MANAGEMENT STRATEGIES IN PANCREATIC TRAUMA

Essay

Submitted for Partial Fulfillment of
Master Degree in **General Surgery**

By

El Sayed Ahmed Ali Gad

M.B.B.Ch.,

Supervised By

Prof. Dr.Ahmed Mahmoud Saad El Din Ahmed

Professor of General and Vascular Surgery
Faculty of Medicine
Ain Shams University

Dr. Wageeh Fawzy Abd El Malek

Assistant Professor of General and Vascular Surgery
Faculty of Medicine
Ain Shams University

Dr. Wafi Fouad Salib

Lecturer of General Surgery
Faculty of Medicine
Ain Shams University

Faculty of Medicine
Ain Shams University
2011

استراتيجيات علاجية لإصابات البنكرياس

رسالة

توطئةً للحصول على درجة الماجستير فى الجراحة العامة

مقدمة من

الطبيب / السيد أحمد على جاد

بكالوريوس الطب والجراحة – كلية الطب – جامعة عين شمس

تحت إشراف

الأستاذ الدكتور/ أحمد محمود سعد الدين أحمد

أستاذ الجراحة العامة وجراحة الأوعية الدموية

كلية الطب ـ جامعة عين شمس

الأستاذ الدكتور/ وجيه فوزى عبد الملك

أستاذ مساعد الجراحة العامة وجراحة الأوعية الدموية

كلية الطب ـ جامعة عين شمس

الدكتور / وافى فؤاد صليب

مدرس الجراحة العامة

كلية الطب ـ جامعة عين شمس

كلية الطب

جامعة عين شمس

٢٠١١

List of Tables

LIST OF CONTENTS

ACKNOWLEDGMENT

After giving all thanks to ***GOD,*** *the most kind and the most merciful, who helped me to achieve this work*

I would like to express my deepest gratitude and appreciation to professor **Dr. Ahmad Mahamoud Saad El Din Ahmed** *Professor of General and Vascular Surgery, Faculty of Medicine Ain Shams University who had expressed so much sincere care and devoted much of his time. I'm deeply obligated for his kind supervision, unlimited help, keen interest and great encouragement during the progress of this work.*

I wish to express my sincerest and cardinal thanks to ***Dr.*** **Wageeh Fawzy Abd El Malek** *Assistant Professor of General and Vascular Surgery, Faculty of Medicine Ain Shams University for his great support and valuable guidance during this study.*

I would also like to express my great thanks to ***Dr. Wafi Fouad Salib*** *Lecturer of General Surgery, Faculty of Medicine, Ain Shams University for his kind help and encouraging assistance in performing this work.*

El Sayed Ahmed Ali Gad

List of Figures

Fig. No.	Title	Page No.

List of Figures

Fig. No.	Title	Page No.

List of Figures

Fig. No.	Title	Page No.

INTRODUCTION

Pancreatic trauma, while uncommon, presents challenging diagnostic and therapeutic dilemmas to trauma surgeons. Pancreatic injury is uncommon because the retroperitoneal location of the pancreas offers relative protection to the gland but it also increases diagnostic difficulty. It occurs in approximately 9% of patients with blunt abdominal trauma, and 8% of patients with penetrating abdominal injuries ***(Subramanian et al., 2007).*** Despite this, pancreatic injury is associated with a mortality of up to 30% and a morbidity of up to 45% ***(Degiannis et al., 2008).***

The signs and symptoms of pancreatic injury are vague and non specific ***(Degiannis et al., 2008)***.

The integrity of the main pancreatic duct (MPD) is the most important determinant of prognosis after pancreatic injury ***(Subramanian et al., 2007)***. Laboratory tests including initial serum amylase levels are not usually diagnostic; however, an increase in serial amylase level should prompt the suspicion of the pancreatic injuries ***(Takishima et al., 1997).***

Computed tomography (CT) scan is the modality of choice for evaluating stable patients with possible intraabdominal injuries. Sensitivity and specificity of CT scan for pancreatic injuries is more than 85% ***(Lin et al.,***

2006). The hallmarks of pancreatic injury on CT scan are edematous pancreas, peripancreatic hematoma, edema in the retro-peritoneum and laceration to the body of the pancreas.

Endoscopic retrograde pancreatography (ERCP) is considered the standard modality for evaluating the pancreatic duct. ERCP can be used for diagnostic as well as therapeutic purposes. Extravasation of contrast from the duct is the hallmark of ductal injury ***(Buccimazza, 2006).*** Recently, ERCP has also been used to stent proximal duct injuries ***(Lin, 2006).***

Magnetic resonance cholangiopancreatography (MRCP) is a non-invasive imaging modality used to identify pancreatic duct injury. The sensitivity of MRCP is less than the ERCP in acute injury ***(Lin, 2004)*** and sensitivity can be increased by secretion stimulation. MRCP can provide visualization of the entire pancreas and pancreatic duct as well ***(Gillams, 2006).***

Blunt trauma to the pancreas is relatively rare and is one of most easily overlooked intraabdominal injuries. Delay in diagnosis lead to high morbidity ***(Lopez et al., 2005).*** Major early complication are pancreatitis, pancreatic abscess, necrosis, pancreatic fistula and pseudocyst.

