

Cytoreductive Surgery and Heated Intraperitoneal Chemotherapy for Advanced Abdominal Cancers

► Endocrine and oncologic surgeons at Penn Medicine are performing open cytoreduction surgery (CRS) in conjunction with hyperthermic intraperitoneal chemotherapy (HIPEC) to treat advanced peritoneal carcinomatosis. Penn Medicine is among a small number of academic medical centers in the region performing the HIPEC procedure.

The goal of open cytoreductive surgery is complete removal of all visible tumor (generally to a size of 2.5 mm or less) in the abdominal cavity. Cytoreductive procedures are aggressive and thorough, and have an average duration of about seven hours. Following removal of all visible tumor, heated chemotherapeutics (HIPEC) are administered directly into the abdominal cavity to eradicate any microscopic or small volume disease. HIPEC works by increasing the direct tumor toxicity of chemotherapeutic drugs, as well as their distribution and penetration. Delivery of chemotherapy directly into the peritoneum has been shown to substantially increase drug exposure to the peritoneal surface.

At Penn Medicine, procedures involving CRS with HIPEC are multidisciplinary, involving surgical and medical oncologists, anesthesiologists experienced in performing extended surgeries and critical care specialists who provide aftercare.

CRS with HIPEC therapy is used for the treatment of patients with pseudomyxoma peritonei, primary peritoneal mesothelioma, and select patients with carcinomatosis from appendiceal, colorectal, gastric and ovarian primary cancers with disease confined to the abdominal cavity. Patients with these advanced cancers have frequently been previously treated with other therapies and have limited options beyond CRS with HIPEC.

Case Study

Mrs. S, a 68 year old woman, was referred to the Division of Endocrine and Oncologic Surgery with a history of mucinous colon adenocarcinoma for which she had undergone a partial colectomy two years prior with subsequent chemotherapy.

During follow-up for her surgery, Mrs. S was noted to have a rising level of carcinoembryonic antigen (CEA), a tumor marker for cancers of the gastrointestinal tract. A CT examination at this time demonstrated a new cystic mass in her right ovary with questionable other smaller masses in her abdomen (Figure 1).



► **Figure 1:** CT scan of the pelvis demonstrating right ovarian cystic mass in a patient with a history of mucinous colorectal carcinoma.

Subsequently, a needle aspiration biopsy confirmed a recurrence of colon cancer with no evidence of spread beyond the abdomen. After a consultation, Mrs. S agreed to cytoreduction surgery followed by HIPEC. Her debulking surgery included resection of both ovaries (which were involved by tumor) and resection of smaller tumor nodules in the retroperitoneum.

Following the surgical removal of the tumors, Mrs. S had inflow and outflow catheters placed in her abdominal cavity with temperature probes, and her abdomen was temporarily closed. A perfusion pump then infused a chemotherapeutic solution heated to 42° C into the peritoneal cavity where it circulated continuously for 90 minutes. The chemotherapy solution was then washed out, the catheters were removed and the abdomen was closed.

Mrs. S remained in the ICU for two days for close observation following her surgery, and another eight days in the hospital prior to discharge. A CT scan at her most recent follow-up visit found no evidence of recurrence.

Faculty Team

The Endocrine and Oncologic Surgery (EOS) program at PENN offers surgical expertise and multidisciplinary care for patients with a wide variety of benign and malignant tumors of the endocrine system and with gastrointestinal, skin and soft tissue malignancies. The EOS program is committed to achieving outstanding patient outcomes and to improving the future of care through basic science and clinical research efforts.

Performing HIPEC at Penn Medicine

Endocrine and Oncologic Surgery

Douglas L. Fraker, MD

Chief, Division of Endocrine and Oncologic Surgery

Jonathan E. Rhoads Professor of Surgical Science

Giorgos C. Karakousis, MD

Associate Professor of Surgery

Anesthesiology and Critical Care

Eric P. Greenblatt, MD

Professor of Anesthesiology and Critical Care

Perfusionists

Doreen Cowie, CCP, LP

Kathryn Gray DeAngelis, CCP, MHA

Access

Abramson Cancer Center

Perelman Center for Advanced Medicine

West Pavilion, 4th Floor

3400 Civic Center Boulevard

Philadelphia, PA 19104



Penn Medicine

800.789.PENN PennMedicine.org

Penn PhysicianLink[®]

Consults • Referrals • Transfers

For more information on how to make **Penn PhysicianLink** work for your practice and your patients, call **877.937.PENN (7366)** or visit **PennMedicine.org/PhysicianLink**.