

POST-OPERATIVE COMPLICATIONS IN RISK SURGICAL PATIENTS ADMITTED TO THE INTERMEDIATE CARE UNIT OF PORTUGUESE INSTITUTE OF ONCOLOGY, PORTO: RELEVANT INFORMATION TO PLAN A PATIENT CENTERED CARE

COMPLICAÇÕES PÓS-OPERATÓRIAS EM DOENTES CIRÚRGICOS DE RISCO INTERNADOS NA UNIDADE DE CUIDADOS INTERMÉDIOS DO INSTITUTO PORTUGUÊS DE ONCOLOGIA DO PORTO: INFORMAÇÕES RELEVANTES PARA O PLANEAMENTO DOS CUIDADOS CENTRADOS NO DOENTE

 LÚCIO LARA SANTOS^{1,2,3},  CAROLINA CASTRO¹,  FÁTIMA SANTOS^{3,4}, CARLA SALOMÉ SANTOS³, JOAQUIM REIS³, PEDRO ANTUNES²,  PEDRO CARVALHO MARTINS^{2,3}

¹ Experimental Pathology and Therapeutics Group – Portuguese Institute of Oncology, Porto, Portugal

² Surgical Oncology Department – Portuguese Institute of Oncology, Porto, Portugal

³ Surgical Intermediate Care Unit – Portuguese Institute of Oncology, Porto, Portugal

⁴ Department of Anesthesia – Portuguese Institute of Oncology, Porto, Portugal

ABSTRACT

Knowing the surgical burden and risk profile of surgical complications is mandatory to support the effective organization of perioperative care. The purpose of this work was to characterize the complication's profile of patients admitted and treated in the years 2017 and 2018 in the surgical intermediate care unit (SICU) at our institution. The clinical records of surgical patients admitted to the intermediate surgery care unit (n=2017) with a high risk of complications were retrospectively studied, considering the comorbidities and surgical complexities. In this group of patients, 832 postoperative complications occurred. Most were grade I and II according to the Clavien-Dindo classification. Respiratory, sepsis and cardiac complications were the most prevalent medical major complications. Surgical site infections, anastomosis leak and peritonitis were the most prevalent surgical complications, 2.2% of patients died in this series. These data point out the need of an organized and resourceful perioperative care program that includes a prehabilitation program, proficient intraoperative care and a multidisciplinary team in the SICU to ensure quality post-operative care, for high-risk surgical patient.

Key words: *Surgical patients at risk, surgical intermediate care unit, perioperative care.*

RESUMO

Conhecer o perfil do risco de complicações cirúrgicas é crucial para a organização eficiente dos cuidados perioperatórios. O objetivo deste trabalho foi caracterizar o perfil de complicações dos doentes internados e tratados em 2017 e 2018 na unidade de cuidados intermediários de cirurgia (UCI) de nossa instituição. Foram estudados retrospectivamente os processos clínicos de doentes cirúrgicos admitidos na UCI (n = 2017) com elevado risco de complicações, tendo em conta as comorbilidades e a complexidade cirúrgica. Nesse grupo de doentes, ocorreram 832 complicações pós-operatórias. A maioria foi de grau I e II de acordo com a classificação de Clavien-Dindo. As complicações respiratórias, sépticas e cardíacas foram as complicações médicas



mais prevalentes. As infeções do local cirúrgico, as deiscências da anastomose e as peritonites foram as complicações cirúrgicas mais frequentes. Nesta série 2,2% dos doentes faleceram. Estes dados apontam para a necessidade de um programa de cuidados perioperatórios organizado, com recursos e que inclua um programa de pré-reabilitação, cuidados intra-operatórios proficientes e uma equipe multidisciplinar na UCI para garantir que o atendimento pós-operatório ao doente cirúrgico de alto risco seja de qualidade.

Palavras-chave: Doentes cirúrgicos de risco, Unidade de cuidados intermédios de cirurgia, cuidados perioperatórios.

