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Women's Health Science Journal
ISSN: 2639-2526

The Flagellate Transition- Serous Carcinoma Ovary

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Short Communication

Volume 6 Issue 1

Received Date: May 23, 2022

Published Date: June 27, 2022

DOI: 10.23880/whsj-16000166

Abstract

Serous ovarian tumours are engendered from Mullerian epithelium and denominate a segment of surface epithelial-stromal ovarian tumours. Serous ovarian carcinoma is classified as low grade tumefaction comprising of benign, borderline and low grade malignant lesions and high grade neoplasms. Staging of serous carcinoma of ovary is appropriately achieved with American Joint Committee on Cancer (AJCC), International Federation of Obstetrics and Gynaecology (FIGO) and Tumour, Node, Metastasis(TNM) staging. Surgical resection is an optimal and curative mode of therapy.

Keywords: Serous Carcinoma Ovary; Mullerian epithelium; Serous Psammo-Carcinoma

Abbreviations: AJCC: American Joint Committee on Cancer; FIGO: International Federation of Obstetrics and Gynaecology; TNM: Tumour Node Metastasis.

Introduction

Serous neoplasms denominate a frequently discerned segment of surface epithelial-stromal ovarian tumours. Serous ovarian tumours are engendered from Mullerian epithelium [1,2]. Serous ovarian carcinoma contributes to approximately 25% of ovarian neoplasms and 40% of malignant ovarian tumefaction. Family history of disease and nulliparous state predispose to emergence of serous carcinoma. Bilateral serous ovarian neoplasms are frequent [1,2].

Benign serous ovarian tumours are constituted of serous cystadenoma, serous cyst-adenofibroma or adenofibroma [1,2]. Of surface epithelial-stromal genesis, serous ovarian tumour is classified as "Low grade" tumefaction comprising of benign, borderline and lesions of low grade malignancy [1,2]. Macroscopically, serous carcinoma emerges as a cystic lesion traversed with fibrous tissue septa and intrinsic, epithelium- layered papillary configurations which appear to deflect from surface epithelium. Cystic tumefaction is circumscribed by fibrous tissue [1,2].

Generally, benign and borderline serous ovarian carcinomas are unilocular. Cysts of benign lesions are layered with smooth, ciliated columnar epithelium and pervaded with clear fluid. Benign serous neoplasm appears devoid of stratification and pseudo-stratification of lining epithelial cells [1,2]. Upon microscopy, borderline lesions depict complex, branching papillary configurations superimposed upon surface or cyst wall. Stromal papillae are coated with atypical epithelial cells with significant nuclear and cellular stratification and pseudo-stratification. Stromal infiltration is absent. Borderline tumours configure around 15% of serous ovarian tumours [1,2].

Low grade malignant serous carcinoma of the ovary manifests distinct stromal invasion with neoplastic glands and cells [1,2]. Frequently, borderline lesions and low grade serous ovarian carcinomas exhibit calcified concretions designated as psammoma bodies [1,2]. Serous psammo-carcinoma is a low grade variant of serous ovarian tumours accompanied by mammoth accretions of psammoma bodies [1,2]. "High grade" serous ovarian carcinoma is usually

bilateral. Tumefaction is solid and cystic and exhibits focal haemorrhage and necrosis. Tumour morphology appears heterogeneous [1,2] (Table 1).

