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Liver Disease in Children

**An Atlas of Angiography and
Cholangiography**

With 181 Figures

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Cover illustrations. Halftone: Caroli's Disease. Percutaneous cholangiography shows multiple cystic dilations of the intrahepatic bile ducts. *Line drawings:* Ch. 2, Fig. 1. Normal anatomy and variations.

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Foreword

In recent years, developments in ultrasound, computed tomography and magnetic resonance imaging have made important changes in the practice of diagnostic radiology. Concomitantly, invasive radiology for both diagnostic and therapeutic purposes has grown into a rapidly evolving subspecialty.

This text represents a landmark in paediatric radiology. The three authors are distinguished radiologists who, over the past two decades, have greatly contributed to paediatric hepatology. Their pioneering work in the area of splanchnic angiography and diagnostic as well as therapeutic cholangiography was facilitated by their close day-to-day interaction with the Paediatric Liver Disease Unit at Hôpital Bicêtre. The contents and the format of this "atlas" are testimony to their knowledge of clinical hepatology and to their wide experience in invasive paediatric radiology. The outstanding quality of the images is enhanced by appropriate clinical descriptions which will help the reader understand the indications for these procedures, their accuracy and limitations.

Although non-invasive organ imaging has reduced the need for diagnostic angiography in diseases of the liver, pancreas and retroperitoneum, selective angiography still has an important place for vascular lesions, tumours, and portal hypertension. It remains a necessary complement to non-invasive imaging before and during interventional procedures such as liver transplantation. If percutaneous cholangiography has become a primary radiological procedure in paediatric hepatology, it is largely due to the innovative work of Doctors Chaumont, Brunelle and Pariente. They have truly shown the way to the rest of the world by stressing the value of the procedure as well as its relative simplicity and speed.

We are deeply grateful to the authors for this exceptional collection of clinical and radiological data which constitutes a wonderful tribute to their clinical skills, timeless efforts and dedication to the welfare of children with hepatobiliary diseases.

C. Roy
D. Alagille

Preface

This book presents all the aspects of angiography and cholangiography in liver diseases in children. It represents more than 20 years' experience (1969–1993). During this period the techniques have evolved. Splenoportography was largely used during the initial years, then cut films arteriographies and now DSA.

The technical aspects of angiography are fully described – the need to use small catheters and heparin to reduce the number of complications is emphasised.

Anaesthetic aspects and special problems in patients with liver diseases are mentioned as appropriate.

We have stressed normal anatomy and variations as a basis for analysing pathological features.

We have described in detail the venous anatomy of the pancreas to allow percutaneous venous samplings in hyperinsulinism.

The wide experience of our radiological team in the field of portal hypertension in children should make Chapter 3 a valuable tool for any radiologist involved in the pre- and postoperative work-up of these patients. Ultrasonographers will find in our illustrations clues to an accurate and rapid assessment of this condition.

Many rare diseases, such as congenital hepatic fibrosis, are fully described and illustrated. Original and previously unpublished data are presented in the difficult area of liver angiomas. As treatment differs according to the precise type of angioma, accurate and detailed diagnosis is mandatory. An algorithm is given for an optimal diagnostic approach.

Such a clinicoradiological approach is also used for hepatomas, adenomas and other rare tumours.

In the difficult area of bile duct disease our wide experience of percutaneous opacifications allows us to give a precise anatomical description of intrahepatic bile duct involvement in biliary atresia and of intrahepatic lymphatics in chronic biliary cirrhosis. Sclerosing cholangitis is described.

The functional anatomy of choledochal cysts is given.

The increased number of liver transplantations in children is taken account of in Chapter 7 which is dedicated to this difficult area. Angiography and percutaneous diagnostic as well as therapeutic procedures are discussed.

In addition to diagnostic angiography we present an extensive description of interventional procedures.

The vascular radiological anatomy of liver disease provides an essential basis for a detailed understanding of new imaging methods such as magnetic resonance imaging and Doppler ultrasound.

Acknowledgements

All this work was done in very close collaboration with the Paediatric Hepatology Department created and directed by Professor Daniel Alagille. Their clinical and scientific work served as a base for our radiological studies.

Our secretaries, Marie-Lise, Sylvie, Fabienne, Nathalie and Dominique deserve our deep thanks. Their work starts when ours finishes. Their efficient management of patients' files was a great assistance in our work.

Our technicians participated in every single examination. They were indispensable and appreciated companions. We owe to them the quality of our films. They helped us by their continuing advice and remarks.

Anaesthesiologists and their nurses worked in close collaboration with us. It is thanks to their skills that we could achieve good quality examinations in complete security. They are too numerous all to be listed; they are keenly aware of our friendship.

During 25 years, many radiologists contributed to the realisation of angiographies. Among the members of the medical team of the Bicêtre Pediatric Radiology department, one must first mention Francis Brunelle: his intelligence, his shrewdness constantly devoted to his young patients, his qualities as a teacher are acknowledged by all. He was the initiator of the project which could not have been done without him as a driving force. At present he works and teaches in Hôpital des Enfants-Malades. Daniele Pariente, first as his resident and then as my associate with her deep knowledge of paediatric radiology and the scientific accuracy of her medical activity, is now directing the department in Bicêtre.

We owe special thanks to Jean-Yves Riou whose competence in cardiovascular radiology was inestimable for the completion of many of the exams. Gerard Harry was also a precious collaborator in this field. We must also quote the names of G. Kalifa, J. P. Montagne, P. Douillet and E. Urvoas and many residents and students who helped us.

I also want to thank Marc Savary with whom I started my career in vascular radiology.

P. Chaumont

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