EVALUATION OF THE DIFFERENT TECHNIQUES OF HEPATIC RESECTION

A Thesis submitted for partial fulfillment of the M.D. Degree in General Surgery

By

Mohamed Yasser Mohamed
MB, Bch, Msc General Surgery, Ain Shams University

٤٢٨٠٨

Under supervision of

Prof. Dr. Alaa El-Din Ismail
Professor of General Surgery
Ain Shams University

Prof. Dr. Amr Mohamed Helmy
Professor of General Surgery
Liver Institute, Menofia University

رسالة

Dr. Mohamed Helmy El Ghor
Assistant Professor of General Surgery
Ain Shams University

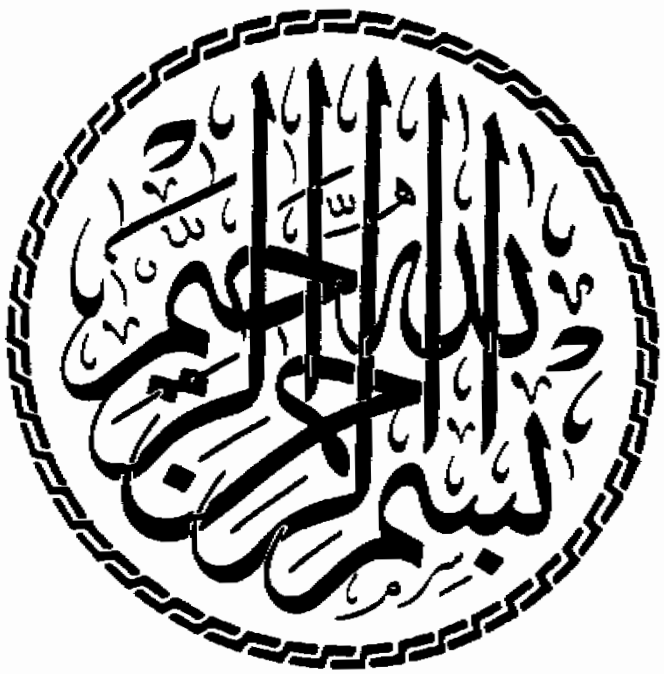
Dr. Mahmoud A. S. El Meteini
Lecturer of General Surgery
Ain Shams University

617.556
M. Y

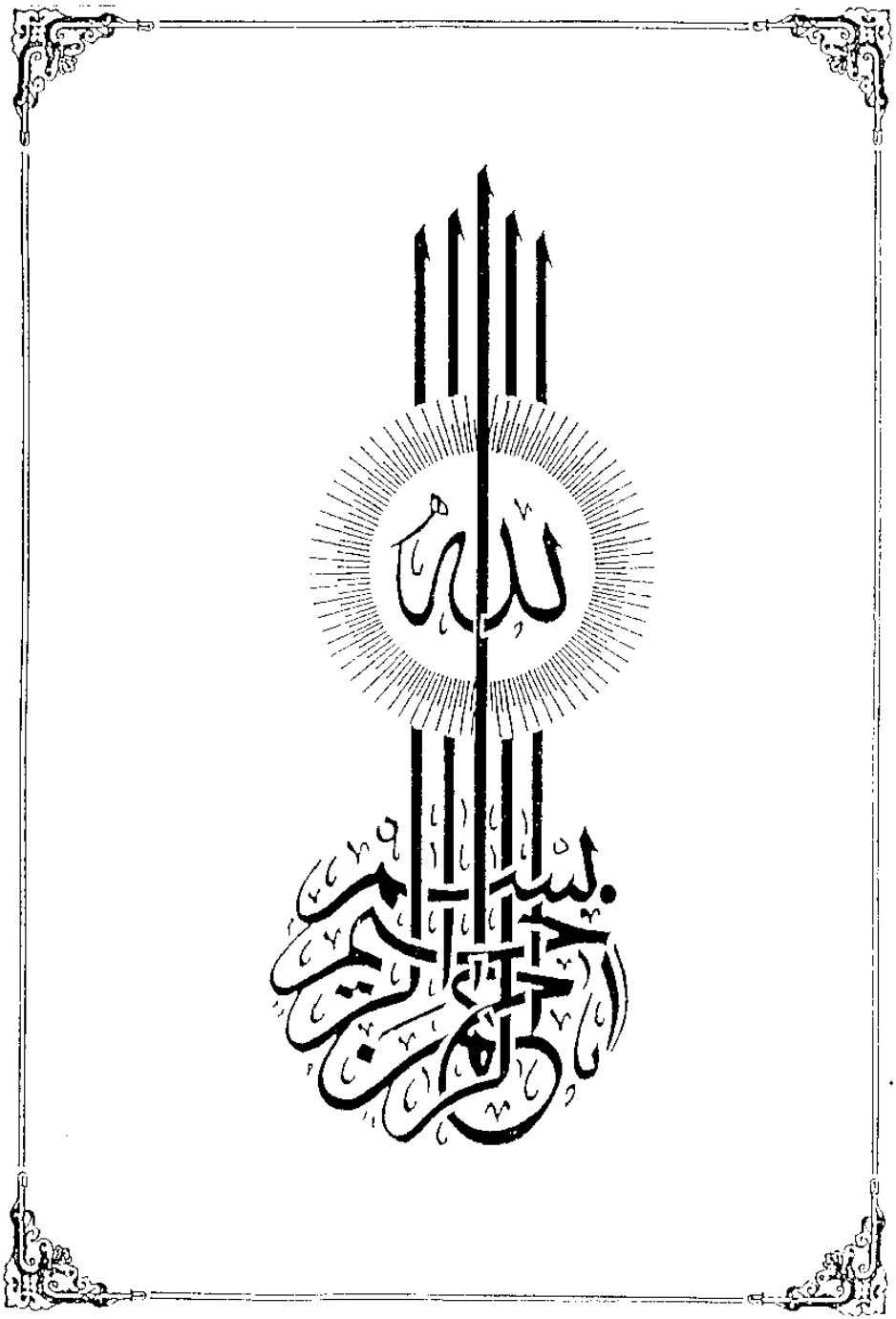
Faculty Of Medicine, Ain Shams University
Cairo-Egypt

