

Specimen integrity (Core)

Assessment of the integrity of the specimen (ovary or tube) is important, particularly for substaging of organ-confined disease (Stage I). Core information should include whether the ovarian capsule or tubal serosa is intact or ruptured, and also if there is tumour on the surface, or whether the tumour was received fragmented or intact. In case of capsule rupture, it is recommended to try to ascertain if rupture occurred before or during surgery (this is important in substaging International Federation of Gynaecology and Obstetrics (FIGO) Stage IC disease).¹ Note that if the specimen ruptures within a bag during laparoscopic removal, or is cut into in the operating room, after removal from the patient, such that the peritoneal cavity is not exposed to the contents of the mass, it should be considered to be not ruptured i.e., 'intact', for surgical pathology reporting purposes.

According to the 2014 FIGO Staging System for ovarian, tubal and primary peritoneal cancer,¹ ovarian capsular or tubal serosal rupture before surgery is considered Stage IC2 while intraoperative rupture is Stage IC1. There is some controversy as to whether rupture during surgery worsens the prognosis in the absence of surface excrescences, ascites or positive washings. Some studies showed a higher risk of recurrence in association with intraoperative ovarian capsular rupture,^{2,3} while others did not.⁴⁻⁶

A 2014 meta-analysis assessed the impact of intraoperative rupture on prognosis, after analysing nine eligible studies which included 2,382 patients.¹ Patients with preoperative capsular rupture showed poorer progression-free survival (PFS) than those with no rupture or intraoperative rupture. In sub-analyses, preoperative rupture was associated with a worse prognosis, and intraoperative rupture had a poorer PFS than no rupture. However, no difference in PFS was found between intraoperative rupture and no rupture in patients who underwent a complete surgical staging operation, with or without adjuvant platinum-based chemotherapy. In a recent large study, the risk associated with intra-operative rupture/Stage IC1 ovarian carcinoma was histotype dependent and greatest for patients with clear cell carcinoma.⁷

There is some evidence to suggest that clear cell carcinomas exhibit a higher risk of rupture,⁸ probably related to adhesions to the surrounding tissues, associated with tumour invasion or endometriosis.⁹ Capsular rupture has also been associated with pregnancy.¹⁰

References

- 1 Prat J and FIGO Committee on Gynecologic Oncology (2014). Staging classification for cancer of the ovary, fallopian tube, and peritoneum. *Int J Gynaecol Obstet.* 124:1-5.
- 2 Vergote I, De Brabanter J, Fyles A, Bertelsen K, Einhorn N, Sevelda P, Gore ME, Kaern J, Verrelst H, Sjövall K, Timmerman D, Vandewalle J, Van Gramberen M and Tropé CG (2001). Prognostic importance of degree of differentiation and cyst rupture in stage I invasive epithelial ovarian carcinoma. *Lancet.* 357:176-182.
- 3 Bakkum-Gamez JN, Richardson DL, Seamon LG, Aletti GD, Powless CA, Keeney GL, O'Malley DM and Cliby WA (2009). Influence of intraoperative capsule rupture on outcomes in stage I epithelial ovarian cancer. *Obstet Gynecol* 113:11-17.
- 4 Seidman JD, Yemelyanova AV, Khedmati F, Bidus MA, Dainty L, Boice CR and Cosin JA (2010). Prognostic factors for stage I ovarian carcinoma. *Int J Gynecol Pathol* 29:1-7.
- 5 Dembo AJ, Davy M, Stenwig AE, Berle EJ, Bush RS and Kjorstad K (1990). Prognostic factors in patients with stage I epithelial ovarian cancer. *Obstet Gynecol* 75:263-273.
- 6 Ahmed FY, Wiltshaw E, A'Hern RP, Nicol B, Shepherd J, Blake P, Fisher C and Gore ME (1996). Natural history and prognosis of untreated stage I epithelial ovarian carcinoma. *J Clin Oncol* 14:2968-2975.
- 7 Matsuo K, Machida H, Yamagami W, Ebina Y, Kobayashi Y, Tabata T, Kaneuchi M, Nagase S, Enomoto T and Mikami M (2019). Intraoperative capsule rupture, postoperative chemotherapy, and survival of women with Stage I epithelial ovarian cancer. *Obstet Gynecol* 134(5):1017-1026.
- 8 Timmers PJ, Zwinderman AH, Teodorovic I, Vergote I and Trimbos JB (2009). Clear cell carcinoma compared to serous carcinoma in early ovarian cancer: same prognosis in a large randomized trial. *Int J Gynecol Cancer* 19:88-93.
- 9 Higashi M, Kajiyama H, Shibata K, Mizuno M, Mizuno K, Hosono S, Kawai M, Nakanishi T, Nagasaka T and Kikkawa F (2011). Survival impact of capsule rupture in stage I clear cell carcinoma of the ovary in comparison with other histological types. *Gynecol Oncol* 123:474-478.
- 10 Gottheil S and McGee J (2013). Endometrioid ovarian carcinoma during pregnancy presenting with acute rupture. *J Obstet Gynaecol Can* 35:1020-1022.