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Bernard Launois and Glyn G. Jamieson

The Posterior Intrahepatic Approach in Liver Surgery



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The Posterior Intrahepatic Approach in Liver Surgery

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To Elizabeth and Claudine

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Foreword

FOREWORD

by **Thomas E. Starzl, MD, PhD, FACS**

(Reprinted from the first edition of this book, *Modern Techniques of Liver Surgery*)

This remarkable book reflects the experience in hepatic and biliary surgery compiled at the University of Rennes by Professor Bernard Launois over nearly a quarter of a century. Although Launois was a Rennes student as a young man, most of his time between the ages of 20 and 40 years, was spent in centres in Paris, Geneva and Denver, where new techniques of hepatobiliary surgery, particularly involving liver resection and transplantation, were being developed.

Launois contributed personally to these advances at the time. Later, when he returned to the busy life of a general surgeon and to a surgical professorship in Rennes, it was not surprising that he directed his particular attention to the liver and bile ducts. Then, in 1990, Launois was joined by a younger colleague, Glyn Jamieson, on sabbatical from Adelaide, Australia. Astounded by the wealth of material and the advanced technical achievements that he had found, Jamieson concluded that these should be documented.

The book with two authors is the result. It is more than just a compendium of standard 'how to do it' liver surgery. Many of the operative procedures and management policies, including those of transplantation, are still in evolution and always at an unusually advanced state in Rennes. However, the most unique feature of the book is the description of the 'posterior approach' to individually remove Couinaud's segments of the liver in such conditions as colorectal metastases in the normal liver, and hepatocellular cancer in the organ with hepatic cirrhosis.

Claude Couinaud had pointed out long ago the value of 'extravaloean' (Glissonian) dissection for hepatic resection procedures. Consequently, for some years French surgeons have opened the main fissure of the liver in order to approach the Glissonian sheaths (contains the portal vein, hepatic artery, and bile duct branches) within the liver substance.

The authors have shown us how this can be achieved without extensive initial dissection by combining the frontal approach of Couinaud with dissection immediately behind the porta hepatis. Building on Couinaud's studies of intrahepatic anatomy and their own cadaver dissections as well as their experience in operated liver patients, they now have provided a fully documented record of this important work. It will be of great value for those who follow in their footsteps.

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1993

FOREWORD

by **Leslie H. Blumgart, MD, FACS, FRCS**

Liver resection is, in many respects, an exercise in the practical application of an understanding of the detailed anatomy of the liver. Early anatomic studies of the liver and its intrahepatic architecture were initially carried out by Rex (1888)¹ and, ten years later, by Cantlie (1897).² These studies established the lobar and segmental structure of the liver and the Glissonian sheaths. These sheaths, comprised of fibrous tissue, enclose the portal vein, hepatic artery and the biliary ducts as they enter the liver as they branch within its substance, forming the portal pedicles of supply to the lobes and sub-lobar elements of the liver parenchyma. Rex and Cantlie also delineated the planes within the parenchyma of the organ, which were relatively devoid of major blood vessels and bile ducts. These descriptions would ultimately make controlled hepatic resection possible.

Surgeons learned to fear the liver's friability and capacity for bleeding and its propensity for biliary leakage after operation. Elliot (1897)³ wrote that the liver "is so friable, so full of gaping vessels, and so evidently incapable of being sutured that it seemed impossible to successfully manage large wounds of its substance." However, Kousnetzoff and Pensky (1896)⁴ reported passing ligatures in the liver substance at a sufficient distance from the margins of the wounds to make certain that they would not slip and that, by pulling these up tightly, it was possible to allow them to cut into the liver parenchyma and compress the blood vessels. Garré (1907),⁵ in writing about surgical approaches for parenchymal transection of the liver and the arrest of bleeding during operations on the liver, pays immediate respect to Kousnetzoff and Pensky's work in which they had essentially shown that the vessels in human liver are no less resistant than arteries and veins of similar caliber in other parts of the body and are suitable for ligature. These basic techniques for suture of the liver substance and ligation of vessels as a means of controlling hemorrhage have persisted to modern times and find recent application, as described in this book, in the control of the liver pedicles within the parenchyma during liver resection.

All techniques of hepatic resection have in common the control of the inflowing hepatic arterial and portal blood vessels and of the biliary tributaries and control of the issuing hepatic veins. The most commonly used techniques for inflow control comprise extrahepatic dissection of the relevant structures within the hilus of the liver. However, the alternative approach—opening the parenchyma to control portal pedicles—has also been used extensively. Couinaud (1954), whose studies in liver anatomy are now the most frequently applied to liver resection, had described approaches to control of the pedicles of the liver.⁶⁻⁸ Ton That Tung (1979)⁹ described techniques for parenchymal dissection with control of blood vessels within its substance as they were encountered. Takasaki and his colleagues subsequently described the major Glissonian sheaths at the hilus of the liver¹⁰ and developed hepatectomy by initial ligation of the Glissonian pedicles.¹¹⁻¹²

This book is testament to the approach of Professor Glyn Jamieson of Adelaide, Australia and Professor Bernard Launois of Rennes, France and their appreciation of the pedicles of the liver and adaptation of a posterior intrahepatic approach to these pedicles for hepatectomy or segmental hepatectomy. Their description has demonstrated and

popularized pedicular control during hepatectomy and described new techniques for this approach.¹³ The technique has many advantages: being rapid and achievable with little blood loss and allowing not only control of bleeding and biliary leakage, but, by initially clamping pedicles, allowing definition of the parenchymal territory supplied by those pedicles and thus a clear index of the line of incisions into the parenchyma. The technique has been used not only for liver resection, but for isolation of the pedicles for the intrahepatic exposure of the bile ducts in the management of benign and malignant biliary strictures.

