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Case Series

Gynaecological quandary - mucinous tumours of ovary

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ABSTRACT

Mucinous ovarian cancer is a type of epithelial ovarian tumor. It might be considered a subtype of epithelial ovarian tumors but they present and behave significantly different from them. Appreciating these differences and specific evaluation can improve the management and prognosis in such cases. To highlight these difficulties and dilemmas, we present our experience of managing 5 such cases of mucinous tumours with varied presentation and the treatment protocols followed to get successful outcome in each case. First patient was a young patient with unilateral ovarian mass (8 cm size) with normal tumour markers who underwent laparoscopic cystectomy (in bag removal) for benign mucinous cystadenoma. Second patient who was a nulligravida with huge ovarian mass with normal tumour markers, fertility preservation surgery in the form of unilateral salpingo-oophrectomy with limited surgical staging was done in the background of borderline mucinous ovarian tumor. Third patient was perimenopausal lady having bilateral ovarian masses which turned out to be Borderline mucinous ovarian tumour on frozen and underwent complete surgical staging. Fourth patient was nulligravida who presented with a large size ovarian mass (20 cm) underwent staging laparotomy in view of mucinous carcinoma of ovary on frozen section. Fifth patient was an unusual presentation where a diagnosed case of carcinoma endometrium had simultaneous presence of bilateral ovarian masses giving impression of advanced Ca endometrium but to our utter surprise turned out to be a case of synchronous tumours (Ca endometrium + borderline mucinous tumours in both ovaries) on histopathology and immunohistochemistry (IHC) making it a case of synchronous tumours. The varied presentation of mucinous ovarian tumors needs to be understood in detail so that targeted treatments can be given for successful outcome.

Keywords: Mucinous ovarian cancer, Unilateral salpingo-oophrectomy, Ovarian tumors

INTRODUCTION

Ovarian tumors represent a wide range of pathology from being benign masses to tumors of borderline nature to invasive cancers. Ovarian malignancy is the sixth most common cancer and the seventh most common cause of cancer deaths in women globally.[1] The surface epithelial tumours of ovary constitute about 90% of ovarian cancers.

Mucinous ovarian carcinomas account for 3–5% of all cases of epithelial ovarian cancers.[2] Recent studies have shown that these have specific clinical presentation and biological behavioral pattern when compared with all other epithelial ovarian cancers.[3] It is characterized by a large, multi-locular neoplasm with mucus in it. It is commonly seen that benign cystadenomas, low malignant potential (LMP) tumors, and invasive mucinous carcinomas coexist in close proximity within a tissue. This suggests a continuum from benign to borderline to invasive disease in the spectrum of mucinous ovarian tumors. The management of mucinous tumours is mostly based on similar guidelines as developed for serous ovarian cancers. The primary modality is surgery (staging laparotomy) followed by adjuvant therapy if required

based on histopathology and final staging. Here we present the varied clinical presentation of mucinous tumours in different subsets (age group) of patients and the treatment challenges which were encountered in managing these patients and successful outcome in all cases.

CASE SERIES

Case 1

A 26-year-old multiparous lady presented with intermittent pain abdomen for last 2 years, there was no history of gastrointestinal (GI) symptoms, weight loss, loss of appetite, no history of fever and cough and no comorbidities were present. She did not offer any menstrual complaints. General physical examination was within normal limits. Per abdominal examination revealed a soft non-tender abdomen with no distension/ organomegaly/mass felt on palpation. Per speculum revealed healthy cervix and vagina. On PV examination uterus was normal size, right adnexa were free and non-tender and left adnexa showed 8 cm cystic palpable mass which was mobile and tender on bimanual examination. Ultrasound confirmed the finding of left ovarian mass (8×5.8 cm) abutting the uterus, hypoechoic with flaky contents within with likely diagnosis of mucinous cystadenoma. Patient was further evaluated with tumour markers which showed Ca 125-32 IU/ml, CEA-2 IU/ml, CA 19.9-0.8 IU/ml, HE4-29.9 pmol/l, AFP-2 ng/ml, B-HcG-2 mIU/ml, and lactate dehydrogenase (LDH)-150 U/ml, all within normal limits.