INTRODUCTION

Major surgery is associated with significant complication rates¹. Many of these patients have complex comorbidities, leading to a high risk of postoperative complications^{2,3}. At the Portuguese Institute of Oncology in Porto (IPO-Porto), surgical patients are assessed at the preoperative period and receive preoperative and intraoperative care by the Internal Medicine and Anaesthesiology services, respectively. However, they provide little input into their postoperative management. This critical period of the patient's surgical journey is being managed by junior members of the surgical team, senior surgeons in charge of the patient and urgency surgical team, often leading to significant variation in standard of care.

The profile of these patients was previously studied according to their surgical risk profile, and we developed an instrument, the MyIPOscore, that better predicted the complication rate in patients with co-morbidities or undergoing major complex surgeries admitted in the postoperative period in the intermediate care unit⁴. This instrument allows the identification of patients who can benefit from a prehabilitation program, improving their performance status and becoming more robust to the biological challenges that the surgery involves.

The intraoperative period is another critical moment in which the surgical volume allows the teams to be expertized, promoting better outcomes. Dramatic differences in mortality between very-low-volume and very-high-volume hospitals were observed for pancreatic resection and esophagectomy (more than 12%, in absolute

terms) in USA⁵. On the other hand, implementation of the World Health Organization Surgical Safety Checklist correlates with reduced surgical mortality and length of hospital admission in high-income countries⁶.

The immediate postoperative period is another crucial moment in controlling deviations from normality, early diagnosis, and mitigations of serious complications⁷. In an article published in JAMA in 1957, entitled "Hazards of the immediate postoperative period", Robert Dripps emphasized that the three primary causes for alarm are hypotension, respiratory obstruction or depression, and excitement⁸. In this sense, knowing the profile of complications allows to anticipate and standardize actions, procedures, and routines, ensuring proficient protocols and effective care provider teams. Therefore, a surgical outcome monitoring and improvement program (Audit) could enhance the understanding of surgical performance and helps identify areas for improvement⁹.

With this aim, we studied the complications profile of patients admitted and treated in the years 2017 and 2018 in the surgical intermediate care unit (SICU) at our institution.

MATERIALS AND METHODS

This was a retrospective and descriptive study, performed with patients admitted to the ICU from 2017 to 2018. The ICU is a level II unit. Its purpose is to monitor and treat cancer patients with moderate or potentially severe physiological instability, which require care that is not available



in common wards but does not require artificial life support from more than one organ and without the need for invasive mechanical ventilation. The unit has eight beds / units with invasive monitoring features, pulse oximetry, automatic intravenous infusion means. The systematic record of the evolution of the patient's clinical situation is carried out. The nurse / patient ratio at the ICU is 1: 2.7. Most patients admitted and treated are patients with comorbidities after elective surgeries or patients undergoing complex elective surgeries. Emergency surgeries and surgical patients with complications from the wards are also admitted. It is also the step-down unit of the intensive-care unit.

The following data was obtained from clinical records by an experienced medical outcome researcher: demographic data, comorbidities, reason for admission, dominant pathology, previous anti-cancer treatment, length of stay at the ICU, transfers to the intensive-care unit, readmissions, type, and severity of surgical complications¹⁰, and mortality.

The study was approved by the Institutional Review Board and the Ethics Committee. Waiver of informed consent from patients was approved because of the observational nature of the study.

Statistical analysis

Normal distribution of continuous variables was examined with Kolmogorov–Smirnov test. Continuous variables are presented as median (minimum and maximum) and categorical variables as frequencies and percentages. Statistical significance was considered at the level of $p < 0.05$. All statistical analysis were performed using the software SPSS version 21.

