Management of Gastric Cancer

Essay

Submitted for Partial Fulfilment
of Master Degree in
General Surgery

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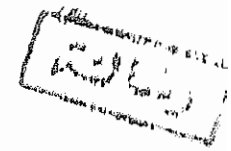

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1995

﴿بسم الله الرحمن الرحيم﴾

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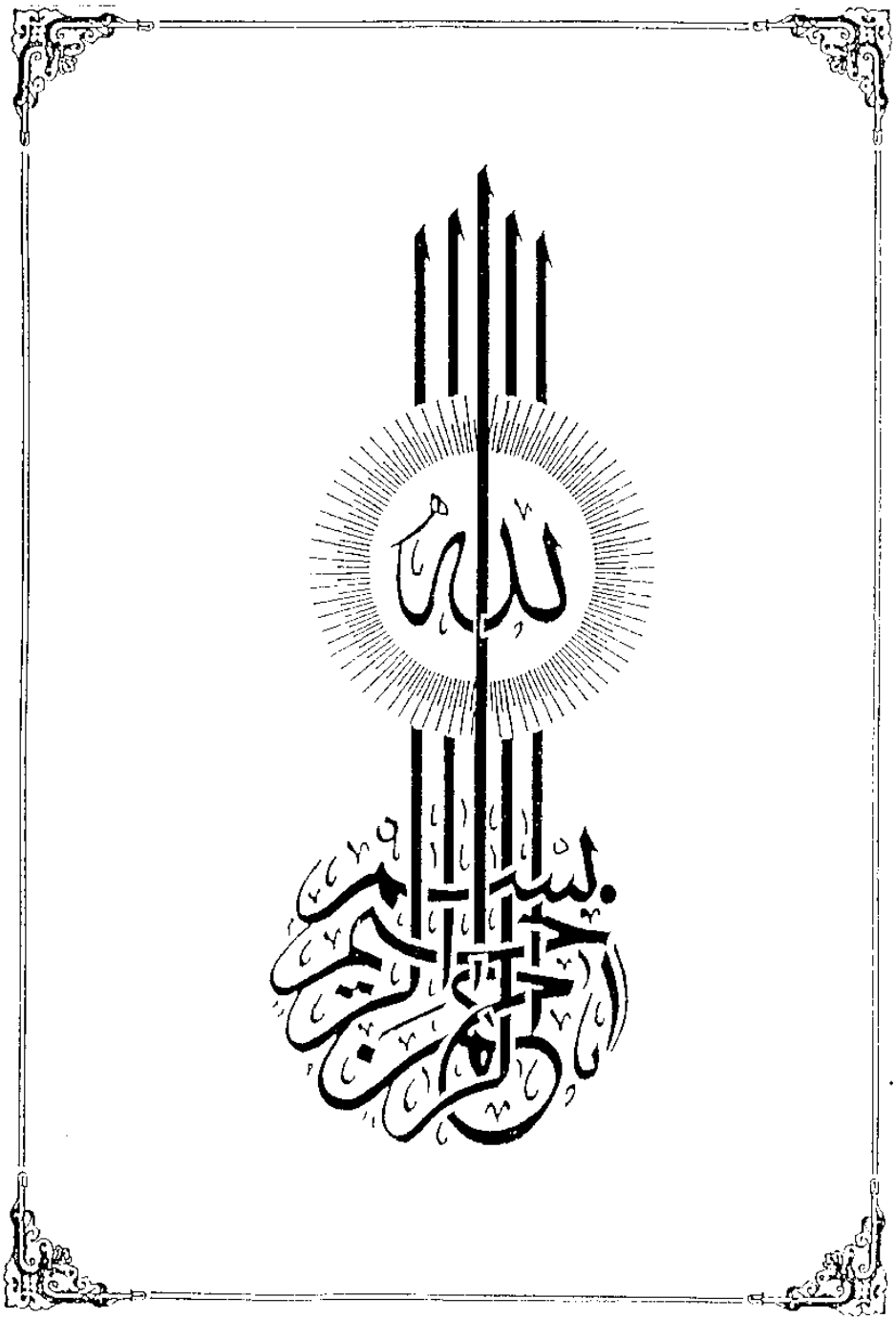
صدق الله العظيم

سورة طه (أية ١١٤)



Acknowledgment

I would like to express my appreciation and thanks to Professor Dr. ***Ahmed Tawfik Zaki Souidan*** Professor of General Surgery, Faculty of Medicine, Ain Shams University, for his valuable advices and continuous guidance throughout the whole work.