In view of unilateral cystic ovarian mass with no solid component and normal tumour markers we decided laparoscopic approach for removal of the ovarian mass. Patient underwent laparoscopic left ovarian cystectomy (in bag). Intra-operatively, left ovarian cyst of 8×5 cm was noted, cyst punctured inside endobag, uterus B/L tubes and other ovary healthy, no free fluid seen in abdomen. Upper abdomen was NAD, frozen section of cyst wall revealed benign mucinous cystadenoma which was confirmed on final histopathology. Post-operative recovery was uneventful and patient was discharged on D3.

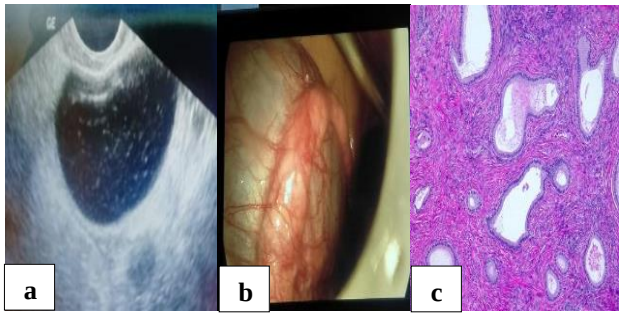

Figure 1: Patient 1-left ovarian mucinous cystadenoma (a) preoperative USG (cystic mass flaky contents), (b) intra-op – left ovarian mass, and (c) final HPR-mucinous cystadenoma.

The idea behind presenting this case scenario was to highlight the importance of laparoscopic surgery in ovarian tumours with either benign or early-stage malignancy and to highlight the concept of in bag removal of tumour in such cases to avoid any spillage into the abdominal cavity further upgrading the stage.

Case 2

A 28-year-old nulligravida presented with abdominal distention and dyspareunia for last 9 months. There was no history of GI symptoms, weight loss, loss of appetite, no history of fever and cough and no comorbidities were present. She did not offer any menstrual complaints. General physical examination was within normal limits. Per abdominal examination revealed large mobile cystic mass of 30×30 cm occupying whole of abdomen with no free fluid and mass was non-tender. Getting below the swelling was not possible in this case.

On per speculum, cervix was congested otherwise normal, vagina healthy. PV examination showed normal size uterus, anteverted with large soft cystic mass felt in both the fornices. Ultrasonography (USG) revealed cystic mass 33 cm in pelvis with multi loculations. Higher imaging in the form of contrast-enhanced magnetic resonance imaging (CE-MRI) revealed 34×22×11 cm multi-loculated abdomino-pelvic thin-walled mass. No papillary projections or solid areas seen with in the mass. Further evaluation with tumour markers showed Ca 125-37.5 IU/ml, Ca 19.9 <3 U/ml, CEA <0.05 ng/ml, HE4-54.29 pmol/l, AFP-5.2 ng/ml, beta hCG-0.83 mIU/ml, LDH-279 IU/l, and inhibin- 78.37 mg/ml.

In view of young age with near normal tumour markers and nulligravida status patient was offered fertility preservation surgery. Intra-op it was a large cystic mass arising from right ovary, uterus, bilateral tubes and left ovary were healthy, minimal free fluid in pelvis with no obvious disease in omentum, no tumor on surface and no capsular rupture, no disease in upper abdomen and no obviously enlarged nodes were seen.

Patient underwent fertility preservation surgery in the form of right salphingo-oophorectomy with peritoneal fluid cytology, multiple peritoneal biopsies and infracolic omentectomy. Appendix was grossly normal, hence not removed. Intra-op frozen showed borderline mucinous ovarian tumour which was confirmed on final histopathology. Final HPR was stage 1A borderline mucinous tumour. Patient is on regular follow up for last 3 years, has conceived spontaneously after 1 year of surgery and delivered a female baby 1 year back and will be considered for completion surgery in near future.

