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Case series

Primary Pouch of Douglas malignancies: A case series and review of the literature

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1. Introduction

The Pouch of Douglas (POD), also known as rectouterine pouch and posterior cul-de-sac, is bordered anteriorly by the posterior uterus and posteriorly by the rectosigmoid colon. It is lined by peritoneum which originates from remnants of the Mullerian system which does not participate in organogenesis (Lauchlan, 1972). Due to the common embryology, benign and malignant lesions which mimic the Mullerian system can develop in the POD. A second mechanism for primary POD malignancies is the malignant transformation of endometriosis.

Primary POD malignancies are rare. In an extensive search of current English literature, 31 cases of primary POD malignancies were identified, with the first case reported by Dockerty et al. (1954). Mullerian types POD tumors reported include adenosarcoma, carcinosarcoma, clear cell adenocarcinoma and papillary serous carcinoma. Other tumor types reported include placenta site trophoblastic tumor, malignant mesothelioma and extragastrointestinal stromal tumor.

This paper reports 11 cases of primary POD malignancies in a single center, the largest series so far in literature.

2. Materials and methods

Patients diagnosed with primary POD malignancies from January 2006 to December 2016 were identified from the cancer registry in KK Women's and Children's Hospital (KKWCH) Gynecology department. The final diagnoses were based on intraoperative and histological findings after our multidisciplinary meeting. Intraoperatively, these tumors may be described to be located in the POD, rectovaginal pouch or rectovaginal septum. Data collected included age at diagnosis, presenting complaints, imaging studies, surgical findings, histology, treatment and progress.

3. Results

There were 11 patients identified with primary POD malignancies in the past ten years (Table 1). All of them were diagnosed in KKWCH and had subsequent treatment within the same center except for one who returned to Malaysia after primary surgery. The youngest was 24 years old at diagnosis while the oldest was 74 years old. The presenting symptoms were varied, including abdominal pain and distension, abnormal uterine bleeding, lump at introitus and reduced stool caliber. The majority were thought to have either uterine or ovarian pathology except for four whose pre-operative scans suggested POD malignancies. Imaging modalities used included pelvic ultrasounds, magnetic resonance imaging (MRI) and computed tomography (CT). On histology post-operatively, there were seven adenocarcinomas (one unspecified, two endometrioid, one adenosquamous and three serous), two carcinosarcoma, one adenosarcoma and one perivascular epitheliod tumor (PEComa). Three patients had synchronous endometrial and POD malignancies. Four out of the seven adenocarcinomas and the adenosarcoma were found to have concurrent endometriosis as seen on histology. Five patients have died of the disease. The remaining patients have had no relapses so far at this point of writing and were disease free between 6 months to 10 years.

4. Discussion

The POD is named after the Scottish anatomist, James Douglas. It is the most dependent portion of a woman's pelvis and thus a common location for fluid, abscesses and drop metastases. Primary malignancy can also occur in the POD, albeit rare, with only 31 cases reported in English literature so far. Evaluation of a POD begins with a thorough physical examination and is aided by a variety of imaging modalities. Pelvic ultrasound is usually the imaging modality of choice to evaluate pelvic masses as it is relatively inexpensive and does not require use of a contrast agent. MRI can be valuable if the lesions need further characterization or if better delineation of soft tissues is needed to plan for surgery. However, due to rarity of primary POD malignancies and the varied presenting symptoms, POD lesions can be mistaken as lesions from ovarian or uterine origin or metastases. Case 10 (Table 1) presented with a lump in the introitus and a routine pre-vaginal hysterectomy endometrial biopsy incidentally showed endometrial cancer. The differential diagnosis based on the endometrial biopsy and the MRI finding of a POD mass was either synchronous endometrial and ovarian

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Table 1
Cases of primary POD malignancies diagnosed in KKWCH from January 2006 to December 2016.