RESULTS

Two thousand and seventeen patient files were reviewed. The collected data is summarized in table 1. The median age was 65.2 years (min 19 – max 99

years), 1281 (63.5%) were men. The median length of stay at the ICU was 2.1 days (1 – 6 days). One thousand five hundred and ninety-nine patients were admitted after elective surgery (1215 due to complex surgery and 384 due to comorbidities). Twenty-four percent of patients underwent

TABLE 1 – Characteristic of the series

Characteristics		Cases (%)
Gender	Male	1281 (63.5%)
	Female	736 (36.5%)
Pathology	Digestive	770 (38.2%)
	Thoracic	281 (13.9%)
	Head and Neck	448 (22.2%)
	Others	518 (25.7%)
Pre-operative Chemotherapy	Yes	452 (22.5%)
	No	1565 (77.5%)
Comorbidities	Cardiac	135 (35.0%)
	Respiratory	39 (10.0%)
	Coagulations	7 (2.0%)
	Multiples	203 (53.0%)
Post-operative Complications	Total	832 (41.2%)
Clavien Dindo classes	I	83 (10.0%)
	II	386 (46.4%)
	IIIa	63 (7.6%)
	IIIb	166 (20.0%)
	Iva	46 (5.5%)
	IVb	43 (5.2%)
V	45 (5.4%)	
Type post-operative complications	Pulmonary	117 (14.1%)
	Sepsis	79 (9.5%)
	Cardiac	45 (5.4%)
	Cerebrovascular	10 (1.2%)
	Renal	14 (1.7%)
	Thromboembolism	8 (1.0%)
	Urinary Tract Infection	35 (4.2%)
	Metabolic	27 (3.2%)
	Other medical complications	156 (18.8%)
	Surgical site Infections	152 (18.3%)
	Anastomotic leak	43 (5.2%)
	Peritonitis	31 (3.7%)
	Fistula	25 (3%)
	Haemorrhage	59 (7.1%)
Intestinal obstruction	31 (3.7%)	



preoperative chemotherapy. Most patients had digestive pathology.

During this period that was assessed, 832 (41.2%) postoperative complications were recorded, 469 (56.3%) of which were mild (I and II) according to the Clavien-Dindo classification, 88 (4.3%) patients were transferred to the intensive-care unit, and 196 (9.7%) patients were readmitted to the ICU due to complications diagnosed after discharge from this unit. Respiratory, sepsis and cardiac complications were the most prevalent medical complications. Surgical site infections, anastomosis leak and peritonitis were the most prevalent surgical complications. Death occurred in 45 (2.2%) patients.

DISCUSSION

This study reveals that care in the immediate postoperative period in cancer patients is crucial.

We found that although most patients are not geriatric, pre-existing diseases determine a high risk of postoperative complications. Most of the patients we studied underwent major surgery. Medical complications were relevant.

Like previous studies¹, we found that postoperative burden remains unacceptably high despite all improvements with anesthesia, surgical techniques, and preoperative medical assessment. These data imply a change in the organization of perioperative care (figure 1). In fact, for the mitigation of postoperative complications to be achieved, an effective organization of a perioperative care unit must be embraced by all hospital partners involved with surgical care. The Perioperative Surgical Home (PSH), for instance, is defined by the American Society of Anesthesiologists as “a patient-centered and physician-led multidisciplinary and team-based system of coordinated care that guides the

