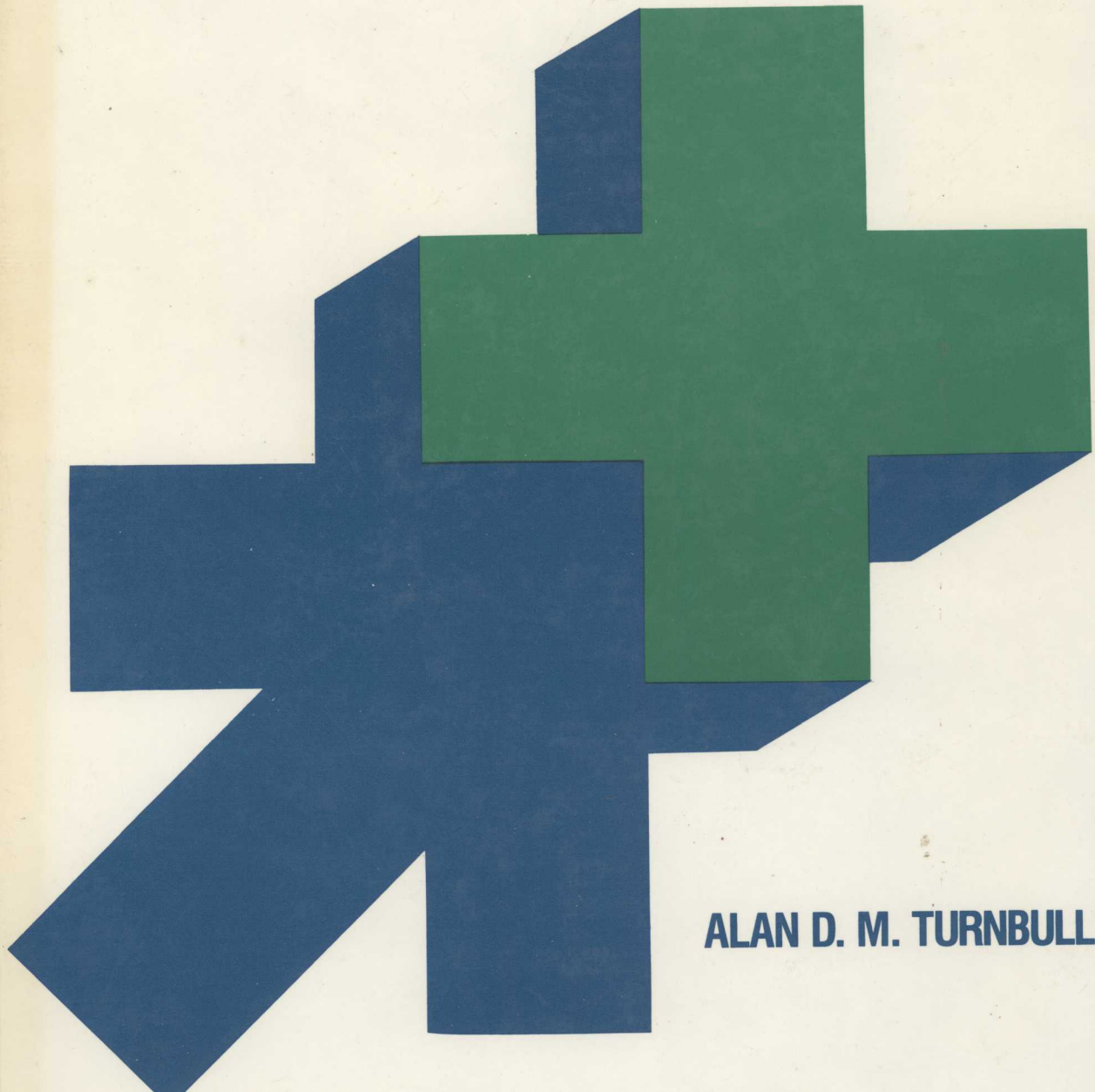
# Surgical Emergencies in the Cancer Patient



ALAN D. M. TURNBULL

# Surgical Emergencies in the Cancer Patient

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*In 1984, Memorial Sloan-Kettering Cancer Center celebrated 100 years of devotion to patient care, research, and teaching. Centennial events acknowledged contributions of founders, trustees, and staff and emphasized the center's continued commitment to the patient with cancer. In this spirit, my colleagues and I dedicate this effort to our patients and to all whose labors on their behalf make our association with this institution an honor and a privilege.*

