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Parenteral and enteral nutritional support (excluding immunonutrition)

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Summary
The surgeon plays a key role in the perioperative nutritional care in patients undergoing elective major digestive surgery; therefore, he has to be able to anticipate needs and to implement corrective measures according to recommendations. Pre- and postoperative enteral feeding is preferred. In patients without obvious undernutrition, postoperative nutritional support has to be initiated if patients cannot maintain oral intake above 60% of recommended intake for more than 7 days, and it has to be programmed if it is anticipated that the patient will be unable to eat for more than 7 days. Preoperative and postoperative nutritional support has to be offer in malnourished patients (grades 3 and 4).

Introduction

Nutritional management during the perioperative period in gastrointestinal oncology is of major importance and involves a central role of the surgeon in screening, diagnosis and introduction of corrective measures. Many studies and meta-analyses have demonstrated the benefit of nutritional assistance before and after major gastrointestinal surgery. In this chapter we consider the indications and types of nutritional assistance available – parenteral or enteral – during the pre and postoperative period according to the guidelines from the learned societies and the expected advantages, disadvantages and benefits of each of the two types of nutrition. We will then define how to deliver nutritional support in everyday practice (approach routes, duration and patient monitoring).

For which patients and in what situation?

The surgeon occupies a key position both in screening for malnutrition preoperatively and in starting nutritional support pre- and postoperatively. He/she is also even in the position to diagnose malnutrition well before the surgery, organise nutritional intake postoperatively and insertion of the different approach routes (tubes, catheters, etc.) and refer the patient to a dietician and/or nutritionist if the patient's weight loss is over 15-20% in order to ensure optimal follow up and care. Screening and management should be started as early as the Multidisciplinary Team Meeting.

During the preoperative period, nutritional support (with enteral or parenteral nutrition) should be started for a minimum period of 7 days in any patient with cancer depending on nutritional grade (NG 2 to 4) as described in the previous chapter.

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Preoperative nutritional assistance can reduce the postoperative complication rate by 10% [1-5] and the length of hospital stay in malnourished patients [6].

Nutritional management, type of nutritional assistance and route of approach (tube, stoma, intravenous) should be planned preoperatively for the postoperative period. Just as preoperatively, postoperative nutritional assistance should not be started routinely but depending on nutritional grade, oral intake and postoperative complications. Two other important points should be highlighted. (i) post-operative nutritional assistance for under 7 days is not recommended and (ii) administration of preoperative nutritional assistance should not change the indications for nutrition during the postoperative period.

Guidelines

SFAR (Société Française d'Anesthésie Réanimation), ESPEN (European Society for Parenteral and Enteral Nutrition), ASPEN (American Society for Parenteral and Enteral Nutrition) [7-9] and the Société Française de Chirurgie Digestive [10] have produced relatively similar guidelines which are not specific to patients undergoing surgery for gastrointestinal cancer but depend on the type of gastrointestinal cancer performed (minor versus major). The guidelines for "major" surgery apply to patients undergoing surgery for gastrointestinal cancer.

Preoperatively

SFAR

The Société Française d'Anesthésie – Réanimation (SFAR) guidelines are shown below on the basis that all patients with cancer are at least nutritional grade 2:

- preoperative nutritional management with dietetic advice and nutritional supplements containing immunonutrients before cancer surgery for a minimum time of 7 days (R28 SFAR) and discussion of the possible use of postoperative nutritional assistance;
- for grade 3 patients: preoperative nutritional management with nutritional supplements or enteral or parenteral nutrition depending on oral intake (if < 20 kcal/kg/d) and planning postoperative nutritional assistance;
- for grade 4 patients: preoperative nutritional assistance (enteral or parenteral nutrition) for at least 7 to 10 days combined with immunonutrition before cancer surgery.

If nutritional assistance is indicated, enteral nutrition should be preferred in any patient with a functional gastrointestinal tract as parenteral nutrition is not indicated in this situation (R19 SFAR).

It is important to note that the same preoperative nutritional strategies apply to elderly patients although more regular nutritional monitoring is required because of their poor adaptation to malnutrition and their resistance to renutrition (R20 SFAR).

ESPEN and ASPEN

According to ESPEN and ASPEN, oral nutritional supplements containing immunonutrients given for a preoperative period of 5 to 7 days is recommended for non-malnourished patients before major surgery (grade A, ESPEN). Nutritional assistance before major surgery is recommended for a period of 10 to 14 days (grade A, ESPEN), preferably by enteral feeding (grade A, ESPEN; grade B, ASPEN); for patients at risk of severe malnutrition. The risk of malnutrition was based on the presence of at least one of the following factors: weight loss of 10 to 15% in the previous 6 months, BMI of < 18.5 kg/m^2, serum albumin of < 30g/l (without renal or hepatic impairment). ESPEN also recommends that preoperative nutritional assistance (preferably enteral) be started even in the absence of malnutrition if unassisted oral intake during the 10 days postoperative is less than 60% of nutritional requirements (grade C, ESPEN).

Postoperatively

The postoperative guidelines from the learned societies are shown below:

- Enteral refeeding (oral if possible) should be started within the first 24 hours (R27 SFAR, grade A, ESPEN; grade C, ASPEN), depending on patient tolerance and if no surgical contraindications are present (Grade C, ESPEN). ESPEN also recommends starting oral intake (with clear fluids) during the hours after colonic resection as this is possible in most patients (Grade A, ESPEN).
- For grade 2 patients (not malnourished): starting nutritional support for a minimum time of 7 days (R28 SFAR) preferably enterally, when one intake is under 60% of daily requirements for 7 days (R29 SFAR) and (ii) if predictable nutritional intake is less than 60% of daily requirements during the 7 days postoperatively (R30 SFAR). According to ESPEN, postoperative enteral nutritional support is recommended in patients undergoing surgery for gastrointestinal cancer if oral feeding cannot be started again (grade A, ESPEN 2006). Enteral tube feeding (jejunostomy or naso-jejunal tube) should be started within 24 hours after surgery (grade A, ESPEN 2006).
- For grades 3 and 4 patients (malnourished): starting nutritional support in the first 24 hours postoperatively whether or not the patients had received preoperative nutritional support (R31 SFAR, grade A, ESPEN).

The recommendations to be adopted for *a priori* postoperative nutrition in patients undergoing surgery for gastrointestinal cancer are therefore as follows:

- if preoperative malnutrition is present (GN 3 and 4);
- if patients do not start eating again to a level of at least 60% of requirements on day 7 postoperatively (GN 2).

The place of oral nutritional supplements

Oral nutritional supplements (ONS) are foods which are designed specifically to provide proteins, vitamins, minerals or other nutrients. They are intended to be taken as a supplement to and apart from usual meals. Oral nutritional supplements must never replace the patient's usual diet. Peri-operative oral supplementation is reported to reduce weight loss, the incidence of complications and the costs of colorectal surgery [11,2]. The benefit of ONS during the postoperative period alone is more difficult to establish [13]: these may help to increase natural food intake and reduce hospital stays [14]. In gastrointestinal cancer surgery ONS are reserved for patients whose nutritional intake is over 60% but is still inadequate despite correct dietetic management. ONS should never replace nutritional assistance in a malnourished patient although they may be prescribed for a short period of time pending beginning appropriate nutritional support [15].