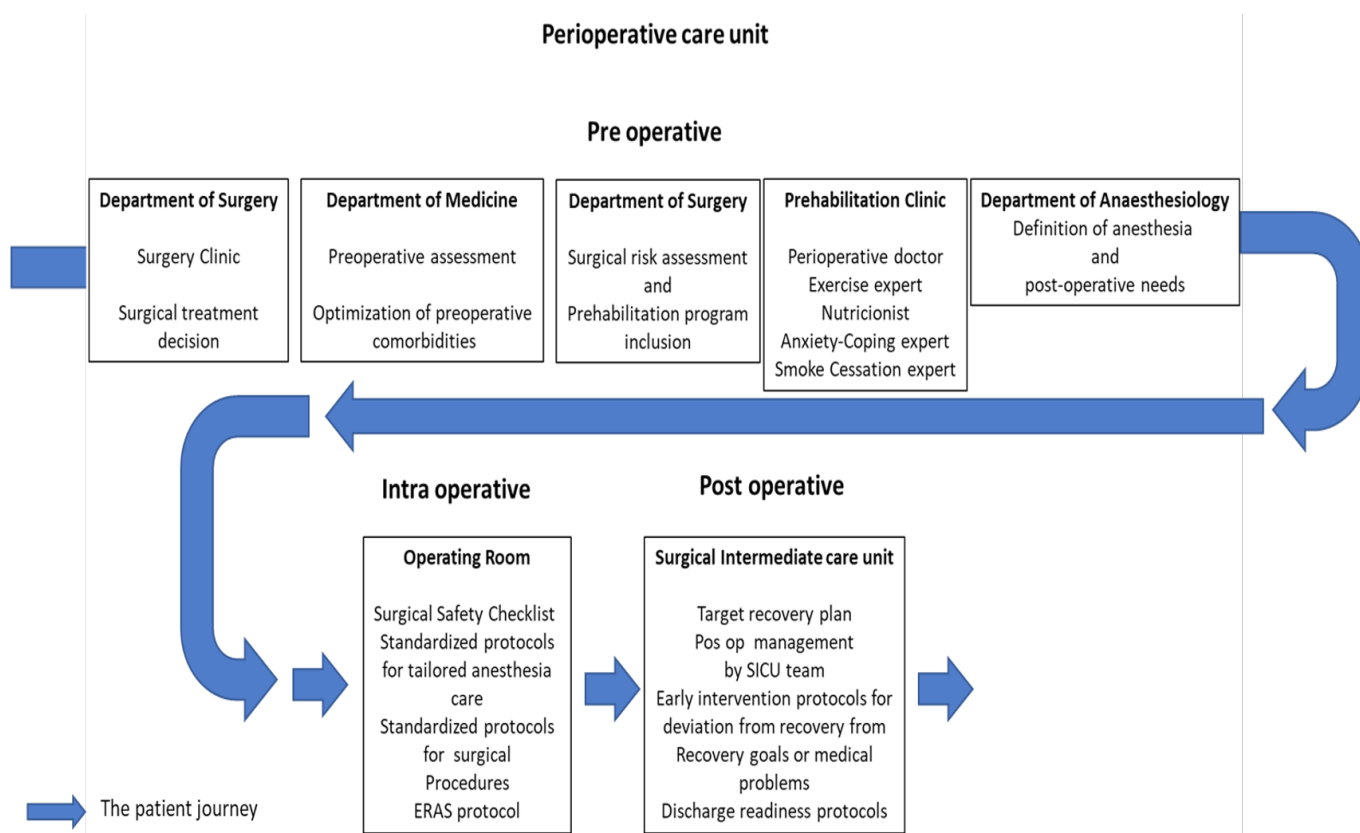


FIGURE 1 – Perioperative care network.



patient throughout the entire surgical experience”. The overall goal of the PSH is to provide improved clinical outcomes and better perioperative service at lower cost¹¹.

The surgical intermediate care unit is one of the crucial instruments in the perioperative care network. This network includes the prehabilitation unit that promotes preoperative risk assessment including identification of those patients with frailty, poor functional status, malnutrition, anxiety, and depression, and with poor medical control of risk factors like alcohol, smoking and anaemia. The early referral of these high-risk patients to specialized care is crucial and should involve medical optimization, physical exercise intervention, psychological and dietician services¹². The intraoperative care in which the safe surgery program is combined with an expert team, ensures an adequate surgical treatment with preservation of homeostasis¹³. In ICU, postoperative haemodynamic optimization protocols to guide fluid and blood pressure management using advanced cardiac monitoring equipment, early diagnosis of dysfunctions and

complications and their management, pain control and active surveillance are essential for the outcomes to be the best¹⁴. Therefore, the team at this unit needs to be a stable, multidisciplinary with skills in intensive and surgical care^{15,16}. Intermediate care units are also known as high dependency care units. The guidelines and standards for high dependency care units have been the subject of discussion, but the consensus argues that staff should have training in intensive care to have an adequate management of these types of surgical patients¹⁷.

CONCLUSION

The profile of surgical patients and their complications in the postoperative period underlines the need for the surgical intermediate care unit to actively integrate the perioperative care network. Team's profile must respond competently to the identified needs. The mitigation of perioperative complications involves the creation of multidisciplinary surgical units for perioperative care.

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Correspondência:

LÚCIO LARA SANTO

e-mail: llarasantos@gmail.com

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