

# Extraovarian Papillary Serous Carcinoma of the Peritoneum: A Report of Two Cases with Review of Literature

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## ABSTRACT

Extraovarian papillary serous carcinoma of the peritoneum is a rare malignancy characterized by peritoneal carcinomatosis presenting with abdominal pain and ascites. This tumor is similar to serous ovarian carcinoma in context to its clinical presentation, histologic appearance, pattern of spread, treatment and prognosis. We hereby report two cases of extraovarian papillary serous carcinoma of the peritoneum and review of literature.

**Keywords:** Peritoneal carcinoma, Papillary serous carcinoma, Extraovarian malignancy.

**How to cite this article:** Kalyani R, Narasimha A, Kumar HML, Narayanswamy S. Extraovarian Papillary Serous Carcinoma of the Peritoneum: A Report of Two Cases with Review of Literature. *J South Asian Feder Obst Gynae* 2013;5(1):42-44.

**Source of support:** Nil

**Conflict of interest:** None declared

## INTRODUCTION

Extraovarian papillary serous carcinoma also known as serous surface papillary carcinoma of the peritoneum, multiple focal extraovarian serous carcinoma, extraovarian mullerian adenocarcinoma was first described by Swerdlow in 1959 as mesothelioma of the pelvic peritoneum.<sup>1,2</sup> It is a rare malignant epithelial tumor which is known to arise from the peritoneal lining the pelvis and abdomen and is characterized by abdominal carcinomatosis.<sup>2</sup> It is indistinguishable from the primary serous ovarian carcinoma with respect to clinical presentation, histologic appearance, pattern of spread treatment and prognosis.<sup>1</sup> We hereby report two cases of extraovarian papillary serous carcinoma along with review of literature.

## CASE REPORTS

### Case 1

A 55-year-old lady presented with a history of lower abdominal pain since 10 days along with ascites. She underwent vaginal hysterectomy 5 years back and laparotomy for ovarian cyst 2 years back. The ovarian cyst was reported as papillary serous cystadenoma. On examination, a cystic mass of 18 to 20 weeks size was felt in the right lumbar region. Per speculum examination—vagina pale, no growth felt in the vault. Per vagina—fullness present in the anterior and left side of the vault.

A clinical diagnosis of residual ovarian tumor was offered.

### Peroperative Findings

Hemoperitoneum of about 2 liters was present. A large friable mass of variable consistency measuring 15 × 20 cm was seen adherent to the pouch of Douglas and sigmoid colon. All other

abdominal organs were normal. Para-aortic lymph nodes were not palpable. On laparotomy, omentum showed nodules over the surface. Tumor debulking and infracolic omentectomy was performed.

### Gross Findings

Received multiple soft tissue bits together measuring 19 × 17 × 3 cm. External surface showed gray brown to gray yellow friable areas. Also received omentectomy specimen measuring 14 × 7 × 1 cm. Surface showed multiple gray brown nodules.

### Microscopy

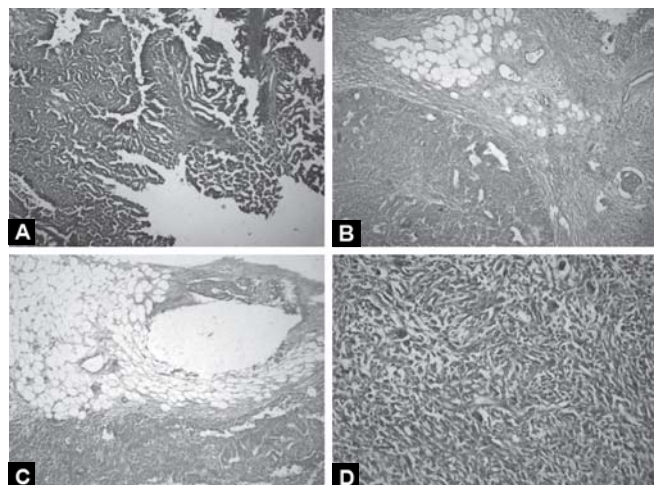
Multiple sections studied from the omental nodules showed tumor cells arranged in papillary pattern (Fig. 1A), glandular pattern (Fig. 1B) and in sheets (Fig. 1C). The tumor cells have increased nuclear:cytoplasmic ratio, vesicular, bizarre nucleus with occasional mitotic figures. Tumor giant cells are also seen (Fig. 1D). At focal areas, these cells have vacuolated cytoplasm and spindle cell differentiation.

