FAST-TRACK SURGERY – A NEW CONCEPT - THE PERIOPERATIVE ANESTHETIC MANAGEMENT -

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The continuously growing pressure upon medical systems as a result of the increasing number of patients who need a surgical procedure and as a result of the economical restrains lead to the development of a new concept: *fast-track surgery.* This concept brings together different perioperative strategies which according to evidence-based medicine are useful strategies. The goal of the concept is to optimize the perioperative management of the patient in order to reduce morbidity, to enhance recovery of the patient after a surgical procedure, to reduce hospital stay and to reduce costs.

The *fast-track* concept raised medical interest and enthusiasm after a published paper which presented the results of a multimodal fast-track rehabilitation protocol in colonic surgery - the ERAS (*Early Rehabilitation After Surgery)* protocol. The authors concluded „…institution of a multimodal fast-track rehabilitation program reduced hospital stay and medical complications in a comparative, nonrandomized study in elderly high-risk patients undergoing colonic surgery" [1]. The hospital stay in the ERAS group was reduced to a mean duration of 2-3 days compared to 8-10 days in the group of conventional care.

The growing interest to this concept is reflected by the fact that a lot of studies were published, studies which apply the same strategies in different types of surgery: abdominal surgery, orthopedics, gynecology, urology, a.o. [2].

The implementation of this concept relies upon hospital policies developed and applied in all departments and services involved in the management of the surgical patients. The team approach includes a lot of medical personnel, but the main actors are the surgeon and the anesthetist, which have the most constant and direct contact with the patient.

The fast-track concept refers to all phases of perioperative care: preoperative, intraoperative and postoperative strategies.

The preoperative strategies include no fasting, no preoperative bowel preparation (at least for right colonic resection), preoperative metabolic and nutritional support and patient education.

- Patient undernutrition results in defective immunologic response, impaired wound healing and increased postoperative morbidity and mortality. Along with other well recognized causes an important factor in the development of undernutrition is in-hospital fasting and improper nutrition. Fasting is regularly recommended for the diagnostic procedures and for preoperative bowel preparation and extends upon at least several days. Improper nutrition during hospitalization is a word-wide reality. The European Council adopted a resolution in order to draw attention to the spread and consequences of this problem.
- Facing these realities medical practices regarding fasting tend to change. The „classical" over-night 6-hours fasting period is in reality usually longer (8-10 hours). It is evidence-based that long-lasting fasting results in increased volume and decreased pH of the gastric content increasing the risk for aspiration. The current recommendations include a 2-hours fasting period for elective surgery in patients without further risk for aspiration. Thus during night the patient is allowed to drink clear fluids. More than that, it is recommended that the patient drinks 150ml of a clear carbohydrate-rich drink 2 hours before the planned surgical procedure. This will increase patient comfort alleviating thirst, hunger and

anxiety as a result of endogenous opioids release decreasing the intraoperative anesthetic need. It will promote gastric empting as well, without any further increase in risk of aspiration. As a result of the carbohydrate intake the surgery-induced stress metabolism is ameliorated and postoperative insulin-resistance decreased.

- The postoperative nutrition of the patient is a matter of medical concern, but usually the preoperative nutrition is neglected. Due to lack of means or knowledge or due to restraining medical recommendations patients often decrease their oral intake beyond their usual capacities. Preoperative nutritional management includes identification of patients with or at risk for undernutrition and nutritional recommendations. Whenever possible the preferred route is the enteral one. For patients at risk for undernutrition it is useful to add to the usual food intake oral nutritional supplements (sip drinks). The malnourished patient will benefit from a preoperative nutritional support, mainly in case of cancer or major surgical procedure.
- Patient education is an integral part of medical management. It implies thorough explanations and realistic information about the medical and surgical procedures and about the realities of the postoperative period. In the absence of information delivered by the medical staff the patient will gather anecdotic data delivered by other patients according to their experiences, to their level of understanding and of copping with those realities. Patient education results in gaining patient cooperation. It will place the patient in the proper position of an important partner in the medical act. Also it will result in increased patient satisfaction and in decreased complains. Pre-admission counseling is most advisable.

The intraoperative strategies include optimized anesthesia, tranverse surgical incision, atraumatic surgical technique, avoidance of drains and tubes, optimized volume therapy, single dose antibiotic prophylaxis, maintenance of intraoperative normothermia and prophylaxis of postoperative nausea and vomiting (PONV).