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# FOREWORD

Cancer is both an acute and chronic disease. It may manifest as an acute illness to be managed with speed and efficacy or it may be difficult to evaluate, with a protracted natural history. Emergencies may occur in either circumstance. The proper treatment of such emergencies may permit the patient to be cured by other means or be offered significant palliative treatments. In fact, the treatment of the emergency may be the curative or palliative treatment itself. Cancer care is multidisciplinary, complex, and effective. The management of emergencies in the cancer patient is part of this continuum of care. Proper treatment requires recognition of the emergent state and understanding of both the appropriate treatment of the emergency as well as that of the disease itself. This book provides detailed information from experts in the treatment of both the emergency and the underlying malignancy. They are largely from a single cancer center that sees and treats a large number of patients. This experience has resulted in a coherent program for the management of surgical emergencies in the cancer patient.

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# PREFACE

Serious and potentially life-threatening emergencies requiring urgent and informed surgical consultation may arise at any time during the natural history of a malignant disease. Superior vena caval obstruction can be the first sign of a treatable lymphoma involving the mediastinum or a manifestation of far-advanced carcinoma of the lung. Diffuse histiocytic lymphoma involving the mesentery and adjacent small intestine can perforate during chemotherapy, often at a time when neutrophil and platelet counts are markedly depressed. Malignant melanoma, quiescent for years after what was presumed a curative resection, has announced its recurrence with intussusception or perforation of the small intestine, seizures, or signs of spinal cord compression. After effective therapy has been exhausted, a patient's final days may be complicated by obstructive uropathy, impending paraplegia, obstruction from carcinomatosis, gastric bleeding, or respiratory failure.

Each scenario demands thoughtful intervention based on knowledge of the histologic diagnosis, stage of disease, prior therapy, and potential for cure or worthwhile palliation. Finally, it must be remembered that some emergencies have causes other than the cancer or its treatment and must never be assumed to be related without confirmation.

As a surgeon with an interest in critical care medicine, I have been privileged to work at Memorial Sloan-Kettering Cancer Center among colleagues from many disciplines whose years of experience and expertise represent a wealth of practical and useful information. These physicians and surgeons agreed to contribute to publications addressing separate but related areas of interest, the first covering the pathophysiology and management of oncologic emergencies as seen in our critical care unit. This effort was published by Year Book Medical Publishers in 1984 under the title *Critical Care of the Cancer Patient,* edited by Drs. William S. Howland and Graziano C. Carlon of the Department of Critical Care Medicine.

Envisioned as a companion volume, this text, written primarily by surgeons, is based on a retrospective analysis of emergency procedures performed over a recent 5-year period. Rather than attempting to be encyclopedic, the authors have emphasized those basic principles that have guided their care of the more common problems and can be extrapolated to deal with the unexpected and unusual. Topics of general surgical inter-

est that are well-covered in standard texts have been minimized or omitted. Contributions from essential support services include those from anesthesiology, diagnostic and interventional radiology, nuclear medicine, chemotherapy, and infectious disease.

There is no doubt that caring for the cancer patient is demanding of human and economic resources. Some writers have suggested that emergency surgery in the setting of advanced disease and chemotherapy is rarely successful and only at great cost to all concerned. Unfortunately, statistically significant indices capable of predicting "worthwhile" survival are easier to write about than derive. In reality, basic clinical judgment, appropriate optimism, and a compassionate relationship with patient and family will guide all concerned to a treatment plan that is in the best interests of the patient.

ALAN D. M. TURNBULL, M.D.

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When a completed manuscript is finally ready to be forwarded to the publisher, sighs of relief abound, serving to remind the editor that acknowledgments and expressions of appreciation are due and much deserved. James Recabaren, M.D., a former fellow in surgical oncology, collated the emergency procedures done by all services during the 5-year period of study. Michelle Gerwin, now a fourth-year medical student at Cornell University, graciously gave of her valuable vacation time to retrieve and analyze data on abdominal emergencies. I am indebted to both. To my contributors who took the time to research their topics and write of their experiences, to their secretaries who typed each chapter, and to my secretaries Cathy Choumane and Harriet Fells, who put it all together, my sincere thanks! A final note of gratitude is due Daniel J. Doody of Year Book Medical Publishers, who provided the opportunity, support, and encouragement needed to allow this challenge to become a reality.