This case highlights the importance of fertility preservation surgery in young patients where future fertility is at stake and once the patient has completed her family she can be offered completion surgery.

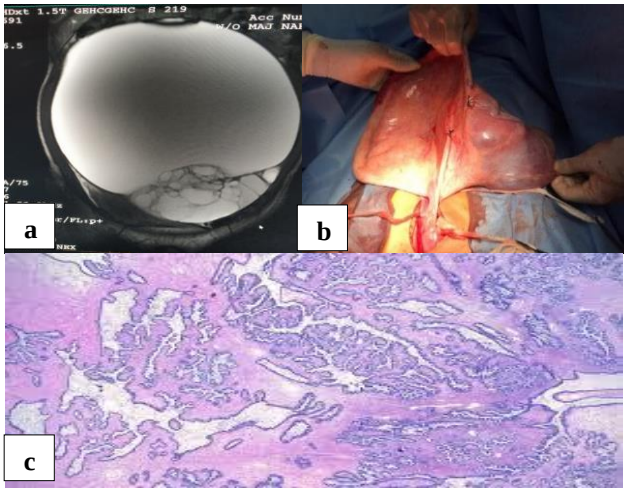

Figure 2: Patient 2 – borderline ovarian tumour (a) CE MRI- large cystic ovarian mass, (b) intraoperative image- large right ovarian mass with normal left adnexa, and (c) HPE-borderline ovarian tumour right side.

Case 3

A 40-year-old multigravida presented with complaints of abdominal distension and pain abdomen for 1 year with no history of GI symptoms, weight loss, no history of fever and cough and no comorbidities. She complains of loss of appetite for 3 months. She did not offer any menstrual complaints. General physical examination was essentially normal. Per abdominal examination revealed distended abdomen with cystic abdominopelvic mass 26 weeks size gravid uterus having smooth, regular surface with no free fluid. Per speculum did not reveal any abnormality. PV examination revealed normal size anteverted uterus with no abnormality in right adnexa. Left adnexa, revealed cystic mobile, tender mass of approximately 20 cm size occupying whole of left fornix.

USG showed a complex multi-locular multi-cystic mass 15×18 cm with minimal free fluid in abdomen. Tumour markers done showed CA125-20.89 IU/ml, CA19.9-93.9 IU/ml, CEA-0.93 ng/ml, HE4- 28.2 pmol/l, B-HcG-0.5 mIU/ml, AFP-1 ng/ml, and LDH-121 U/ml.

Higher imaging in the form of contrast enhanced MRI showed large complex multi-loculated, multi-septate, cystic abdomino-pelvic mass (17.4×19.6×10.8 cm) with multiple papillary projections within, with probable diagnosis of epithelial neoplastic ovarian lesion likely mucinous tumour. UGIE and LGIE was done in view of raised Ca 19.9, which were essentially normal.

Patient was posted for staging laparotomy with intra-op frozen section, as the patient was premenopausal with completed family.

Intra-operatively, hemorrhagic ascitic fluid 100 ml seen, left ovarian mass (25×30 cm) and right ovarian mass (5×5 cm) noted with no tumour on surface and no capsular rupture. Intra–operatively frozen section of both masses revealed bilateral surface epithelial neoplasm with nuclear atypia suggestive of bilateral borderline ovarian tumour. Uterus was 6 weeks size. Patient underwent staging laparotomy - peritoneal cytology + TAH + BSO + multiple peritoneal biopsies + infracolic omentectomy. Upper abdomen was normal and appendix was healthy in outline hence not removed. Post-operative period was uneventful and patient was discharged on D5. Final histopathology confirmed it to be bilateral borderline mucinous ovarian tumour (stage 1b) and patient received 6 cycles of chemotherapy as adjuvant treatment. Presently patient is on regular follow-up and is disease free for last 2 years.