### Impression

Extraovarian (peritoneal) papillary serous adenocarcinoma.

### Case 2

A 51-year-old lady came to the OPD for routine gynecological examination. Gynecological examination revealed a tense cyst in the Pouch of Douglas. She underwent hysterectomy and excision of the pelvic cyst.



**Figs 1A to D:** Microphotograph of extraovarian papillary serous carcinoma showing (A) papillary pattern (H&E, ×40), (B) glandular pattern (H&E, ×100), (C) in sheets (H&E, ×100) and (D) bizarre spindle cells with tumor giant cells (H&E, ×400)

### Gross Findings

Received specimen of uterus and cervix with bilateral tubes, without ovaries also received a single irregular gray brown tissue bit. Cyst wall measuring  $10 \times 6$  cm. External surface showed gray brown to gray white areas. Inner surface showed focal granular areas.

### Microscopy

Multiple sections studied from the cyst of Pouch of Douglas showed tumor cells arranged in papillary pattern (Fig. 2A). The cyst wall showed papillary excrescence (Fig. 2B). Focal areas showed calcification (psammoma bodies) (Figs 2C and D).

### Impression

Extraovarian (peritoneal) papillary serous cystadenocarcinoma.

## DISCUSSION

Extraovarian papillary serous carcinoma is defined as a primary tumor of the peritoneum that diffusely involves the peritoneal surface but spares or only superficially invades the ovaries.<sup>2</sup> It is a rare malignant epithelial tumor that is histologically indistinguishable from serous ovarian papillary carcinoma. This entity was initially described in 1959 by Swerdlow<sup>2</sup> as 'mesothelioma of pelvic peritoneum'. The other terminologies used for this tumor are peritoneal serous papillary carcinoma, extraovarian peritoneal serous papillary carcinoma, primary papillary serous carcinoma of the peritoneum, paraovarian cystadenocarcinoma, serous surface papillary carcinoma of the peritoneum, extraovarian müllerian adenocarcinoma and normal-sized ovary carcinoma syndrome.<sup>1,3</sup> Its incidence is around 8 to 15%.<sup>4</sup> It occurs exclusively in menopausal and postmenopausal women who undergo bilateral oophorectomy for benign disease or prophylaxis.<sup>3</sup> Our case reports showed its occurrence in postmenopausal women. There are case reports of this entity occurring in children<sup>5</sup> and in a man which was an incidental autopsy finding.<sup>6</sup> Several etiological factors, such as asbestos, talc or ionizing radiation exposure, have been

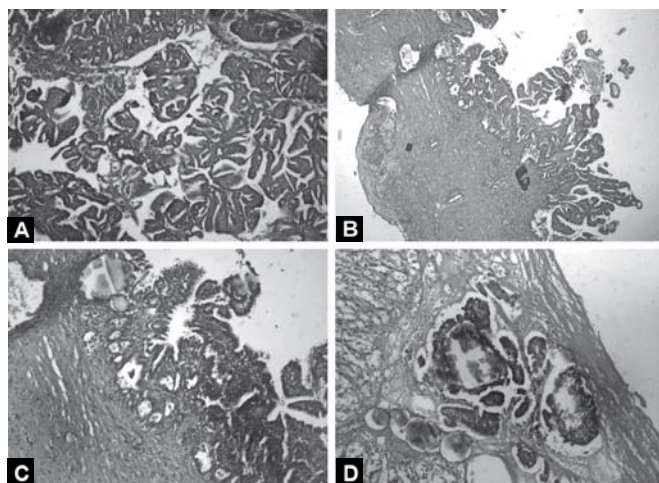
proposed but none of these have been proved conclusively. It is postulated that these particles could stimulate peritoneal and ovarian neoplasia.<sup>4</sup> An autosomal dominant type of inheritance with variable penetrance were observed by examination of the family pedigrees with familial ovarian cancer by Piver et al.<sup>7</sup> In our case reports, there was no significant family history of ovarian cancer, but one case was previously diagnosed as papillary serous cystadenoma.