- Optimized anesthesia includes all strategies to achieve proper depth of anesthesia and analgesia, avoiding too deep anesthesia and late recovery in order to minimize surgery-induced stress, but also in order to permit early extubation of the patient. Intraoperative use of epidural analgesia combined with general anesthesia will allow decreased use of opioids, will alleviate postoperative stress and will enable effective postoperative epidural analgesia.
- Intraoperative optimized volume therapy relies upon avoidance of excessive crystalloid administration by the use of colloids. Over-night permission to drink and avoidance of colonic preparation result in absence of hypovolemia at the start of the surgical procedure and result in decreased intraoperative volume replacement.
- Intraoperative hypovolemia results in intestinal malperfusion prior to the decrease of systemic blood pressure. Gut hypoperfusion will promote malfunction of the intestinal barrier with release of pro-inflammatory intestinal mediators and bacterial translocation. On the other hand, excessive crystalloid infusion will result in tissue edema, impaired tissue oxygenation and impaired tissue healing. Avoidance of intraoperative hypovolemia, but also avoidance of excessive crystalloid infusion may be achieved using a combination of crystalloids and colloids.
- The development of intraoperative hypothermia is a constant reality in all type of surgery, but it is of greater magnitude in case of thoracic or abdominal surgery. It has a lot of consequences, but the most important are impaired hemostasis with increased intra- and postoperative blood loss, delayed metabolism of anesthetic drugs with delayed recovery, increased incidence of postoperative shivering with increased oxygen consumption and increased risk of myocardial ischemia. Maintenance of intraoperative normothermia is

achieved by active warming of the patient using intraoperative hot air warming blankets which cover the nonoperated parts of the body and administration of warm intravenous fluids.

- Postoperative nausea and vomiting are frequent after general anesthesia and/or abdominal surgery. Often the patient forgets the postoperative pain, but remembers well and long the misery of nausea and vomiting. The presence of these symptoms impairs the ability to resume oral hydration. The treatment of PONV begins intraoperatively avoiding/decreasing the dose of drugs which result in PONV and administering antiemetic medication at the end of surgery.

The postoperative strategies include effective pain relief, early ambulation and early oral hydration and nutrition.

- Mistreated pain results in physiologic and psychological consequences, delayed and impaired ambulation and decreased comfort and satisfaction. Adequate pain relief relies upon use of written protocols, use of epidural analgesia and frequent pain evaluation and documentation (pain evaluation results should be written in patient's file).
- Early ambulation has a lot of well known favorable consequences. It means bed rest in the day of major surgery, but at least 6 hours out of bed during day 1 after surgery. It is possible in the presence of adequate pain relief without opioids. This strategy proved to be appropriate in case of colonic surgery and with adaptations is explored in other types of surgery.
- Early oral hydration is recommended in different types of surgery. The ERAS protocol for colonic surgery recommends no naso-gastric tube, oral fluid intake in the day of surgery more than 300ml fluids and stop of iv fluids on day 1. If necessary colloid administration is encouraged.
- Early oral nutrition means early resumption of oral intake. In ERAS protocol for colonic surgery in the day of surgery oral nutritional supplements are indicated and solid food during day 1 after surgery combined with oral supplements (sip drinks).

It is always difficult to change routine. The term is not used meaning comfort, but meaning time-proven ways of doing things. Jose Maessen from the University Hospital in Maastrichit (Netherland) presented at the ESPEN Congress in Lisbon 2004 the lecture *„Compliance with a newly introduced treatment protocol – hurdles in changing practice"*. He showed that the compliance with the newly implemented ERAS protocol was modest (only about 54% of protocol parameters being fully accomplished). He disclosed with humor the traditional thinking of surgeons (*„as long as we do not have an anastomotic leakage"),* of anesthetists *(„postoperative pain is a solved issue"),* of nurses *(„the patient was dizzy, so I left him in bed")* and of patients *(„I don't mind staying a little longer in bed").*

In conclusion it is not a simple task to implement a new protocol for the surgical patient. It needs a lot of determination, wide-spread acceptance, objectives compatible with common practice, concrete definitions of desired parameters and an easy accessible and user friendly format. But in the era of evidence-based medicine and of economical concerns we should try.

REFERENCES

1. Basse L, Thorbol JE, Lossl K, Kehlet H. Colonic Surgery With Accelerated Rehabilitation or Conventional Care. *Dis Colon Rectum.* 2004; 47(3): 271-278.
2. Wichmann MW, Roth M, Jauch KW, Bruns CJ. A prospective clinical study for multimodal „fast-track" rehabilitation in elective pancreatic cancer surgery. *Rozhl. Chir.* 2006; 85(4): 169-175.