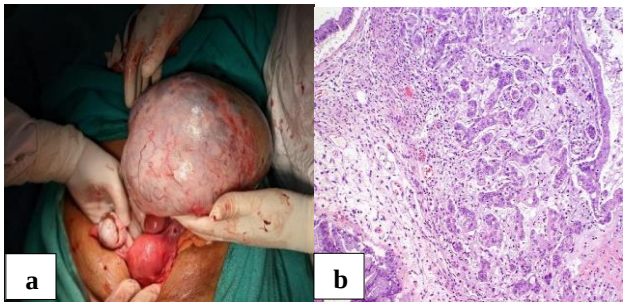

Figure 3: Patient 3 – bilateral borderline mucinous ovarian tumour (a) intraoperative-bilateral ovarian mass, and (b) final HPR.

This case highlights the importance of complete staging laparotomy in the background of Borderline nature of mucinous ovarian tumour where family is already complete.

Case 4

A 42-year-old, nulligravida presented with complaints of distension and pain abdomen for last 4 months. There is history of heavy menstrual bleeding in the past 4 months. There was no history of GI symptoms, weight loss, loss of appetite, no history of fever and cough and no comorbidities were present. General physical examination was within normal limits. Per abdominal examination revealed soft, non-tender, distended abdomen with abdomino pelvic mass 28 weeks size gravid uterus with regular smooth surface, but restricted mobility. Per speculum revealed healthy cervix and vagina however cervix was deviated to right. PV examination revealed enlarged uterus around 16 weeks size with large anterior wall fibroid of (10 cm), right fornix full with palpable cystic mass (approximately 15 cm), left fornix didn't reveal any abnormality.

Ultrasound revealed fibroid with multiloculated large right ovarian cyst (15 cm) having a probable diagnosis of fibroid with ovarian mass. Tumour markers - Ca 125-90.89 IU/ml, CA19.9-0.8 IU/ml, CEA-5.17 ng/ml, HE4-0.07 pmol/l, B-HcG-0.8 mIU/Ml, AFP-3 ng/ml, LDH-83 U/ml, and inhibin-2.3 pg/ml.

Higher imaging in the form of MRI was suggestive of large intra-mural fibroid (9.5×10.3×11.7 cm) in left lateral wall of uterus, multi-loculated cystic mass lesion (15×24.8×15.1 cm) in abdominal cavity, left ovary not visualized separately and right ovary shows simple cyst (4×3.6 cm). In view of bilateral ovarian masses on USG patient was subjected to colonoscopy and UGI endoscopy which was essentially normal. In view of menorrhagia endometrial biopsy was done which showed endometrial hyperplasia with atypia. Pap smear was NILM.

She underwent staging laparotomy with intra-op frozen which revealed mucinous carcinoma. Intra-operatively, Uterus 18 weeks size with intramural fibroid noted, long pedunculated mass from left ovary (10×15 cm) extending upto right lumbar region, no breach in capsule- no tumour on surface noted. Upper abdomen was disease free. Appendix was normal in outline hence not removed. Patient underwent TAH + BSO + peritoneal cytology + infracolic omentectomy + multiple peritoneal biopsies.

Final histopathology revealed mucinous cystadenocarcinoma left ovary (grade 1 C3). Patient received 6 cycles of chemotherapy as adjuvant.

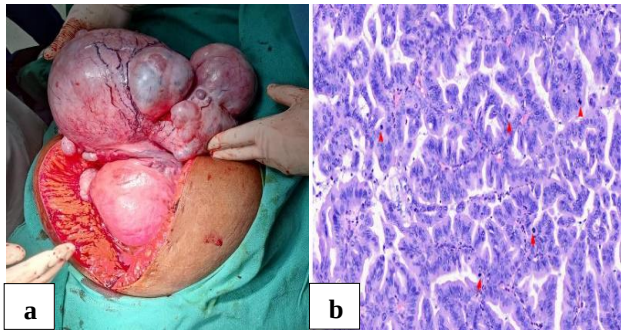

Figure 4: Patient 4 – mucinous cystadenocarcinoma (a) intraoperative-left ovarian mass, and (b) final HPR.

