Ovarian cancer remains largely a surgically staged disease. The process of updating the staging classification of ovarian, fallopian tube, and primary peritoneal cancer started 4 years ago with a proposal that was sent to all relevant gynecology oncology organizations and societies throughout the world and input was collated, evaluated, and formulated into the staging that is presented below. All suggestions are based on the best available evidence. The committee acknowledged that there are areas that are not supported by strong evidence and has been careful to ensure that changes are not made without quality evidence when available. The new staging below was approved by the International Federation of Gynecology and Obstetrics (FIGO) in the staging classification of ovarian cancer and the reasoning behind those changes [1]. Even if the FIGO Committee on Gynecologic Oncology utilized the best evidence currently available, this is always a somewhat subjective process. Furthermore, one needs to be aware that FIGO is an international organization that must take into account the needs of women with gynecologic cancers throughout the world, and not just those from countries that are resource rich. The first FIGO ovarian cancer staging was published in 1973 in Volume 15 of the FIGO Annual Report. Since that time there have been two other changes including this one in 1988 and 2013.

Ovarian cancer is not one disease. Several distinct tumors with unique clinical and pathological features may arise in the ovary. Approximately 90% of ovarian cancers are carcinomas (malignant epithelial tumors) and, based on histopathology, immunohistochemistry, and molecular genetic analysis, at least 5 main types are currently distinguished: high-grade serous carcinoma (HGSC [70%]); endometrioid carcinoma (EC [10%]); clear-cell carcinoma (CCC [10%]); mucinous carcinoma (MC [3%]); and low-grade serous carcinoma (LGSC [less than 5%] [2]). These tumor types (which account for 98% of ovarian carcinomas) can be reproducibly diagnosed by light microscopy and are essentially different diseases, as indicated by differences in epidemiologic and genetic risk factors; precursor lesions; ways of spread; and molecular changes during oncogenesis, response to chemotherapy, and outcome [3] Much less frequent are malignant germ cell tumors (dyserminomas, yolk sac tumors, and immature teratomas [3% of ovarian cancers]) and potentially malignant sex cord-stromal tumors (1–2%, mainly granulosa cell tumors). The biomarker expression profile within a given histotype is consistent across stages. In short, ovarian cancers differ primarily based on histotype.

Primary fallopian tube cancer and primary peritoneal cancer are rare malignancies but share many clinical and morphologic similarities with HGSC; i.e., the most common type of ovarian cancer (in the past, referred to as “papillary serous carcinoma”) and the prototype tumor occurring in women with BRCA1 or BRCA2 germline mutations. In these patients, compelling evidence for a tubal derivation of their tumors, mainly those encountered at early stage, has accumulated over the past decade [4–6]. Evidence of a tubal origin is weaker in the far more common sporadic HGSCs, and a multicentric origin of these tumors (i.e. arising from ovarian surface mesothelial invaginations or cortical inclusion cysts, implantation of tubal-type epithelium into the ovary [endosalpingiosis], or the pelvic peritoneum [the so-called secondary müllerian system]) cannot be ruled out. Recently, it has been hypothesized that cytokeratin7-positive embryonic/stem cells would be capable of mullerian differentiation in cortical inclusion cysts resulting from ovarian surface epithelium (mesothelium) invaginations. Thus, embryonic progenitors would give rise to immunophenotypically distinct neoplastic progeny [7] which would support the old concept of “müllerian neomentaplasia.” On the other hand, it has been demonstrated that the vast majority of ECs and CCCs arise in the ovary from endometriosis.

Based on the putative tubal or peritoneal origin of a number of BRCA + HGSCs, and the fact that they are managed clinically in a similar manner regardless their ovarian, tubal, or peritoneal derivation, most FIGO Committee members felt that FIGO staging of ovarian, peritoneal, and fallopian tube cancers should be considered collectively [8]. The primary site (i.e. ovary, fallopian tube, or peritoneum) should be designated wherever possible. In some cases, it might not be possible to delineate the primary site clearly; such cases should be listed as “undesignated.”