The patients may present with abdominal distension, pain, nausea, vomiting, dyspepsia, change in bowel habits or a palpable mass. The common physical finding is ascites. An interesting case of primary peritoneal adenocarcinoma with massive bilateral pleural effusion with small amount of ascites was reported by Shameem et al.<sup>3</sup> In our case reports, one of the patients presented with pain abdomen, ascites as well as mass in the lumbar region, whereas the other presented as a cyst in the pouch of Douglas. Along with clinical history and examination, the diagnostic modalities include fine needle aspiration cytology and imaging techniques, such as CT or MRI. Patients with serous surface papillary carcinoma are identified in a state of peritoneal carcinomatosis. They show ascites, peritoneal thickening and nodules, and omental caking with extensive calcification on CT.<sup>8</sup>

The diagnosis of extraovarian papillary serous carcinoma should be made according to the Gynecologic Oncology Group's 1993 inclusion criteria for serous surface papillary carcinoma<sup>1</sup> as follows: (a) Both ovaries must be either physiologically normal in size or enlarged by a benign process, (b) involvement at the extraovarian sites must be greater than the involvement on the surface of either ovary, (c) microscopically, the ovarian component must be either nonexistent, confined to ovarian surface epithelium with no evidence of cortical invasion, involving ovarian surface epithelium and underlying cortical stroma but with any given tumor smaller than  $5 \times 5$  mm, or a tumor smaller than  $5 \times 5$  mm in the ovary with or without surface disease, (d) finally, the histologic and cytologic characteristics of the tumor must be predominantly of the serous type that is similar or identical to any grade of ovarian serous papillary adenocarcinoma. In our case reports one patient had a previous history of papillary serous cystadenoma of the ovary, and the other presented with pouch of Douglas cyst. Both the cases showed features of papillary serous cystadenocarcinoma.

According to Lauchlan's<sup>9</sup> theory, the serous surface papillary carcinoma probably arises from embryonic nests of the müllerian cells that are present in the peritoneum. These cells may also be present on the surface and in the stroma of the ovary and thus may give rise to serous carcinoma. This theory would explain why serous surface papillary carcinoma behaves like serous ovarian papillary carcinoma in many ways, with similar clinical, radiologic, immunohistochemical findings and similar sensitivity to chemotherapy.<sup>9</sup>

Many studies have shown that advanced-stage ovarian carcinomas are monoclonal<sup>10</sup> at ovarian and extraovarian sites. But, papillary serous carcinomas of the peritoneum appear to be multifocal in origin.<sup>10</sup> The clonality of a tumor can be



**Figs 2A to D:** Microphotograph showing (A) papillary pattern (H&E,  $\times 40$ ), (B) cyst wall with papillary excrescence (H&E,  $\times 40$ ), (C) papillary pattern (H&E,  $\times 100$ ) and (D) psammoma bodies (H&E,  $\times 400$ )

determined by X chromosome-linked and non-X-chromosome-linked analysis, such as loss of heterozygosity (LOH), gene rearrangements and point mutations.<sup>11</sup> Russell<sup>12</sup> proposed that peritoneal tumors were not metastatic in nature but arise independently in response to the same tumorigenic agents that are responsible for the ovarian tumors. However, Segal and Hart<sup>13</sup> opined that neoplastic epithelial cells become detached from the papillary excrescences growing on the external surfaces of the ovary and subsequently get implanted on the peritoneum, omentum, and serosal surfaces of other visceral organs, resulting in multifocal disease.

The histological type is usually a serous pattern but other types, such as mucinous, clear cell, endometrioid and mixed müllerian tumors, have been reported.<sup>3</sup> Both our case reports showed predominantly serous pattern. These tumors show positivity for estrogen receptor (ER), cytokeratin (CK7), Wilm's tumor suppressor gene (WT1) and cancer antigen 125 (CA125) and negative for cytokeratin 20 (CK20), progesterone receptor (PR), calretinin, carcinoembryonic antigen (CEA), gross cystic disease fluid protein (BRST-2) and thyroid transcription factor 1 (TTF1).<sup>3</sup> Extraovarian papillary serous carcinoma spreads transperitoneally, but lymphatic and hematogenous metastases have been observed by several workers. There are reports of metastasis occurring in liver, brain and lymph nodes.<sup>3</sup> No metastasis was observed in any of our cases.

