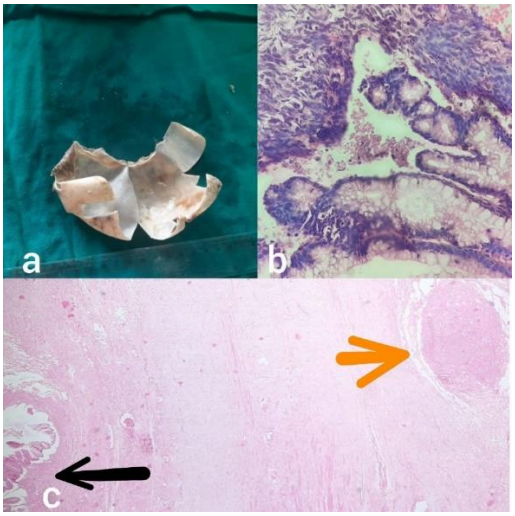

Figure 2: 2a shows gross specimen oophorectomy.2b shows mucinous borderline tumor microinvasion.2c shows sarcomatous nodule (orange arrow) and foci of mucinous borderline tumor (black arrow)

Case 3

A 36-year-old female presented with swelling in the abdomen for 2 months and hypomenorrhea for 1 year. Ultrasound examination of the abdomen showed a large cystic lesion with septations in the right adnexa measuring 12x8.8x8 cm^3.The patient then underwent total hysterectomy with bilateral salpingo-oophorectomy. The specimen was received in our department for histopathological study. The gross examination showed a cystic structure which was multiloculated filled with mucinous material measuring 12x7x3 cm^3(Figure: 3a). There was no breach in the capsule noted. Other structures were grossly unremarkable. Microscopic examination revealed a mucinous borderline tumor with stromal microinvasion involving the right ovary (Figure 3b).

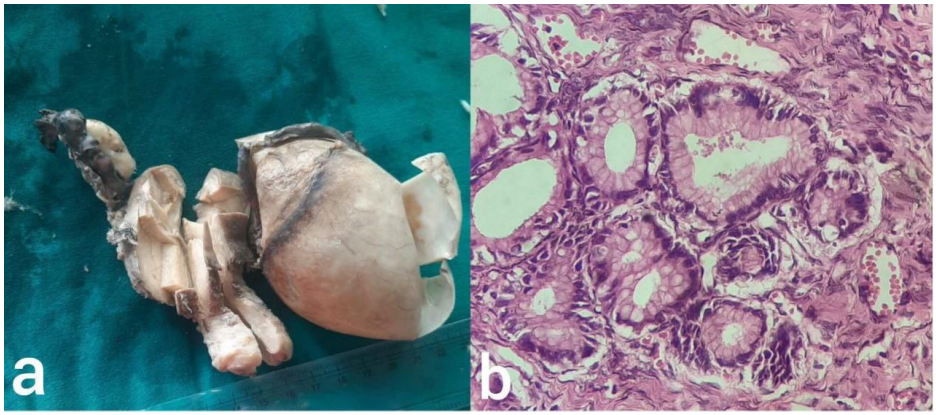

Figure 3: 3a shows gross specimen of total hysterectomy with bilateral salpingo-oophorectomy.3b shows microscopic features of mucinous borderline tumor microinvasion.

ISSN: 0975-8585

Case 4

A 22-year-old female presented with pain in the abdomen for 3 months. Ultrasound examination of the abdomen showed a large cystic lesion with septations in the left adnexal region measuring 12x8x5 cm^3. The patient underwent a left sided oophorectomy. The specimen was received in our department for histopathological study. Gross examination showed a multiloculated cystic structure measuring 11x10x5 cm^3 filled with mucinous material (Figure: 4a). The capsule was intact. Microscopic examination revealed a mucinous borderline tumor with stromal microinvasion involving the left ovary. (Figure:4b)

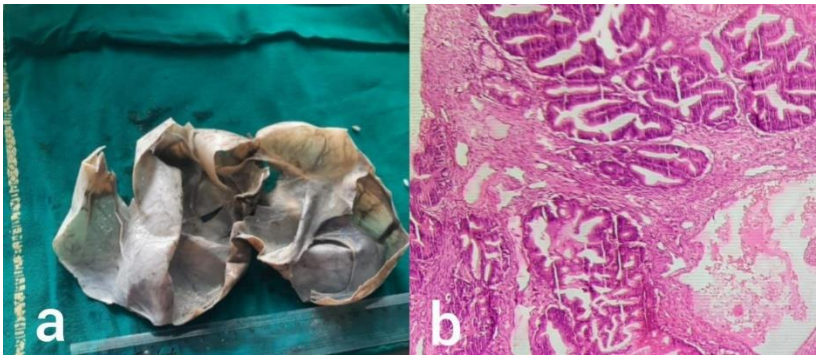

Figure 4: 4a shows gross specimen oophorectomy.4b shows microscopic features of mucinous borderline tumor microinvasion.

Case 5

A 60-year-old female presented with abdominal pain. Ultrasound of the abdomen showed a space occupying lesion in the adnexa measuring 8x4x3 cm3.The patient then underwent total hysterectomy with bilateral oophorectomy followed by omentectomy and appendicectomy. The specimen was received in our department for histopathological study. Gross examination of the left ovary showed a solid area measuring8x4x4 cm^3. (Figure: 5a) Few cystic areas were noted which was filled with mucinous fluid. Grossly other structures were unremarkable. Microscopic examination revealed Mucinous borderline tumor with microinvasion of left ovary (stage: p T_{1a} N_x M_x) (Figure:5b). Omentum was free from tumor deposits.