My thanks and gratitude to Dr. ***Sami Ahmed Abd El-Rahman*** lecturer of General Surgery, Faculty of Medicine, Ain Shams University, as by his continuous honest guidance and advice this work was brought to light.

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Introduction

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Gastric carcinoma is one of the leading causes of death worldwide. It is the most common malignancy encountered in the Far East, as well as some areas of Northern Europe, and South America ***(Dupont, 1978).***

In the United States, the incidence of Gastric Cancer has declined over the last 30 years, yet the incidence of proximal Gastric Cancers appears to be rising rapidly, ***(Blot & Devesa, 1991).***

The American Cancer Society projects that about 20000 new cases of gastric cancer were diagnosed in 1991 and that about 15000 patients will die from the disease, indicating the aggressive nature of this tumour, ***(Boring, Squires, 1990).***

About 50% of the patients have widely metastatic disease at their initial presentation precluding any form of meaningful therapy. The remainder undergo surgical exploration with complete surgical resection accomplished in only half of them. The reported 5 years survival of surgically resected patients approaches 15%-20% whereas the overall survival of patients with gastric carcinoma is about 10%. (**Gunderson & Sosin 1982**). Unfortunately, even in completely resected patients local or distal failures are common ***(Fein & Kelsen 1985).*** This goes along with the (UNION INTERNATIONAL CENTER OF CANCER) reporting that

the overall 5 years survival of patients with gastric carcinoma has not changed significantly over the last three decades and remain at 10-15% *(Cuschieri, 1986).*

On the contrary, great improvement have been achieved in methods of diagnosis and surgical techniques and this should provide hope and encouragement regarding future prospects, which appear clearly in the Japanese experience over the last 20 years evidenced by an increased resectability rate and improved overall 5 years survival following resection to 40-50% *(Cuschieri, 1986).*

Carcinoma of the stomach can be cured by gastrectomy and only by this method can the patient's life be saved. All non surgical methods of therapy, including the use of deep x-ray and radium, have a mortality of 100%. Furthermore, cure is possible only when the disease is diagnosed early and resection is radical. Afterall, unless the diagnosis is made early no technical skill will save the patient with gastric carcinoma. *(Remine, 1985).*

Although generalized dissemination of gastric carcinoma does occur, a study on reoperated cases has shown that in 53% of patients who relapse following resection, the gastric remnants and adjacent bed are the only site of recurrent disease. A method of loco-regional control of gastric carcinoma should therefore impart a substantial benefit to sufferers from

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the disease. An option is to employ post-operative radiotherapy using the technique proposed by Gunderson, Sosin, (1982) that is designed to include the area of distribution of a loco-regional failures with minimal renal damage. The British Stomach Cancer Group are evaluating this approach using adjuvant radiotherapy after radical gastrectomy and comparing its effect on survival with surgery alone and surgery followed by Mitomycin C, Adriamycin & 5 FU (M A F) combination chemotherapy ***(Gunderson & Sosin, 1982).***

The Japanese experience points to an alternative approach, more radical standardized surgery to minimize the incidence of residual local disease. The Japanese would appear to have achieved this objective with a remarkably low post-operative mortality after resectoin.

The surgical staging and treatment of gastric cancer in UK remain inadequate with an operative mortality after total gastrectomy of 20%-25% and an overall 5 year's survival of 5% ***(Osmond et al., 1983).***

Surgical Anatomy of the Stomach

Surgical Anatomy

The stomach is a local expansion of the alimentary tube interposed between the termination of the oesophagus and the beginning of the small intestine its shape is modified by various factors, among which are functional activity, volume of contents, disease, and changes in the surrounding viscera. ***(Anson & McVay, 1984).***

