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Research Article

Selection Criteria for Cytoreductive Surgery and Hipec for Treatment of Peritoneal Metastases

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ABSTRACT

Peritoneal metastases (PM) from gastrointestinal and gynecological primaries pose a poor prognosis, but cytoreductive surgery (CRS) with hyperthermic intraperitoneal chemotherapy (HIPEC) offers potential survival benefits in select cases. This mini-review outlines key selection criteria: low disease burden (Peritoneal Cancer Index 70), manageable comorbidities, and favorable tumor biology. Completeness of cytoreduction (CC-0/1) is essential, best achieved in highvolume centers. Preoperative assessment via CT, MRI, PET, and laparoscopy guides decisions, with 3-year survival ranging from 5-10% (gastric PM) to 50-60% (ovarian PM). Multidisciplinary expertise optimizes outcomes while minimizing risks.

Keywords

Peritoneal metastases, cytoreductive surgery, hyperthermic intraperitoneal chemotherapy.

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Introduction

Cytoreductive surgery (CRS) and hyperthermic intraperitoneal chemotherapy (HIPEC) is extensive surgical treatment for patients with peritoneal metastasis (PM).

One of the major challenges is the efficient patient selection for this procedure. This review aims to give a comprehensive overview of the management of PM with emphasis on patient selection and discussed the most important factors according to the literature [1,2].

Peritoneal metastasis

Peritoneal surface malignancies are generally associated with poor prognosis and rapid disease progression.

A major part are peritoneal metastasis (PM) originated from several gastrointestinal and gynecological malignancies and is categorized as loco-regional disease limited to the abdominal cavity [3]. The prognosis of the PM depended on primary tumor origin and the intraabdominal tumor volume and the 3 year survival rates range from 5-10% for gastric PM to 50%-60% for ovarian PM [4].

PM are metastatic deposits on the peritoneal surface throughout the abdominal cavity. These deposits may invade abdominal organs and structures frequently causing bowel obstruction, ascites or ureteral obstruction and malignant ascites PM may arise most common from ovarian cancer in females and colorectal cancer in males [5].

Pseudomyxoma peritonei is characterized by mucinous ascites and mucinous peritoneal deposits is another rare disease which most originated from a ruptured low-grade mucocele of the appendix [6]. In conclusion PM may originate from various underlying diseases with a large variation in epidemiology, treatment strategy and prognosis.

Patients selection for CRS and HIPEC

Patients' selection for CRS plus HIPEC involves multidisciplinary team evaluating, the extent of peritoneal disease, patients' fitness and performance status and tumor key biology criteria include. Minimal disease is judged by a peritoneal cancer Index (PCI), absence of distant metastasis, good overall health, age, comorbidities and tumor-specific factors [7].

Pre-operative evaluation include CT scan, diagnostic laparoscopy and sometimes MRI are to assess the extent of the disease, but the final decision requires expert evaluation in a specialized peritoneal malignancy center.

Extent of Peritoneal Disease

Probably the most important and evident prognostic factor is the extent of peritoneal disease. Although several scoring systems exist: the peritoneal cancer Index (PCT) score is the most commonly used (Figure 1) and best validated [8].

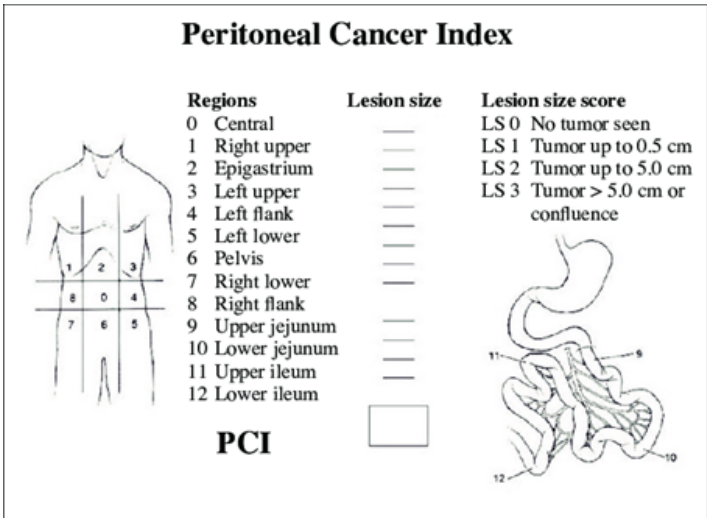

Figure 1.

Numerous large cohort studies have identified the PCI score as a major prognostic factor [9,10]. Many investigators stated that CRS and HEPEC do not seem to offer any survival benefit in patients with PCI score of ≥ 17 [11,12], furthermore a closely related factor is the extent of small bowel involvement as demonstrated by research Spiliotis et al. [13].

Unfortunately, imaging modalities such as CT scan, MRI or PET scan or combination does not adequately correlate with intraoperative PCI score so far diagnostic laparoscopy with histological confirmation remains the gold standard for quantifying PM despite its more invasive character [14,15]. Absence of disease spread beyond the abdominal cavity is another crucial criterion as HIPEC is only for peritoneal disease.

Patients Overall Health

Age and comorbidities play an important role in the selection criteria. While young patients are often selected, the decision also considers the patient's overall ability to withstand aggressive surgery and loco-regional chemotherapy regimen.

Performance status is important (e.g Karnofsky index >70) to tolerate the procedure and also another factor is the motivation and willingness to understanding and commitment to the complex treatment process are important.

Completeness of cytoreduction

The goal of the surgery is to complete remove all visible tumor deposits which is a prerequisite for successful HIPEC which is to destroy ell microscopic remain disease.

The completeness of cytoreduction score (CCs) measures the amount of macroscopically visible tumor that it seen after CRS (Figure 2).

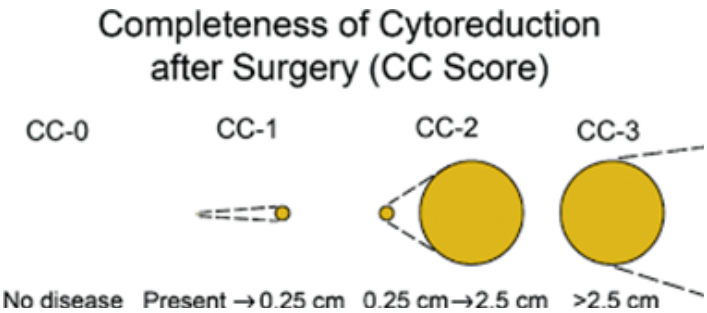

Figure 2.

This parameter is so essential that experts agree that CRS and HIPEC should be performed if complete or nearly complete (CC-0 or CC-1) cytoreduction is feasible [16].

Since the likelihood of complete cytoreduction is related to surgeon experience the procedure should be performed in high-volume specialized centers.

Institution and expertise

CRS and HIPEC should be performed by experienced teams at specialized institutions that manage peritoneal surface malignancy, the complex nature of the procedure requires a highly skilled surgical team [17] and extensive training from experienced colleagues is essential if we wish to implementing this procedure in a new center.

Discussion

Selectin patients with PM for CRS and HIPEC is a difficult task.

It is combined with a long learning curve and needs to consider a

vast number of different aspects as previously described [18].

Two of the key points is the resectability and the other is to remain low morbidity and mortality rates. Proper patients' selection helps in optimizing the procedure to achieve optimum outcome. It has also been observed that with the necessary preoperative and perioperative steps the morbidity and mortality for this treatment can be brought down as comparable to any other major abdominal surgeries.

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