Case no.	Age[a]	Presenting complaint	Imaging	Preoperative diagnosis[b]	Intraoperative finding	Histology of POD tumor	Concurrent endometriosis	Postoperative diagnosis	Treatment	Progress
1	51 years	Abdominal pain	US pelvis: 6 cm posterior cervical mass extending to lower uterine segment MRI: 8 cm mass involving left posterolateral wall of uterus	Leiomyosarcoma	POD filled with tumor	Endometrioid adenocarcinoma grade 2	Yes	Stage II POD endometrioid cancer	Surgery (suboptimal debulking[c]), adjuvant paclitaxel and carboplatin	Disease free 1 year 5 months
2	48 years	Prolonged menstrual bleeding	US pelvis: 0.7 cm posterior uterine wall fibroid	Endometrial complex hyperplasia, unable to exclude transformation to adenocarcinoma	2 cm rectovaginal septum tumor	Endometrioid adenocarcinoma grade 1	Yes	Synchronous Stage IA endometrial endometrioid adenocarcinoma and Stage II POD cancer	Surgery, adjuvant paclitaxel and carboplatin, radiotherapy	Disease free 5 years
3	39 years	Dysmenorrhea and menorrhagia	US pelvis: 2 cm posterior uterine wall fibroid	Endometrial endometrioid adenocarcinoma	8 cm rectovaginal septum tumor	Endometrioid adenosquamous carcinoma grade 2	No	Synchronous Stage IA endometrial endometrioid adenocarcinoma and Stage II POD adenosquamous tumor	Surgery	Unknown
4	43 years	Intermenstrual and postcoital bleeding	US pelvis: Cannot exclude underlying adenomyosis of posterior uterine wall	Endometrial endometrioid adenocarcinoma grade 2	POD obliterated, friable tissue at rectovaginal septum	Adenocarcinoma Grade 2	Yes	Synchronous endometrium endometrioid adenocarcinoma with POD tumor	Surgery, adjuvant paclitaxel and carboplatin, radiotherapy	Disease free 10 years
5	52 years	Reduced stool caliber	US pelvis: 8.1 cm complex mass posterior to cervix CTAP: 8.4 cm pelvic mass arising from upper vagina/cervix	POD mass	5 cm rectovaginal tumor	Papillary serous adenocarcinoma grade 3	No	Stage IIC POD papillary serous adenocarcinoma	Neoadjuvant paclitaxel and carboplatin, interval surgery, adjuvant paclitaxel and carboplatin, radiotherapy, vault brachytherapy	DWD 4 years 10 months
6	41 years	Abdominal discomfort and mass	US pelvis: 6 cm right pedunculated fibroid 10 cm complex left ovarian cyst	Fibroid Left ovarian cyst	Caseating rumor in POD 11 cm left ovarian tumor	Papillary serous carcinoma Grade 3 Hemorrhagic ovarian cyst	No	Stage II POD papillary serous carcinoma	Surgery, adjuvant carboplatin and paclitaxel	Disease free 8 years 2 months
7	49 years	Irregular menstrual cycles, foul smelling vaginal discharge	MRI pelvis: 8.5 cm ill-defined mass in POD involving both ovaries	Metastatic ovarian carcinoma versus sarcomatous change of tissues in POD	1 cm rectovaginal septum tumor	Serous adenocarcinoma grade 2	Yes	Stage IIIC grade 2 POD tumor	Neoadjuvant carboplatin, interval debulking surgery, adjuvant carboplatin	DWD 3 years 7 months
8	64 years	Abdominal bloating, loss of appetite Previous THBSO for POD endometrioma at 63 years	US pelvis: 4.8 cm complex lesion in POD MRI pelvis: 5.4 cm complex mass in POD	POD tumor recurrence	Large pelvic tumor	Adenosarcoma with sarcomatous overgrowth	Yes	POD adenosarcoma	Surgery (suboptimal debulking), adjuvant doxorubicin	DWD 5 months
9	64 years	Abdominal bloating Previous breast cancer at 51 years old in	MRI pelvis: 7 cm POD mass	POD tumor	5 cm rectovaginal tumor	Carcinosarcoma	No	Stage III POD carcinosarcoma	Neoadjuvant carboplatin and paclitaxel, interval surgery	DWD 3 years 7 months

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