Tumour	Node	Metastasis
T1: Tumour confined to ovaries or fallopian tubes •**T1a:** Tumour confined to single ovary, fallopian tube. Malignant ascites or surface tumour cells or within peritoneal washings are absent. •**T1b:** Cancer cells in either ovaries or fallopian tubes. Absent malignant ascites. Peritoneal washings are tumour-free •**T1c:** Cancer cells in both ovaries or fallopian tubes ~capsule rupture with surgical spill(IC1) ~cancer cells on surface of one ovary or fallopian tube or capsule rupture prior to surgery(IC2) ~cancer cells within peritoneal washings or malignant ascites (IC3)	**N1:** Tumour spreads to retroperitoneal, pelvic or para-aortic lymph nodes	**M1:** Distant metastasis M1a:Malignant pleural effusion **M1b:** Deposits within pulmonary, splenic or hepatic parenchyma, gastrointestinal tract, bones, extra-abdominal lymph nodes
T2: Tumour within one or both ovaries or fallopian tubes with pelvic spread into uterus, bladder, sigmoid colon, rectum or primary peritoneal carcinoma •**T2a:** Tumour invasion into uterus or ovaries or fallopian tubes •**T2b**:Tumour upon surface or invades pelvic organs as bladder, rectum, sigmoid colon		
T3: Tumour confined to one or both ovaries or fallopian tubes or primary peritoneal carcinoma or invasion beyond pelvis •**T3a:** Cancer cells are invisible to naked eye, microscopic deposits •**T3b:** Cancer cell deposits ~2cm •**T3c:** Cancer cell deposits >2cm, upon liver or splenic capsule		

Table1: TNM classification of serous carcinoma- ovary [1,2].

As per American Joint Committee on Cancer (AJCC) and International Federation of Obstetrics and Gynaecology (FIGO), staging of serous carcinoma of ovary is denominated as

- Stage I where tumefaction is confined to singular or bilateral ovaries or fallopian tubes and tumour metastasis within retroperitoneal lymph nodes or distant sites is absent.
- Stage Ia where tumefaction is confined to singular ovary or fallopian tube. Cancer cells are absent from ovarian surface or peritoneal or abdomino-pelvic washings. Malignant ascites is absent. Tumour metastasis within retroperitoneal lymph nodes or distant sites is absent.
- Stage Ib where tumefaction is confined to bilateral ovaries or fallopian tubes. Cancer cells are absent from ovarian surface or peritoneal or abdomino-pelvic washings. Malignant ascites is absent. Tumour metastasis within retroperitoneal lymph nodes or distant sites is absent.
- Stage Ic where tumefaction occurs within singular or bilateral ovaries or fallopian tubes and tumour metastasis within retroperitoneal lymph nodes or distant sites is absent [3,4].
  - ✓ Capsule rupture with surgical spill of neoplastic cells into abdomino-pelvic cavity (IC1).
  - ✓ Cancer cells disseminated upon surface of singular ovary or fallopian tube with capsule rupture prior to surgery (IC2).
  - ✓ Cancer cells discernible within peritoneal or abdomino-pelvic washings or malignant ascites (IC3) [3,4].
- Stage II where tumour incriminates unilateral or bilateral ovaries or fallopian tubes with extension into pelvic organs as uterus, urinary bladder, sigmoid colon, rectum or primary peritoneal carcinoma. Tumour metastasis within retroperitoneal lymph nodes or distant sites is absent.
- Stage IIa where tumour infiltrates into uterus or ovaries or fallopian tubes. Tumour metastasis within

retroperitoneal lymph nodes or distant sites is absent [3,4].