The openning from the oesophagus into the stomach is the cardiac orifice, situated to the left of the midline behind the seventh costal cartilage, 2.5cm (1 inch) from its sternal junction at the level of the eleventh thoracic vertebra. The right side of the oesophagus is continued as the lesser curvature, while its left side joins the greater curvature at an acute angle, the cardiac notch. The part of the stomach above the level of the cardiac orifice is the fundus, an inappropriate term but it is the bottom of the stomach when approached surgically from below. ***(Williams et al., 1989).***

The corpus or body of the stomach lies more or less longitudinally and extends from the level of the cardiac incisura to the level of the angular notch. The remainder of the stomach is formed by the antrum and ends at the pylorus where the circular muscle condenses to form the pyloric sphincter. The pylorus is recognized at laparotomy by a small

prepyloric vein (of Mayo) or veins on its anterior aspect. *(Carter & Johnstone, 1986).*

The pyloric region has been shown to have a complex anatomical structure. On the greater curve of the stomach, the circular muscle thickens to form two discrete muscle loops: The proximal and the distal pyloric sphincters. These loops define the anatomical borders of the pylorus, and they enclose a sheet of circular muscle between them. The distal sphincter or loop exists for only a short distance at the narrowest point of the gastroduodenal junction and is thus quite distinct. The proximal sphincter is less prominent, occuring over a longer segment of the greater curvature. The two sphincters are clearly separated only on the greater curve aspect, while on the lesser curve they fuse with the circular muscle of the pyloric channel to form a muscular knob known as the pyloric torus. The distal sphincter and the torus form the thickest portion of the gastroduodenal junction and are generally regarded as the main pyloric sphincter. It ends abruptly with a clearcut change to the much thinner duodenal musculature *(Jamieson, 1992).*

Peritoneal attachement of the stomach:

Apart from a small area on its posterior aspect just below the gastro-oesophageal junction, the stomach is completely invested by peritoneum, at the lesser curvature the peritoneum covering the anterior and posterior walls forms the lesser omentum which passes upwards to the liver in the

region of the porta hepatis, at the greater curvature, the peritoneal layers meet to form the greater omentum, the gastrosplenic ligament and the gastrophrenic ligament. The lesser sac lies behind the caudate lobe of the liver, lesser omentum and stomach *(Carter & Johnston, 1986).*

Histologically at low magnification the luminal surface of the mucosa appears honey combed by small depressions or alveoli, polygonal or slit-like, about 0,2mm in diameter. These gastric pits contain the orifices of gastric glands, the whole surface, including the pits, is covered by simple secretory columnar epithelium (the surface mucous cells) which liberate mucus from their apices as a lubricant and also to protect the gastric lining against its own secretions and enzymes. The gastric glands comprise three categories:

(1) Cardiac glands: confined to small area near the cardiac orifice.

(2) The main gastric glands: in the body and fundus.

(3) Pyloric glands. *(Wiliams et al., 1989).*

Blood supply of the stomach:

The stomach recieves a rich arterial supply from the celiac (axis) artery, which arises from the aorta just above the neck of the pancreas and at once trifurcates into the left gastric (coronary), splenic and hepatic arteries. These trunks and their branches form arterial arcades related respectively to the greater and lesser curvatures. *(Anson & McVay, 1984).*

These vessels not only anastomose extensively on the serosal aspect of the stomach but also form anastomotic networks within its walls at intramuscular, submucosal and mucosal levels; a true plexus of small arteries and arterioles is present in the submucosa. So; blood supply is excellent. *(Williams et al., 1989).*

The arterial arcades are, one along the smaller and one along the greater curvature. The smaller arcade is formed by the right and left gastric arteries, the greater one by the right and left gastroepipolic arteries. From a functional standpoint it seems more correct to describe arcades along both curves than to divide them artificially into four arteries. Because the greater arcade reaches the stomach only half-way, the upper part of the greater curve needs an extrablood supply coming from the "short" gastric vessels, from the inferior phrenic artery, from the posterior gastric artery (36% arising from the splenic artery), and possibly from an accessory left gastric vessels (12%).

Within the ramifications of the greater arteries, a supraduodenal and a supra- and infrapyloric branch and retroduodenal branches may be discerned. In an effort to ban terms of Greek derivation, the international nomenclature committee has changed the term "gastroepiploic" to "gastro omental" artery. *(Jean Pierre & Vandamme, 1993).*