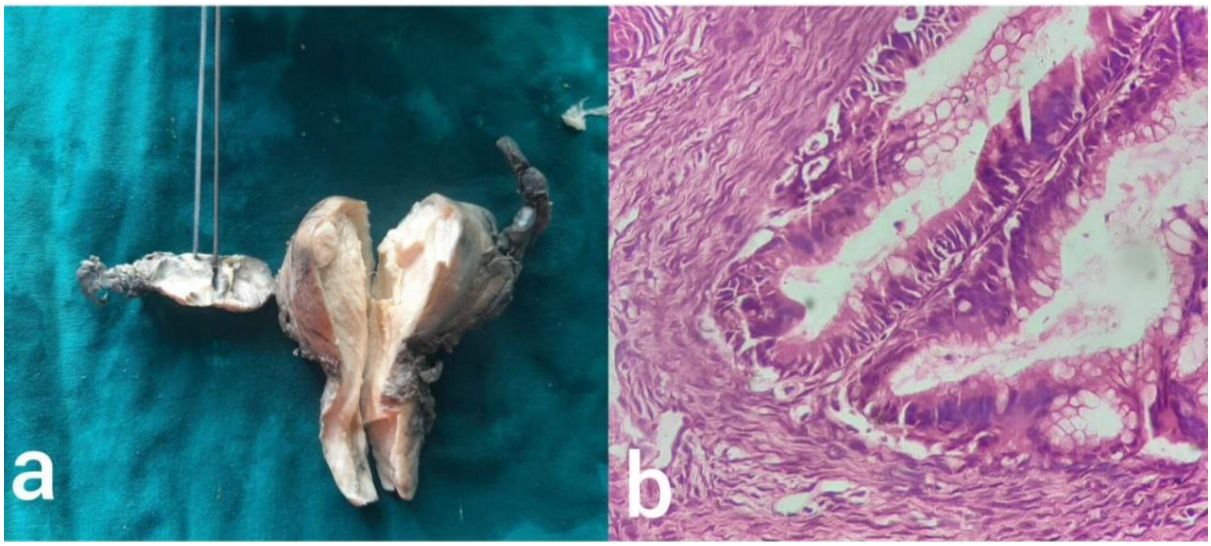

Figure 5:5a shows gross specimen of total hysterectomy with bilateral salpingo-oophorectomy.5b shows microscopic features of mucinous borderline tumor microinvasion

DISCUSSION

BOTs constitute 10–20% of ovarian malignancies, and 30–50% of BOTs are mucinous [5]. Two types of borderline tumors are identified, an intestinal type and an endocervical type. Among these two, intestinal type is more common comprising of more than 90%. Patients with Intestinal type have a better prognosis compared to endocervical type. The risk of metastasis is low and even if the tumors that tend to metastasize tend to be borderline mucinous tumor with intraepithelial carcinoma. However, according to a new classification, endocervical mBOT is a part of seromucinous tumors and intestinal mBOT is accepted as mBOt [6]. It is usually unilateral [7]. Grossly, cysts are multiloculated filled with mucinous contents and smooth external capsule. Sometimes, solid areas and necrosis may be present. Microscopically, mBOT comprises of Complex architecture with tufting and villus formation. Epithelium shows low grade dysplasia of the intestine with goblet cells, neuroendocrine cells and at times Paneth cells. Neoplastic cells show hyperchromasia, crowding, stratification and mitotic activity. Microinvasion may be associated which is a Foci of stromal invasion, measuring < 5 mm in the greatest dimension [8]. It may also be associated with intraepithelial carcinoma which is a foci with high grade cytologic atypia. *KRAS* mutations are identified in 30 - 75% of the tumors [9] and *TP53* mutations are present in lower frequency. The treatment of choice of mBOT is surgical. Patients either undergo a radical surgery or a conservative surgery in case of young women to preserve the fertility [4]. The prognosis of these tumors is excellent because they are at stage I at diagnosis [10]. Mucinous borderline tumor with intraepithelial carcinoma: 95 - 100% overall survival rate [11]. Tumors with microinvasion are associated with recurrence rate of 5%. The patients who were included in this study were followed up and they are doing well.

In our case series, there are rare clinicopathological presentations of mBOT, which are listed as follows:

Case 1: Most of the mBOTs mentioned in the literature are intestinal type, but in our case study, we have got endocervical type of differentiation. Also, in this case omental deposits show endocervical type of differentiation which is usually seen in seromucinous ovarian tumors rather than mucinous tumors.

Case 2: Stromal microinvasion was found in the form of sarcoma like mural nodule. This sarcoma like mural nodule is a rare entity and most of the patients run a benign course.

Case 3 and 4: The ovarian SOL was a very thin-walled cystic structure with a provisional diagnosis of serous and mucinous cystadenoma. But on microscopic examination both showed MBOT along with stromal invasion.

Case 5: The tumor grossly was predominantly solid. Mucinous tumors of the ovary is usually cystic . In our case it was reported as MBOT with stromal microinvasion with no evidence of mucinous carcinoma.

CONCLUSION

In our case series we showed MBOT with stromal microinvasion may have a wide spectrum of gross and microscopic appearance. The prognosis of these cases are excellent .Very few cases progress to carcinoma where the tumor was not sampled adequately. The recurrence rate is 5% and tumor related death is less than 5%.

ACKNOWLEDGEMENT

We would like to thank the department of surgery of our institution.

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