- Stage IIb where tumour deposits appear upon the surface or infiltrate pelvic organs as urinary bladder, rectum or sigmoid colon. Tumour metastasis within retroperitoneal lymph nodes or distant sites is absent [3,4].
- Stage III subdivided into
  - ✓ Stage IIIA1 where tumefaction involves unilateral or bilateral ovaries or fallopian tubes or primary peritoneal carcinoma with infiltration of pelvic organs and dissemination into retroperitoneal, pelvic or para-aortic lymph nodes. Distant metastasis is absent [3,4].
  - ✓ Stage IIIA2 where tumefaction involves unilateral or bilateral ovaries or fallopian tubes or primary peritoneal carcinoma with infiltration of pelvic organs. Carcinoma cell deposits are invisible to naked eye although can be discerned microscopically. Dissemination into retroperitoneal, pelvic or para-aortic lymph nodes may or may not occur. Distant metastasis is absent [3,4].
  - ✓ Stage IIIb where tumefaction involves unilateral or bilateral ovaries or fallopian tubes or primary peritoneal carcinoma with infiltration of pelvic organs. Carcinoma cell deposits are ~ 2 centimetre magnitude and discernible to naked eye. Dissemination into retroperitoneal, pelvic or para-aortic lymph nodes may or may not occur. Distant metastasis is absent [3,4].
  - ✓ Stage IIIc where tumefaction involves unilateral or bilateral ovaries or fallopian tubes or primary peritoneal carcinoma with infiltration of pelvic organs. Carcinoma cell deposits appear upon hepatic or splenic capsule and exceed > 2 centimetre magnitude. Dissemination into retroperitoneal, pelvic or para-aortic lymph nodes may or may not occur. Distant metastasis is absent [3,4].
- Stage IV where tumour involves unilateral or bilateral ovaries
  - ➢ Stage IVa where malignant pleural effusion occurs. Neoplastic dissemination into liver, spleen, gastrointestinal tract or extra-abdominal lymph nodes is absent [3,4].
  - ➢ Stage IVb where tumefaction extends into hepatic, pulmonary or splenic parenchyma, bones or extra-abdominal lymph nodes [3,4].

Surgical resection is an optimal and curative mode of therapy for benign serous ovarian tumours. Tumour alleviation with surgical extermination of low grade serous neoplasms may be possible [3,4]. Serous ovarian carcinomas commonly exhibit tumour dissemination into regional lymph nodes. Bulky peritoneal and omental metastasis are frequently discerned [3,4]. Enhancing tumour stage is associated with decimating 5 year survival wherein stage III serous carcinoma exemplifies ~25% proportionate survival [3-6] (Figures 1 & 2).

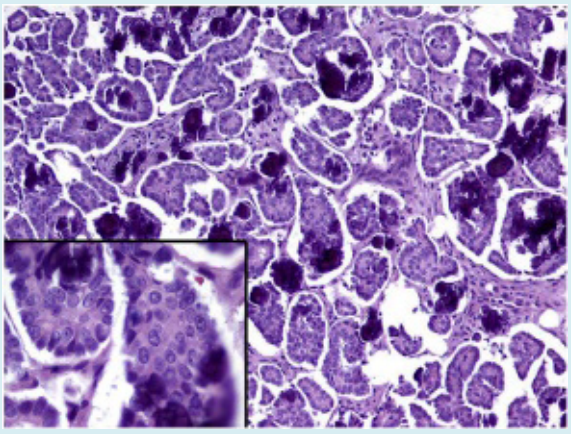

Figure 1: Serous carcinoma ovary with several psammoma bodies and papillary projections layered with ciliated columnar epithelium [5].

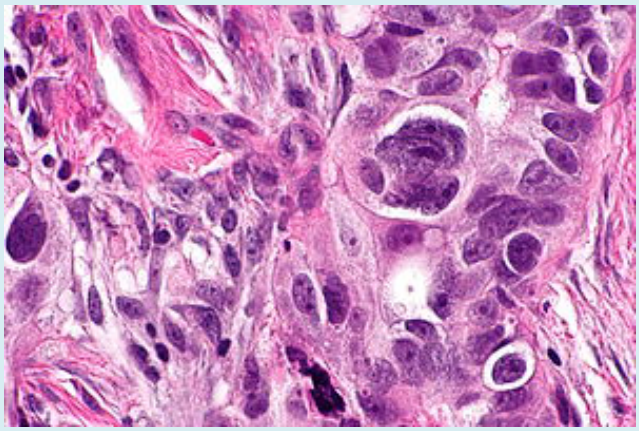

Figure 2: Serous carcinoma ovary depicting significant cellular and nuclear pleomorphism and nuclear atypia with surrounding fibrotic mesenchymal stroma [6].

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5. Image 1 Courtesy: Science direct.

6. Image 2 Courtesy: Libre Pathology.