

## Ushering in a New Era for Regional Therapies

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The 11th International Symposium of Regional Therapies at Chandler, AZ, highlighted some of the advances in immunotherapy, cancer genetics, and outcomes research occurring in the field of oligo-metastatic disease. In this special educational review series, we attempt to highlight some of the research presented by leading institutions acknowledging that only with collaboration will the field move at an acceptable pace.

While this progress had humble beginnings, the role of regional therapies in the management of patients with metastatic disease is more defined and effective than ever before. This year has seen continued progress in the development, initiation, and completion of large multi-institutional, randomized, clinical trials both in the United States and Europe, specifically addressing regional therapies. Endorsement of the role of regional therapies in the field of peritoneal disease occurred from major oncology societies and a closer affiliation of the symposium with the Society of Surgical Oncology (SSO) now exists.

In this series, an invited article from Dr. Paul Sugarbaker summarizes highlights of the Peritoneal Surface Oncology Group International (PSOGI) meeting in October 2016. The first two articles in the series represent outcomes of patients undergoing cytoreductive surgery and intra peritoneal chemotherapy at experienced centers in the United States. While young adults often are believed to have worse oncological outcomes from CRS+HIPEC, Dhir and colleagues demonstrate improved histology specific oncological outcomes in young adults and adolescents.<sup>1</sup> In the second article by Ihemelandu, patients with peritoneal

metastases of colonic origin treated over 20 years with CRS+HIPEC had an overall median survival of 21.5, and 36.6 months when undergoing a complete cytoreduction (CC-0/CC-1).<sup>2</sup>

In attempting to understand the outcomes from CRS+HIPEC, Chouliaras et al. identifies GI leak, which occurred in 8.7% of patients (of 1270), as a significant source of morbidity and mortality, yielding worse oncological outcomes.<sup>3</sup> Additional work from Ihemelandu and Sugarbaker discusses preoperative inflammatory markers suggest a role for CA 19-9, Onodera's nutrition index, and a platelet-lymphocyte ratio to predict long-term survival.<sup>4</sup> These concepts reinforce evidence that preoperative selection, optimization, and surgical technique are keys in the oncological efficacy of regional therapies.

Wright et al. demonstrate value of similar principles by showing the feasibility of a liver resection after yttrium-90 arterial embolization.<sup>5</sup> While a high morbidity procedure, the median overall survival was prolonged beyond 25 months in a cohort of select patients with initially unresectable liver metastases. Similarly, in a selected cohort of 511 patients, Di Giorgio et al. demonstrate oncological safety and overall survival outcomes of 54 months in patients with advanced ovarian cancer.<sup>6</sup>

While there remains significant heterogeneity in the delivery of regional therapies, Maciver et al. show the variation in perioperative practices of the treatment of peritoneal surface malignancies among centers in the United States and stress the need for a more uniform approach in perioperative management.<sup>7</sup>

The last article by Chan et al. examines a preclinical model of cathepsin based fluorescence imaging in detecting peritoneal disease.<sup>8</sup> As a proof of concept, this approach carries the potential to guide interventions to a goal of complete cytoreduction and thus positive impact on survival.

As we usher in a new era of regional therapies that integrates immunotherapy, precision chemotherapy, cancer genetics, big data informatics, and health services research with surgery, the future is rife with opportunities to help make the lives of our patients better.

**DISCLOSURE** Kiran K. Turaga—Honoraria: CARIS Biosciences, CASTLE Biosciences.

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