This case highlights the importance of staging laparotomy in perimenopausal age group nulligravida patient with raised Ca 125 and CEA levels having mucinous carcinoma and requirement of adjuvant chemotherapy based on final staging.

Case 5

A 54-year-old nulligravida presented with complaints of postmenopausal bleeding for past 6 months with occasional intermittent pain abdomen. There was no history of GI symptoms, weight loss, loss of appetite, no history of fever and cough. Comorbidities of DM and HTN were present and patient was on regular treatment for the same. General physical examination revealed an obese patient with BMI-31 kg/m^2. Per abdominal examination was essentially normal. Per speculum examination revealed healthy cervix and vagina. However, uterus was bulky 8 weeks size non-tender and anteverted. On PV examination left adnexa was normal, however right adnexa showed a mobile mass of approximately 5 cm size.

USG showed bulky uterus, ET-12 mm with bilateral ovarian masses each 3 cm in size. Tumour markers revealed Ca 125-283 IU/ml, Ca 19.9-297.86 IU/ml, HE4-400.3 pmol/ml, CEA-2.53 ng/ml, B-HcG- 0.5 mIU/Ml, and LDH-121 U/ml. Endometrial biopsy revealed Gd 1 endometroid endometrial carcinoma. Pap smear was NILM.

Higher imaging in the form of MRI pelvis revealed bulky uterus with soft tissue lesion in endometrial cavity involving cervical canal and having more than 50% myometrial invasion. Multiple heterogenous lesions in bilateral adnexa with solid deposits with size of 36×23 mm on right side and 34×24 mm in the left adnexa. Pelvic lymphadenopathy also noted

Sono-mammography, upper and lower GI endoscopy was normal.

Patient underwent staging laparotomy in view of advanced Carcinoma endometrium with likely ovarian involvement. However intra-op both ovarian masses had mucinous deposits on the surface. Intra-op frozen of both ovarian masses revealed borderline mucinous tumours. Intra-op it was a bulky uterus, bilateral adnexal masses with mucin on surface, free fluid +, omentum normal, with enlarged pelvic and para aortic LN. Surgical staging in the form of TAH + BSO + peritoneal cytology + infracolic omentectomy + multiple peritoneal biopsies + bilateral pelvic and paraaortic node dissection was done up to left renal vein.

Final histopathology and IHC markers confirmed it to be a synchronous tumour with stage 1C3 borderline mucinous tumours in both ovaries and stage III C2 endometroid adenonocarcinoma of endometrium.

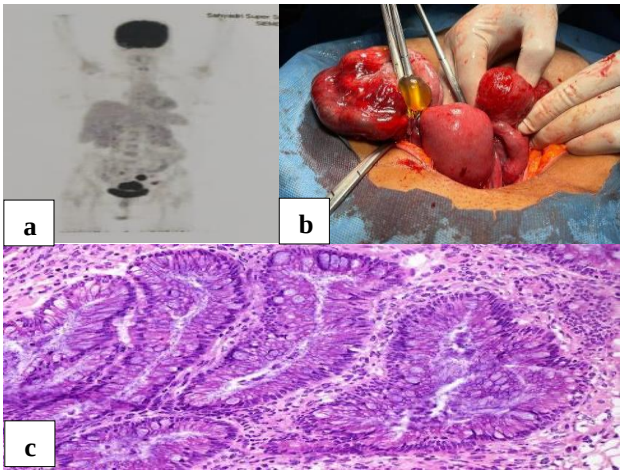

Figure 5: Patient 5–borderline mucinous ovarian tumour (a) PET-bilateral adnexal lesions, (b) intraop-B/L adnexal mass, and (c) final HPR-borderline mucinous tumours.

Patient underwent adjuvant chemotherapy in the form of sandwich therapy. She is currently under regular follow-up for last 2 years and is disease free.