The differential diagnosis of serous carcinoma of peritoneum includes peritoneal carcinomatosis due to other cancers, mesothelioma, lymphomatosis, metastatic gastrointestinal tumors or tuberculous peritonitis because the treatment strategies are different. The definitive diagnosis of this serous carcinoma by clinical or radiological examinations may be impossible and hence laparotomy followed by histopathological examination is required for final confirmatory diagnosis.<sup>14</sup>

The treatment of extraovarian papillary serous carcinoma is cytoreductive surgery followed by cisplatin-based chemotherapy.<sup>3</sup> The prognosis is poor in these patients with the median survival time varying between 7.0 and 27.8 months while 5-year survival rates ranging from 0 to 26.5%.<sup>15</sup>

## CONCLUSION

The diagnosis of extraovarian papillary serous carcinoma should be considered in an elderly women with history of abdominal pain and ascites. Definitive preoperative diagnosis may be inconclusive. However, imaging modalities and cytology followed by histopathology may give a confirmative diagnosis.

## ACKNOWLEDGMENT

We would like to thank Dr CBSR Prasad for photography.

## REFERENCES

- Bloss JD, Liao SY, Buller RE, Manett A, Berman ML, McMeekin S, et al. Extraovarian peritoneal serous papillary carcinoma: A case control retrospective comparison to papillary adenocarcinoma of the ovary. *Gynecol Oncol* 1993;50:34-51.
- Swerdlow M. Mesothelioma of the pelvic peritoneum resembling papillary cystadenocarcinoma of the ovary. *Am J Obstet Gynecol* 1959;77:197-200.
- Mohammad S, Jamal A, Ummul B, Rakesh B, Zuber A, Prakhar S, et al. Primary peritoneal adenocarcinoma causes pleural effusion. *North Am J Med Sci* 2010;2:281-84.
- Dalrymple JC, Bannatyne P, Russell P, et al. Extraovarian peritoneal serous papillary carcinoma: A clinicopathologic study of 31 cases. *Cancer* 1989;64:110-15.
- Shibata R, Matsufuji H, Morimoto T, Hosoya R, Araki K, Hata J. Extraovarian primary peritoneal carcinoma in a child. *Pediatr Blood Cancer* 2004;42:292-93.
- Shmueli E, Leider-Trejo L, Schwartz I, Aderka D, Inbar M. Primary papillary serous carcinoma of the peritoneum in a man. *Ann Oncol* 2001;12:563-67.
- Steven PM, Mohannad JF, Yoshiaki T, Guillermina N. Primary peritoneal carcinoma after prophylactic oophorectomy in women with a family history of ovarian cancer. A report of the Gilda Radner Familial Ovarian Cancer Registry. *Cancer* 1993;71:2751-55.
- Zissin R, Hertz M, Shapiro-Feinberg M, et al. Primary serous papillary carcinoma of the peritoneum: CT findings. *Clin Radiol* 2001;56:740-45.
- Lauchlan SC. The secondary müllerian system. *Obstet Gynecol Surv* 1972;27:133-46.
- Muto MG, Welch WR, Mok SC, Bandera CA, Fishbaugh PM, Tsao S, et al. Evidence for a multifocal origin of papillary serous carcinoma of the peritoneum. *Cancer Res* 1995;55:490-92.
- Jian Gu, Roth LM, Younger C, Michael H, Abdul-Karim FW, Zhang S, et al. Molecular evidence for the independent origin of extra-ovarian papillary serous tumors of low malignant potential. *J Natl Cancer Inst* 2001;93:1147-52.
- Russell P. The pathological assessment of ovarian neoplasms. I: Introduction to the common 'epithelial' tumours and analysis of benign epithelial tumours. *Pathology* 1979;11:5-26.
- Segal GH, Hart WR. Ovarian serous tumors of low malignant potential (serous borderline tumors). The relationship of exophytic surface tumor to peritoneal 'implants.' *Am J Surg Pathol* 1992;16:577-83.
- Morita H, Aoki J, Taketomi A, Sato N, Endo K. Serous surface papillary carcinoma of the peritoneum: Clinical, radiologic, and pathologic findings in 11 patients. *AJR* 2004;183:4923-28.
- Fromm GL, Gershenson DM, Silva EG. Papillary serous carcinoma of the peritoneum. *Obstet Gynecol* 1990;75:75-89.

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