1995

Central Library - Ain Shams University



Central Library - Ain Shams University



Central Library - Ain Shams University

Acknowledgment

It was indeed an honor to have been supervised by Professor Dr. Alaa El-Din Ismail, Professor of General Surgery, Ain Shams University. His incessant encouragement and fruitful remarks throughout the different phases of this work were of great value to me. I owe much to his guidance, and this work owed much to his insight and continuous support.

I do feel greatly indebted and grateful to Professor Dr. Amr Mohamed Helmy, Professor of General Surgery, Liver Institute, Menofia University, for his supervision, encouragement, and help throughout the accomplishment of this study, his valuable support, advice and guidance which were kindly given, along with the precious time he offered me inspite of his great responsibilities leave me greatly indebted.

I wish to express my deepest gratitude to Dr. Mohamed Helmy El-Ghor, Assistant Professor of General Surgery, Ain Shams University for his guidance, and stimulating suggestions which were of great help to me, his precious advice, constant help and kind patience in supervising this work, spending a lot of time and much effort to present this work in its proper way.

Indeed words do fail when I come to express my sincerest appreciation to Dr. Mahmoud A.S. El-Meteini, Lecturer of General Surgery, Ain Shams University, for without his dynamic efforts and ceaseless enthusiasm, this work would have never been completed. I owe him more than I can express for all the time he spent in revising every detail in this work. No words can be sufficient to express my special thanks and gratitude.

Central Library - Ain Shams University

I would be remiss, if I failed to acknowledge my family, the beloved women in my life, my great mother, dearest wife, lovely sister and precious daughter. For their tolerance of my absence, physically and emotionally, for their freely offered encouragement and for their faith in me and my task, many thanks.

M. Yasser
1995

Central Library - Ain Shams University

TO
THE SOUL
OF
MY FATHER

Central Library - Ain Shams University

CONTENTS

Central Library - Ain Shams University

Chapter I

INTRODUCTION

Central Library - Ain Shams University

Although battle surgeons had debrided small bits of liver protruding through wounds since ancient times, formal entry into the peritoneal cavity to staunch hemorrhage due to trauma or to remove tumors or drain cysts had to await the advent of general anesthesia and antisepsis. After a burst of pioneering activity from 1880 to 1910, little progress was made until after World War II. In the last 40 years, remarkable advances have been made in the techniques of liver resection, our understanding of liver diseases requiring operation and our ability to support patients through major resections (Foster, 1991).

The liver confounds the surgeons dependence on anatomy. Hidden beneath the ribs, it harbors diseases and silently grows tumors, often to enormous size, before they can be appreciated by the patient or by the fingers of an expert examiner. Its surface anatomy is deceptive and treacherous in that its only obvious plane leads into, rather than away from, one of its largest vessels. Its internal anatomy is no more trustworthy. No bloodless planes exist, as its complex inflow and outflow tracts cross at right angles (Attiyeh and Wichern, 1988)

The liver was one of the last organs of the body to yield to the rapid advances in surgery during the last half of the 19th century. Even today, most surgeons fear to broach its capsule, beneath which brisk

Central Library - Ain Shams University

hemorrhage from soft friable and landmarkless parenchyma can be expected. However, every surgeon who enters the abdomen must know something about the liver, because it may present a surprising finding at celiotomy or may reveal to the radiologist a lesion demanding a decision by the surgeon for treatment. Also blunt or sharp trauma may demand an immediate repair to save a life (Foster, 1991).

