

# Extreme Hepatic Surgery and Other Strategies

Increasing Resectability in  
Colorectal Liver Metastases

Eduardo de Santibañes

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*Editors*



Springer

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Liver Metastases

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*To my mentors,  
Enrique Marcelo Beveraggi,  
Thomas E. Starzl,  
V́ctor Ṕrez,  
and Henri Bismuth,  
with great gratitude.*

*And to all my trainees,  
for sharing their passion with me.*

*Eduardo de Santibañes*

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## Foreword

Liver surgery is always improving, and I wonder when it will stop. Probably never.

At the beginning, the liver was considered a bloody pouch that was too risky to operate on or even to get in. The first real changes occurred in the 1950s, and included the anatomy of Couinaud bringing a real road-map of the liver and the first true anatomical liver resection by Lortat Jacob. Then, until the early 1980s almost nothing happened. The real revolution was the first imaging technique of the liver, ultrasound, which for the first time made it possible to see inside the liver in vivo; at last, smaller tumors amenable to surgical treatment could be discovered. Now, the surgeon was able to use the segmental anatomy of Couinaud. This was soon followed by intraoperative ultrasound, now allowing the surgeon to use the anatomical map of the liver segments during surgery. All these advances permitted the description of a wide variety of anatomical liver resections from subsegmentectomies to extended hepatectomies. At the same time, different ways of clamping the liver vessels were developed for the best control of intraoperative bleeding, the first fear of the surgeon. During these two decades, liver surgery achieved its full development. According to the nature of the tumor, the size and number of nodules, and the quality of the parenchyma, the surgeon was now able to choose in the vast armamentarium of techniques the most suitable for the operable patient.

But there were limitations: too large or too numerous tumors to remove, or too small liver remnants could not be overcome. We entered a new area, with the objectives of changing the tumor and/or to changing the liver. Changing the tumor included chemoembolization for hepatocellular carcinoma, and more importantly in the Western world, the use of chemotherapy for colorectal metastases. Unresectable tumors were downsized to become operable, and in 1996, we introduced the concept of “resection of unresectable liver metastases”: at the ASCO meeting in the same year, there were no communications on liver metastasis. On the other hand, changing the liver occurred with the use of portal vein embolization, which was able to increase volume of the future liver remnant to allow large or staged liver resections. The field of neoadjuvant therapies prior to liver resection was born, and opened a large avenue of research. These new concepts added to pure technical strategies that dealt with the tumoral load and the liver volume. This is the theme of this book: how to go to the extreme of our capabilities to treat the patient with this multiform spectrum of colorectal liver metastasis.

I have known Eduardo de Santibañes for more than 20 years. At the beginning, it was through Miguel Ciardullo, who trained with me at Paul Brousse in the mid-eighties before joining Eduardo. Then Eduardo and I became personal friends, and I admire his skills and leadership. Eduardo is surely one of the best expert liver surgeons in the world. He has brought together several other experts to produce this outstanding book that I think any liver surgeon will want to read in order to know what we may achieve today in the most difficult and extreme liver surgery.



Paris, France

Henri Bismuth

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## Preface

Colorectal carcinoma is the third most commonly diagnosed cancer in the world. Over 1.2 million patients are diagnosed each year, and more than half of these patients develop liver metastases during the course of their disease. Despite the several advances in the systemic treatments for these patients, radical surgery still plays the major role, as complete tumor removal offers the possibility of cure or transforms patients with an acute illness into patients with a chronic disease and a reasonable quality of life. Nonetheless, the emergence of highly effective modern chemotherapy has made it possible to rescue patients who once could not undergo surgical treatment, and has contributed to the modification of the paradigms regarding safe resection margins. Nowadays, surgical resection with curative intent is being offered to a greater amount of patients thanks to multimodal therapies that brief decades ago we would not have dreamed possible.

The field of liver surgery has experienced an exponential growth over the past 15 years, mainly owing to the introduction of more effective cancer drugs, improvements of imaging modalities, novel techniques of liver function evaluation, and improvements in anesthesia and intensive care, as well as several advances of the surgical technique itself. Over time, liver surgeons have been constantly pushing the frontiers of resectability by the introduction of several surgical innovations, but also by using diverse strategies to either increase the amount of liver to remain after resection and/or reduce the tumor size. The combination of systemic treatments, endovascular procedures, and local ablation therapies with surgery has led to the successful treatment of patients having high tumor loads and otherwise poor prognosis. From an oncological perspective, the increased knowledge concerning tumor biology and the evolution of the concept of resectability have also played key roles in maximizing the survival benefit of patients with colorectal liver metastases. The concept of resectability has changed over time, and is highly dependent on the physician's expertise. Nowadays, there is consensus that resectability should be judged by a multidisciplinary board in a case-by-case fashion, in specialized centers, and taking into account a risk/benefit perspective, the technical feasibility of achieving complete tumor resection, and the oncological rationality behind the approach.

In the present book, we aim to portray the multimodal management of patients with colorectal liver metastases, and to describe in full range the state-of-the-art surgical techniques and adjunct therapies that form the armamentarium for increasing resectability of patients with advanced disease. The



various strategies available are presented and illustrated, emphasizing the current trends and main advancements in each particular field.

This book would not have been produced without the invaluable contribution of worldwide leading experts from Argentina, Belgium, France, Germany, Italy, Japan, Netherlands, Norway, Pakistan, Spain, Switzerland, and the United States. Each of the authors of the different chapters have outstanding knowledge in the field, and have been pioneers in the development of the different strategies addressed in this book. I want to express my gratitude to these authors for their time and effort in writing informative, insightful, and up-to-date chapters. Finally, I would also like to thank the other editors, Victoria Ardiles, Fernando Alvarez, Virginia Cano Busnelli, and Martin de Santibañes, for their enthusiasm and remarkable dedication in the edition of this book.

I am convinced that the present book will be useful not only for junior and senior specialists in liver surgery who are frequently faced with clinical dilemmas of how best to care for a patient with advanced forms of colorectal liver metastases, but also for general surgeons who might be asked for an opinion, and even for general practitioners patientwho need to be aware of recent advances in order to implement a timely and accurate referral of the patient.



Buenos Aires, Argentina

Eduardo de Santibañes, MD, PhD

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