The 2014 FIGO staging for ovarian, fallopian tube and peritoneal cancer is given in Table 1. The proposed staging system is noted below (Table 1). Much less frequent are malignant germ cell tumors (dyserminomas, yolk sac tumors, and immature teratomas [3% of ovarian cancers]) and potentially malignant sex cord-stromal tumors (1–2%, mainly granulosa cell tumors). The biomarker expression profile within a given histotype is consistent across stages. In short, ovarian cancers differ primarily based on histotype.

Table 1. 2014 FIGO staging for ovarian, fallopian tube and peritoneal cancer

<table>
<thead>
<tr>
<th>FIGO Stage</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Primary tumor limited to primary site</td>
</tr>
<tr>
<td>2</td>
<td>Primary tumor plus one or more regions</td>
</tr>
<tr>
<td>3</td>
<td>Primary tumor plus any distant metastases</td>
</tr>
</tbody>
</table>

This editorial is written to make the readership aware of the recent changes that have been made by the International Federation of Gynecology and Obstetrics (FIGO) in the staging classification of ovarian cancer and the reasoning behind those changes [1]. Even if the FIGO Committee on Gynecologic Oncology utilized the best evidence currently available, this is always a somewhat subjective process. Furthermore, one needs to be aware that FIGO is an international organization that must take into account the needs of women with gynecologic cancers throughout the world, and not just those from countries that are resource rich. The first FIGO ovarian cancer staging was published in 1973 in Volume 15 of the FIGO Annual Report. Since that time there have been two other changes including this one in 1988 and 2013.

Clinical Commentary

2014 FIGO staging for ovarian, fallopian tube and peritoneal cancer
ch...
Table 3

Explantation of the Staging Changes

<table>
<thead>
<tr>
<th>Stage I</th>
<th>Disease confined to the ovary after comprehensive staging</th>
<th>Stage II ovarian cancer includes disease confined to the pelvis (below the pelvic brim). It involves one or both ovaries or fallopian tubes with pelvic extension or primary peritoneal cancer.</th>
<th>Stage III ovarian cancer involves 1 or both ovaries, fallopian tubes, or is primarily from the peritoneum with historically confirmed spread outside of the pelvis and/or metastases to the retroperitoneal nodes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA</td>
<td>Stage IA and IB are unchanged from the 1988 staging. IA remains tumor limited to one ovary (capsule intact) or fallopian tube. There can be no disease on the ovary or fallopian tube surface. There are no malignant cells in SIC 1273 and peritoneal washings. The primary peritoneal has no Stage IA; IB is unchanged and remains tumor limited to both ovaries with capsule intact or fallopian tubes; and there can be no malignant cells on ovarian or fallopian tube surfaces. There are no malignant cells in the peritoneal cavity.</td>
<td>Stage II ovarian cancer remains controversial and ill defined. It comprises a small group of ovarian cancer patients that have direct extension of their tumors to other pelvic organs without evidence of metastatic disease. However, it also includes a group of patients that has metastases to the pelvic peritoneum. In this second group of patients, disease is similar to that of stage III patients. Disease invading through the bowel wall and into the mucosa increases the stage to IVB.</td>
<td></td>
</tr>
<tr>
<td>IB</td>
<td>1C represents disease confined to one or both ovaries with capsule rupture during surgery. 1C2 represents rupture before surgery or tumor excrescences on the surface of the tube or ovary.</td>
<td>Comments: Stage II ovarian cancer remains controversial and ill defined. It comprises a small group of ovarian cancer patients that have direct extension of their tumors to other pelvic organs without evidence of metastatic disease. However, it also includes a group of patients that has metastases to the pelvic peritoneum. In this second group of patients, disease is similar to that of stage III patients. Disease invading through the bowel wall and into the mucosa increases the stage to IVB.</td>
<td></td>
</tr>
</tbody>
</table>

Conflict of interest statement

The authors declare that there are no conflicts of interest.

References


David G. Mutch
Department of Obstetrics and Gynecology, Washington University School of Medicine, 4911 Barnes Hospital Plaza, St. Louis, MO 63110, United States

Jaime Prat
Department of Pathology, Hospital de la Santa Creu i Sant Pau, Autonomous University of Barcelona, Sant Quintí, 87-89, 08041 Barcelona, Spain