This was a case of synchronous tumour with endometrioid variety of carcinoma endometrium and mucinous variety of borderline tumour in both ovaries. However, on imaging we thought it to be extension of carcinoma endometrium to both ovaries in the form of metastases, however it turned out to be an unusual presentation of synchronous tumours.

The idea behind this case is to sensitize the masses to keep the possibility of synchronous tumours in mind rather than only focusing on the possibility of ovarian metastasis in the background of cancer endometrium.

All the above cases show us the varied presentations of mucinous tumours that we can see in our clinical practice. The cases also highlight the patient specific treatment modalities for the similar cases of mucinous tumours.

DISCUSSION

Mucinous ovarian tumors have a wide spectrum of presentations be it benign, borderline, or invasive carcinomas. It is mostly seen that 65–80% of mucinous ovarian tumors are diagnosed in the early stage. Mucinous ovarian tumours are mostly large, multi-loculated cystic mass with mucus-containing fluid. Primary tumours are larger and unilateral whereas metastatic lesions are generally bilateral.[4]

Ovarian mucinous tumors develop from epithelial cells which have distinct biological characters, such as the presence of a large amount of mucus. These become very large and fill the entire abdominopelvic cavity and can cause symptoms of ureteral obstruction or abdominal compartment syndrome. Most mucinous tumors are unilateral, especially when primarily ovarian in origin however in case of bilaterality it is most likely metastatic. Otherwise, incidence of bilateral mucinous ovarian tumors is 10%. Carcinoembryonic antigen (CEA) is the most useful serum tumor marker to identify mucinous ovarian tumour.[5] At times we can have raised Ca 19.9 in the background of mucinous tumors. The role of imaging modalities such as computed tomography (CT) scan and magnetic resonance imaging can give a better idea about the extension of the tumor in the various quadrants of the abdomen and consistency of the tumor. Mucinous tumour grossly limited to the ovary do not usually have lymph node metastasis.[6]

83% of patients with mucinous ovarian tumors present at stage I of the disease, whereas only 4% of patients with epithelial serous ovarian carcinomas, are stage I at the time of diagnosis.[7] As most of mucinous tumors of the ovary are large, an exploratory laparotomy with removal of the involved adnexa is usually contemplated. In case the patient is post-menopausal, a total hysterectomy and bilateral salpingo-oophorectomy is done. Many patients who are premenopausal, having unilateral mucinous tumors, likely benign, borderline, or even invasive primary ovarian cancers, can be allowed to undergo fertility preservation surgery with conservation of the normal appearing uterus and contralateral ovary in apparent early stage of the disease.[8] The option between cystectomy or oophorectomy has to be chosen carefully as the rate of recurrence is higher in the former group. In the study by Kokas et al it is shown that a statistically significant finding of 8 out of 13 recurrences of mucinous tumors happened in patients who underwent only cystectomy.[9] Therefore, it is advisable that an oophorectomy should be preferred to a cystectomy to avoid the risk of a recurrence in the form of invasive carcinoma.

Intraoperative frozen sections of mucinous ovarian tumors help to identify the features and aids in accurate diagnosis of the tumor. However, frozen is not very reliable as benign cystadenomas, LMP tumors, and invasive mucinous carcinomas can coexist in close proximity within a tissue. This suggests a continuum from benign to borderline to invasive disease in the same mass. Therefore, coexistence of these forms can make frozen section diagnosis difficult, as only a limited number of frozen sections can be evaluated intraoperatively where these tumors are quite large. In a study 38 cases were reported to be mucinous on frozen section, 36 had mucinous histology confirmed on final pathology (94.7% concordance).[10]

To distinguish between primary mucinous tumors of the ovary and mucinous tumors metastatic from other sites may be difficult. The most common primary sites for mucinous carcinomas metastatic to the ovary are gastrointestinal, pancreas, cervix, breast, and uterus. Immunohistochemistry may also be useful in such scenarios. Primary ovarian tumors demonstrate CK7 and CK20 positivity, however colorectal primaries show CK20, uterine origin shows P16, pancreatic origin have presence of mesothelin, fascin, and prostate stem cell antigen (PSCA) and breast cancers are usually positive for estrogen receptors and gross cystic disease fluid protein (GCDFP)-15.[11]