Surgical techniques used to treat pancreatic or pancreaticoduodenal injury are many and varied. They include simple drainage, debridement and drainage, distal pancreatectomy with or without splenic salvage, near total pancreatectomy, creation of a roux loop to drain the injury, and pancreaticoduodenectomy (Whipple procedure including the traditional, the pyloric spaning, and the total pancreatectomy variants) ***(Mattix, 2007).***

Only about 20 percent of patients with pancreatic injuries requires surgical resection of some sort, whether distal pancreatectomy or whipple procedure ***(Cogbill, 1982).***

AIM OF THE WORK

This work aims to provide updated approach to the management of pancreatic injuries.

ANATOMY AND BLOOD SUPPLY

Introduction

The primary functional units of the pancreas divide easily into endocrine cells and exocrine cells. The endocrine cells, arranged mainly in groups as islets of Langerhans, are specialized in that different peptides (glucagon, insulin, somatostatin, pancreatic polypeptide) are located in different cells (α, β, δ, and PP), whose secretions are delivered to other parts of the body via the bloodstream. Acinar exocrine cells are essentially of one type, although each one contains a myriad of different substances. The secretions of these cells are carried away through the ductal system, which is composed of mostly plain-appearing epithelial cells, some of which display mucous granules. Ductal cells, however, have important secretory functions.

A robust vascular system provides functional support for the pancreas. Lymphatic vessels aid in the removal of fluid from the extracellular matrix. Nerves mediate secretion of endocrine and exocrine cells, and relay the condition of the pancreas. Connective tissue is arranged to support the epithelial cells; it forms the walls of ducts, surrounds and penetrates lobules, and serves as the environment for transmission of vessels and nerves.

Normal function of the pancreas is possible due in part to compartmentalization. Secretory products stored in acinar and endocrine cells are sequestered in membrane-bound packets. The interior of epithelial cells is separated from the extracellular matrix by a plasma membrane, so signaling for secretion is controlled through receptors and channels. Basal laminae provide a micromolecular sieve along the base of epithelial cells. The lumina of the exocrine pancreas are separated from the extracellular matrix by tight junctions between acinar cells and ductal cells. Secretion products are thereby modified within the lumen and maintained without entering it altering the extracellular matrix. An overview of the architecture of the pancreas provides a framework against which changes due to pancreatic disease may be evaluated ***(Bockman et al., 1997).***

Macroscopic anatomy

The pancreas is located against the posterior body wall. Most of its anterior surface is covered by peritoneum. Behind the peritoneum, it is surrounded by connective tissue, blood vessels, nerves, and lymphatic vessels and nodes. It lies anterior to the aorta at a level just below the entry of the aorta into the abdominal cavity through the diaphragm. In a cross-sectional view, as would result from computed tomography or magnetic resonance imaging, its middle section protrudes anteriorly in front of the spinal column and aorta.

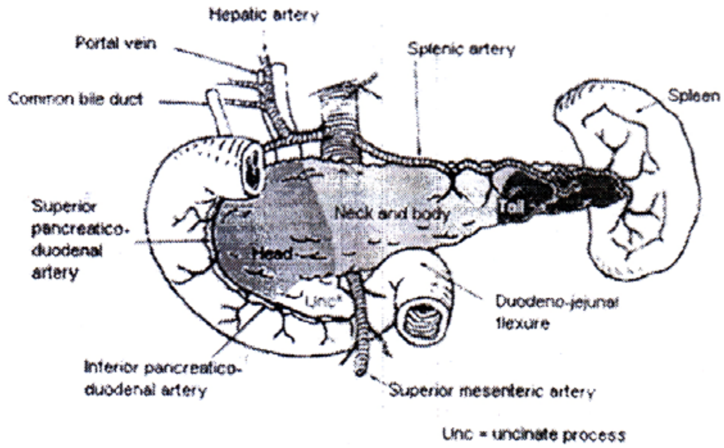

Figure (1): Regional anatomy of the pancreas – the three pancreatic regions include the head/uncinate process; the neck/body; and the tail ***(Kimura et al., 2004)***

The regions of the pancreas are described as head, neck, body, and tail. The head is tucked into the curve of the duodenum; its substance is associated intimately with the concave surface of the duodenum. An extension from the head, the uncinate process, curves behind the superior mesenteric artery and vein. The tail is the opposite end of the organ; it attenuates somewhat as it extends toward the hilus of the spleen. The body lies between head and tail. Its border with the tail is ill-defined. The border between head and body is a slightly thinned region, referred to as the neck, that is defined by the passage along its posterior surface of the superior mesenteric vein and its continuation