

## The Role of Laparoscopy and the Value of Peritoneal Carcinomatosis Index in Patients with Intra-Abdominal Malignancies who are Scheduled to Laparotomy

To improve disease-free survival and/or overall survival (DFS and/or OS) of patients with advanced epithelial ovarian cancer/primary fallopian tube cancer/primary peritoneal serous carcinoma (EOC/PFTC/PPSC), combination of optimal debulking surgery and adjuvant chemotherapy is the only option for enhancing long-term OS of these patients with EOC, PFTC, and PPSC.<sup>[1-3]</sup> Although there are many strategies available and some of them, such as hyperthermic intraperitoneal chemotherapy (HIPEC), dose-intense therapy, metronomic therapy, anti-angiogenesis agents, targeted therapy, immunomodulation agents, and many uncertain investigated agents, reported their benefits on survival,<sup>[4-8]</sup> there is no doubt that many of them only increase long-term DFS without increasing OS. To achieve the better chance of survival, sometimes, complete optimal cytoreductive surgery should include resection of segments of the digestive tract, spleno-pancreatectomy, diaphragmatic resection, peritonectomy, and removal of bulk-sized lymph nodes near vital organs and/or vessels.

The treatment was, for a long time, a first surgery as complete as possible followed by adjuvant chemotherapy; however, primary optimal debulking surgery, as shown above, is often associated with substantial morbidity, including complications that might delay chemotherapy. Therefore, neoadjuvant chemotherapy (NACT) followed by interval debulking surgery and adjuvant chemotherapy has become an increasingly suggestive alternative to the primary cytoreductive surgery for the management of women with far-advanced EOC/PFTC/PPSC.<sup>[9,10]</sup> The American Society of Clinical Oncology and the European Society for Medical Oncology recommended NACT for women who have a high per-operative risk profile (patients with poor performance status and low albumin levels) and/or a low likelihood of primary optimal debulking surgery (patients with very extensive tumor dissemination) based on the NACT-related benefits, such as less perioperative and postoperative morbidity and mortality and shorter hospitalization.<sup>[10]</sup> Therefore, the identification of patients with extensive disease who are likely to have unsuccessful primary cytoreductive surgery is important.<sup>[11]</sup>

Several different scoring systems have been introduced to quantify the tumor extent in the abdomen and the

involvement of the peritoneum,<sup>[11,12]</sup> the Sugarbaker's Peritoneal Cancer (Carcinoma) Index (PCI), ranging from 0 to 39, has been accepted as one of the most appropriate intraoperative staging system and regarded it as a standard, based on the effectiveness in predictive the prognosis.<sup>[13]</sup> However, the PCI score system was originally created to be used intraoperatively but is now also applied in the preoperative status of the patients with far-advanced stage EOC/PFTC/PPSC, since survival is strongly correlated with the size of residual tumor after primary cytoreductive surgery.<sup>[11]</sup> To achieve this goal, many examinations were tested. Among these, preoperative radiological imaging, especially computed tomography (CT) is the most common acceptance for the patients with EOC/PFTC/PPSC to exclude the distant metastasis and to estimate the extent of peritoneal tumor spreading regarding PCI scores.<sup>[13]</sup> However, some reported showed that these noninvasive diagnostic methods, including physical examination, ultrasound, CT, and serum markers, and even though combination of various imaging techniques and clinical features as the prediction models did not predict completeness of primary cytoreductive surgery accurately, suggesting that other tools should be considered to be useful to prevent futile laparotomy in daily practice.<sup>[11]</sup> In the April-June issue of the Gynecology and Minimally Invasive Therapy, Dr. EI-Agwany published an interesting article, entitled "Laparoscopy and CT imaging in advanced ovarian tumors: A roadmap for prediction of optimal cytoreductive surgery."<sup>[14]</sup> The author analyzed 15 patients with far-advanced stage EOC who had an abdominal CT PCI score <15 and these 15 patients underwent three-port laparoscopy evaluation. Finally, the author found that laparoscopy failed to evaluate six patients clearly (40%), due to severe dense adhesion (previous surgery, such as cholecystectomy and splenectomy, and total obliteration of tumor embedding into the cul-de-sac, and invisible areas, such as the posterior surface of the diaphragm).<sup>[14]</sup> However, CT failed to detect seven patients (46.7%) accurately, including four cases diagnosed with an in-operable condition by laparoscopy and three cases with missed detection of terminal ileum involvement >50% by CT.<sup>[14]</sup> Therefore, the author concluded that laparoscopy is a useful adjunct with CT and combination of CT and laparoscopy might be a better assessment for patients with far-advanced stage EOC before

a plan of primary cytoreductive surgery. I congratulate the success of the publication. This article is interesting. At least two parts should be emphasized.

First, the role of laparoscopy in the ovarian cancer is relatively clear, and it is a promising test because of the high specificity of laparoscopy in diagnosing resectability and good sensitivity. The use of criteria for the unresectable disease will result in no patients inappropriately unexplored or reduce the number of futile laparotomies significantly.<sup>[11,15]</sup> If one would like to proceed with primary “optimal” cytoreductive surgery for these far-advanced stage EOC patients, the performance of diagnostic laparoscopy first is reasonable.<sup>[11]</sup> No one can always be against the value of the laparoscopy in the evaluation of the patients with far-advanced stage EOC.

Second, evidence has shown the value of PCI, even before and during operation in the prediction of outcomes of the patients with various kinds of intra-abdominal malignancies. Physicians, especially surgical oncologists, including gynecologic oncologists should be familiar with this system. The use of this application should not be only limited to the patients who undergo HIPEC treatment.

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### Conflicts of interest

There are no conflicts of interest.



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