ALAN D. M. TURNBULL, M.D.

# CONTENTS

PART ONE

# General Considerations

# 1 Preoperative Evaluation of the Cancer Patient for Emergency Surgery*

William S. Howland, M.D.

Rational preoperative evaluation of the cancer patient who requires emergency surgery demands a thorough understanding of the cancer, any concurrent therapy, or coexisting disease. Surgery required during hospitalization for other reasons usually implies additional risk. Most anesthesia departments assess risk factors by using a form that experience has shown supplies the data base necessary for patient evaluation. The anesthetic evaluation form used at MSKCC is shown in Figure 1–1. When completed, this form serves as both a medical and a medical-legal record of assessment of preoperative evaluation. It is of more than historical interest that evaluation of risk factors is based on classification devised by Saklad in 1941.[2] The term "operative risk" was not used in his original classification, which was primarily a description of the patient's preoperative physical status. The reader will note that the anesthesia record used in this institution still lists physical status rather than risk. The original classification of Saklad contained six classes. The first four classes depicted none, definite, severe, and extreme "systemic disturbance." Classes 5 and 6 were for good and poor status and were used for emergency procedures. Eventually, class 7 was added to denote a patient expected to die in 24 hours with or without surgery. This system continues in use to this date and, when reexamined by Owens in 1978, was found to be workable but lacking in "scientific definition."[3] Other published classifications have dealt principally with assessment of the patient with cardiac disease undergoing noncardiac surgery.

Elective major surgery in patients more than 70 years of age is known to be associated with a higher morbidity and mortality. In addition to the systemic effects of their cancer and its treatment, elderly patients are at risk because of a basic decline in organ function and an increased prevalence of concomitant diseases. Multiple diseases involving every organ system are the rule in elderly patients.[4] Those that best correlate with increased risk are underlying heart disease, dementia, and diabetes mellitus.[5] The risk of surgery is markedly increased in the elderly if an emergency procedure is required.[6–8] The value of the American Society of Anesthesiologists (ASA) rating system was shown in a study of 500 patients more than 80 years of age in which 1 of 87 ASA class II patients and 14 of 56 ASA class IV patients died in the perioperative period.[9] In a study of gastrointestinal (GI) surgery in patients over 70

*The topics summarized in this chapter are covered in considerable detail in the companion text from the Department of Critical Care Medicine of this institution (*Critical Care of the Cancer Patient*).[1]

Age _____ Temp._____ WBC_____ Last Food Intake_____ Preop. Med.: _____

Sex _____ Pulse _____ HGB/HCT _____ Physical Status_____

Height _____ BP _____ Platl._____ Consent _____

Weight _____ Resp. _____ PT/PTT_____ Urine _____ Sat. Time:_____ Unsat.

Preop DX _____

Postop DX _____

**Preop Evaluation**

| **Cardiovascular** | | **EKG** | | **Biochem. Profile** | | **Metabolic** | |
|---|---|---|---|---|---|---|---|
| ASHD | Arrhythmia: | Normal | ST.T Seg. | K | Phos. | Obesity | Renal Ins. |
| Hyperten. | _____ | Rate | _____°H. | Na | Alb. | Wt. Loss | Adrenal Ins. |
| Angina | Per.Vasc.Dis. | NSR | Block | Cl | Bilir. | Vomiting | Bowel Prep. |
| Myo Infarct | Pericard. Eff. | Sin. Tach | | $Co_2$ | Alk. Phos. | Diarrhea | PPN/TPN |
| Date: _____ | C.V.A. | Sin. Brad. | LBBB/RBBB | BUN | GOT | Int. Obstr. | Alcohol |
| Cong. Fail | | A. Fib/Flutter | | Creat. | LDH | Diabetes | |
| Valvul. Dis. | | APC/JPC/VPC | | Ca | Gluc. | Hepatitis | |
| **Respiratory** | | **X-Ray** | | **ABG & Pulm. Funct.** | | **Therapy** | |
| URI/Cough | Tracheostomy | | | _____ $FiO_2$ | VC | Cortic. | Chemorx |
| Hoarseness | Laryngectomy | | | _____ t° | $FEV_1$ | Thyroid | |
| Bronchitis | Pleural Eff. | | | pH | $FEV_3$ | Insul. Oral. | |
| Dyspnea | Hiatus Hernia | | | $pCO_2$ | | Digitalis | |
| C.O.P.D. | Smoker | | | $CO_2$ | | Nitroglyc | |
| Asthma | | | | $pO_2$ | | Anti. coag. | |
| | | | | Sat | | Radiorx | |