Shortly after Professor Launois brought this approach to my attention, I began using it during the tenure of my post at the University of Bern, Inselspital, Switzerland. The described technique of Launois and Jamieson has also been part of the armamentarium of my program at Memorial Sloan-Kettering Cancer Center, New York, since 1991. I, together with my colleagues in Bern and New York, have utilized this approach in approximately 500 liver resections in patients in whom it was possible to approach the pedicles without compromising resection margins in patients with tumor. This technique has been used to help achieve the results that we have reported in multiple publications concerning the resection of liver tumors and remains a major important approach.¹⁴⁻¹⁷ Almost all the use of this posterior approach has been limited to the pedicles of the right liver, as we prefer direct extrahepatic dissection for left-sided resections. However, we have employed pedicle control for resection of Couinaud segments II and III of the left liver.

The technique has proved of value in right hepatectomy and I have found it of particular value in extended left hepatectomy or posterior sectorectomy on the right. The line of demarcation between the posterior and anterior sectors of the right liver is difficult to define and somewhat variable. There is no doubt that control of the pedicles at the hilus greatly facilitates the dissection of this plane, whether it be with preservation of segments VI and VII or during extended left hepatectomy.

Professors Launois and Jamieson describe the relevant anatomy, their technique, and their results in this book. There is no doubt as to the value of this contribution in our approach to hepatic resection and they are to be congratulated on producing this clear and concise description atlas of a novel surgical technique.

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PREFACE

In 1990 for a Post-graduate Seminar on Liver Tumours, it was decided to make an innovative film on liver surgery. Because it was time-consuming to use the anterior approach or the intrafascial approach (extrahepatically), I decided to dissect straight away the Glissonian sheaths. It was immediately apparent that it was necessary to open the dorsal fissure, which has been described by Claude Couinaud in 1957 in his book: *The Liver: Anatomical and Surgical Studies*. Similarly, Claude Couinaud described the anterior approach through the main fissure in order to reach the confluence of the Glissonian sheaths. Because, my approach was the confluence of the main sheaths through the dorsal fissure other than the main fissure, it appeared to me that the correct terminology, to differentiate it from the anterior approach through the main fissure, was to call it the posterior approach. Some confusion occurred with other manoeuvres with the same objectives but all were actually different.

In 1986, in Japanese and in 1990 in English, Takasaki published a blind manoeuvre in which he passed a tape around the right main sheath through two small one cm incisions made to the right of the hepatic hilum. This made it possible to exteriorise the sheaths. He compared this manoeuvre on the right side to the extrafascial approach described by Couinaud for the left side. In 1994, Frank Lazorthes suggested taking down the hilar plate in order to reveal the right medial pedicle and then clamp it to show the main fissure and the right fissure. He called his approach the suprahilar approach. This approach is very limited and all the manoeuvres above the portal confluence are in fact suprahilar. Indeed, that approach was described for the first right extended hepatectomy by J.L. Lortat-Jacob in 1954. For clarity, it is useful to go back to C. Couinaud's classical book of 1957 where he described three approaches: intrafascial (extrahepatic) (J.L. Lortat-Jacob), extrafascial (Couinaud and Takasaki) and transfissural (anterior and posterior).

In our hands, the posterior approach brought to us many advantages: comfort, safety, saving time. Glyn Jamieson, who spent a year with me at this time, suggested writing a book documenting the posterior approach and this led to the publication of *Modern Techniques of Liver Surgery*. The majority of the drawings were designed by him. This new book has provided us with an opportunity to reflect on the application of this technique. Many innovative steps were recorded in the original book for the first time and many were subsequently adopted by other surgeons: the description of the free space in front of the vena cava (which is the first step of the hanging manoeuvre), the primary approach to the right pedicle with no mobilization of the liver, the recognition of the right medial pedicle for a left extended hepatectomy, the isolation of the right lateral pedicle (when there is no Rouvière fissure), right sectorectomies and segmentectomies of the right liver. Finally, we showed that the hilar plate is not a plate but a half-cylinder. In 1993, when the posterior approach was published and developed in *Modern Operative Techniques in Liver Surgery*, it was a newborn technique. Today it has reached its majority. Unfortunately, the first book sold out quickly and it is now difficult to obtain. It is time to revisit the State of Art of the technique. New developments have occurred, such as the hanging manoeuvre and of course laparoscopic procedures. The objective of *The Posterior Intrahepatic Approach in Liver Surgery* is to further describe these techniques, as the more routine

application today of split liver, living donor transplantation has continued to teach us more about the anatomy of the liver and its applications. Furthermore, since our first book, laparoscopic surgery in general has grown space and it is important to show the application of the posterior approach in laparoscopic liver surgery as well.

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