Progress in the last 30 years in our imaging and understanding of liver diseases has been enormous. Our ability to safely operate on the liver has also recently expanded with increasing experience and new techniques. However, as with most things in life and surgery, a careful review shows a prolonged and steady evolution, to which our ancestors contributed more than what we usually credit them with today. A look back at the beginning of liver surgery may put recent advances into perspective. It has been only hundred years since the first elective liver resection was performed (Schwarts, 1990).

Central Library - Ain Shams University

Chapter II

REVIEW OF LITERATURE

Central Library - Ain Shams University

EVOLUTION OF HEPATIC RESECTION

The evolution of hepatic resection from an imprecise removal of portions of the liver, frequently accompanied by extensive hemorrhage, to a controlled anatomic procedure with acceptable risk - represents a major advance in modern surgery. This accomplishment has been made possible by: 1) an appreciation of the segmental distribution of the blood vessels and bile ducts within the liver, 2) recognition of the functional reserve of the liver, 3) a better understanding of the hepatic function and the metabolic needs of the liver, 4) improvement in surgical techniques that have reduced the hazards of uncontrollable hemorrhage, and 5) data which have made a strong case for improved survival following resection of primary and metastatic malignancies of the liver (Schwarts, 1990).

The Ancient Period:

The Assyrian and Babylonian cultures of 2000 to 3000 BC used the livers of sacrificed animals to divine the future, a practice that spread to Greece and Rome and continued into the Christian era. There is no evidence that the Egyptians used this practice, but they did embalm

Central Library - Ain Shams University

their Pharaohs, carefully preserving selected internal organs including the liver, in a separate jar placed beside the mummy. This practice led to tolerance of human autopsy, which allowed the Greek-dominated school at Alexandria to continue dissecting the human body at a time when it was strictly proscribed throughout the rest of the Greek and Roman civilizations that dominated Western culture for so many centuries (Foster, 1991).

The Modern Period:

Much of today's success in elective liver resection relates to careful attention to the vascular anatomy of the inflow and outflow tracts. So - called anatomic resection has replaced wedge excision for all but the most peripheral lesions. The vascular anatomy of the liver was clearly outlined in 1654 by Glisson, but ignored thereafter until rediscovered and clarified in 1888 by Rex in Germany and Cantlie in England in 1897. The segmental classification of Couiaud in France in 1954 and the technologic advances in Japan from 1980 to the present were important contributions that have promoted ever more selective and limited resections without risk to the remaining liver (Foster, 1991).

Central Library - Ain Shams University

Any description of the development of the control of the hilar vessels of the liver would be incomplete without a mention of the intrepid J Hogarth-Pringle of Glasgow, Scotland. His report in 1908 described eight patients with liver hemorrhage from trauma, he conceived the idea of digital control of the hilum and found that it helped, and then published his famous report (Schwartz, 1990).

Many texts credit the French surgeons Lortat-Jacob and Robert with doing the first "anatomic" resection of the liver in 1952, but their work was preceded by that of many others. In 1909 Von Haberer of Germany ligated the left hepatic artery before resecting the left lobe of a boy with a large cystic tumor. In 1910, Wendell deliberately and successfully tied off the right hepatic artery and right hepatic duct before resecting a large adenoma from a 44 year old woman. As early as 1939, Meyer-May and Tung ligated specific vessels within the liver parenchyma when they encountered them in their so -called controlled resection (Foster, 1991).

Technical Tools:

The end of the 19th century saw the development of mattress sutures, which held sway until the 1950s. A few attempts were made at

Central Library - Ain Shams University

specific hilar control of vessels and ducts, but internal anatomy was largely ignored. The pioneers thought that the liver could not tolerate total occlusion of vascular inflow for more than a few minutes. It was not until 1978 when the French showed that a normal human liver might survive for up to 60 minutes with hilar clamping (Yamaoka et al, 1992).

Techniques and tools for the division of liver parenchyma are still evolving. Cautery and cold steel were reasonably effective in controlling hemorrhage from transected liver after the placement of mattress sutures. Lin et al, of Taiwan have often been given credit for devising the finger fracture technique although Anschutz of Germany described it in 1903. Ogilvie used the blunt end of a hemostat in 1951, and Quattelbaum used the blunt end of a scalpel to define and delimit the subtle difference in resistance between the thin walled blood vessels and liver parenchyma. The blunt suction tip and ultrasonic dissectors used by most surgeons today exploit this same difference. Both techniques are partially based on prior success by neurosurgeons with the similarly amorphous soft tissue of the central nervous system. Bismuth in 1986 advised the use of Kelly clamp for the transection of the parenchyma, he termed this method "Kelly-clasia" by analogy with digitoclasia (finger fracture) technique (Bismuth, 1986).

Central Library - Ain Shams University