**FIG 1–1.**

years of age, Greenburg et al. found an operative mortality of 20% for emergency operations and only 6.7% for elective procedures.[10] Death was usually related to an acute process complicating a treatable disease such as sepsis, myocardial infarction (MI), or respiratory failure. An observation that may assume greater significance in the future as immune monitoring becomes more common is that elderly patients in the postoperative period have depressed cytotoxic, helper, and suppressor T-cell populations and decreased cutaneous responses to phytohemagglutinin P and concanavalin A.[11] Although the exact significance of this study is difficult to evaluate, increased morbidity was associated with decreased immunocompetence, a characteristic of many cancer patients.

## CARDIAC RISK FACTORS

There have been many recent articles evaluating those factors that contribute to operative morbidity and mortality in the patient with cardiac disease undergoing elective noncardiac surgery. One of the leaders in this area is Goldman,[12] who devised a multifactorial check list that assesses the following risk factors:

1. $S_3$ Gallop
2. Myocardial infarction within 6 months
3. Premature ventricular beats more than 5/minute
4. Rhythm other than sinus
5. Age more than 70 years

6. Emergency operation

7. Intrathoracic, intraperitoneal, or aortic surgery

8. Significant aortic valve stenosis

9. Poor general medical condition

Goldman assigned a weighted value to these factors and uses them to assess operative risk. It is interesting to note that he found no risk associated with an old MI, stable angina, moderate hypertension, or smoking. Steen et al. found a reinfarction rate of 6.1%, with a mortality rate of 69%.[13] The reinfarction rate was higher if surgery took place within 6 months of the previous infarction. In this study, risk factors included hypertension, hypotensive episodes, intrathoracic and upper abdominal operations, and duration of anesthesia.

A comparison of Goldman's cardiac risk index (CRI) to the ASA physical status scoring system has been done by Waters et al., who found the ASA classification to be better in predicting morbidity and mortality.[14] Tinker believes that we still do not have a numerically validated prediction of risk for patients with documented coronary artery disease (CAD).[15]

Many anesthesiologists base much of their cardiovascular assessment on the preoperative electrocardiogram, which can be misleading. Significant CAD can exist without angina or an abnormal ECG.[16] If there are such risk factors present as age, obesity, prior MI, or smoking history, the patient should be considered to have CAD even though documentation is absent.

The question of whether cardiovascular drugs should be continued through the operative period has not been satisfactorily resolved. Nitrate preparations, beta blockers, and calcium channel blockers should be continued to the time of surgery. Nitroglycerin patches can be used during and immediately after the procedure. Antihypertensives, including clonidine, should be given. Most cardiologists believe digoxin should not be given before surgery unless it is given to slow the ventricular rate in atrial fibrillation. The vagolysis that occurs with anesthetic agents such as pancuronium can result in rapid atrial fibrillation in patients who are underdigitalized. If digitalization is indicated, it should be completed before surgery. If a sudden atrial arrhythmia is a concern, 5 mg of verapamil given intravenously is usually effective.

## EFFECTS OF SMOKING

Patients with thoracic and head and neck cancer often have heavy smoking histories. The anesthesiologist must accept the fact that most of these patients will continue to smoke and that for emergency operations no period of improvement through abstinence is possible. The principal consequences of heavy smoking are increased carbon monoxide (CO) levels and the cardiovascular effects of nicotine.[17]

Endogenous CO from hemoglobin metabolism and atmospheric pollution accounts for a CO level up to 2.5%. Heavy smokers have carboxyhemoglobin (COHb) levels from 3% to 15%.[18] Carboxyhemoglobin results in decreased levels of reduced hemoglobin for combination with oxygen, an absolute decrease in arterial oxygen content, and a shift of the oxygen dissociation curve to the left. The main response to tissue hypoxia produced by COHb is increased tissue oxygen extraction and a lower mixed venous $PO_2$. The myocardium, because of its normally high oxygen extraction, is particularly sensitive to even low levels of COHb.[19] Carbon monoxide produces a negative inotropic effect on the heart by binding to cytochrome oxidase a, $a_3$, and myoglobin, interfering with mitochon-