It is seen that patients with mucinous histology were less likely to respond to platinum-based regimens compared to patients with non-mucinous histology as they are chemo resistant however some recent studies have showed sensitivity to oxaliplatin, etoposide, and 5-fluorouracil (5-FU) as single agents.[12]

Follow up of mucinous ovarian tumors involves 3 monthly checks up with detailed history and clinical examination with USG and tumour markers. CT scan once in a year or on requirement basis. Six monthly for next 3 years and annually after 5 years.

CONCLUSION

It is pertinent to remember that mucinous ovarian tumors represent a distinct histologic feature. It affects all age

groups be it young, perimenopausal or even the post-menopausal. The pathogenesis, pathologic characteristics, molecular signature, and clinical behaviour of mucinous ovarian tumors is significantly different from other epithelial ovarian tumours. This article shows the varied presentation of mucinous ovarian tumours and the patient profile specific treatment for each subset. These differences should be identified and appropriate evaluation directed therapy should be done to achieve desired patient outcomes.

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REFERENCES

1. Shanmughapriya S, Senthilkumar G, Arun S, Das BC, Natrajseenevasan K. Risk Factors for Epithelial Ovarian Carcinoma in India: A Case Control Study in Low Incidence Population. Int J Cancer Res. 2016;12:61-8.
2. Gorringe KL, Cheasley D, Wakefield MJ, Ryland GL, Allan PE, Alsop K, et al. Therapeutic options for mucinous ovarian carcinoma. Gynecol Oncol. 2020;156(3):552-60.
3. Hess V, A'Hern R, Nasiri N, King DM, Blake PR, Barton DP, et al. Mucinous epithelial ovarian cancer: a separate entity requiring specific treatment. J Clin Oncol. 2004;22(6):1040-4.
4. Frumovitz M, Schmeler KM, Malpica A, Sood AK, Gershenson DM. Unmasking the complexities of mucinous ovarian carcinoma. Gynecol Oncol. 2010;117:491-6.
5. Clement PB, Young RH. Atlas of gynecologic surgical pathology. 4th Edition. Elsevier. 2008.
6. Schmeler KM, Tao X, Frumovitz M, Deavers MT, Sun CC, Sood AK, et al. Prevalence of lymph node metastasis in primary mucinous carcinoma of the ovary. Obstet Gynecol. 2010;116(2):269-73.
7. Seidman JD, Horkayne-Szakaly I, Haiba M, Boice CR, Kurman RJ, Ronnett BM. The histologic type and stage distribution of ovarian carcinomas of surface epithelial origin. Int J Gynecol Pathol. 2004;23:41-4.
8. Gershenson DM. Treatment of ovarian cancer in young women. Clin Obstet Gynecol. 2012;55(1):65-74.
9. Koskas M, Uzan C, Gouy S, Pautier P, Lhommé C, Haie-Meder C, et al. Prognostic factors of a large retrospective series of mucinous borderline tumors of the ovary (excluding peritoneal pseudomyxoma). Ann Surg Oncol. 2011;18:40-8.
10. Venkatachalam S, Balamurugan G. Study of frozen section and lymph node in management of mucinous ovarian tumors. Int J Contemp Med Res. 2019;6(6):F1-3.
11. Frumovitz M, Schmeler KM, Malpica A, Sood AK, Gershenson DM. Unmasking the complexities of mucinous ovarian carcinoma. Gynecol Oncol. 2010;117:491-6.
12. Sato S, Itamochi H, Kigawa J, Oishi T, Shimada M, Sato S, et al. Combination chemotherapy of oxaliplatin and 5-fluorouracil may be an effective regimen for mucinous adenocarcinoma of the ovary: a potential treatment strategy. Cancer Sci. 2009;100:546-51.

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