HIGHLY SELECTIVE VAGOTOMY

ESSAY

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By
AMR NASR YACOUB
M. B. ; B. Ch.

Supervised by

Assistant Prof. Dr. MOHAMMED RAGHEB
Assistant Professor of General Surgery
Ain Shams University

Prof. Dr. YASSIN M. YASSIN
Professor of General Surgery
Military Medical Academy

Faculty of Medicine
Ain Shams University

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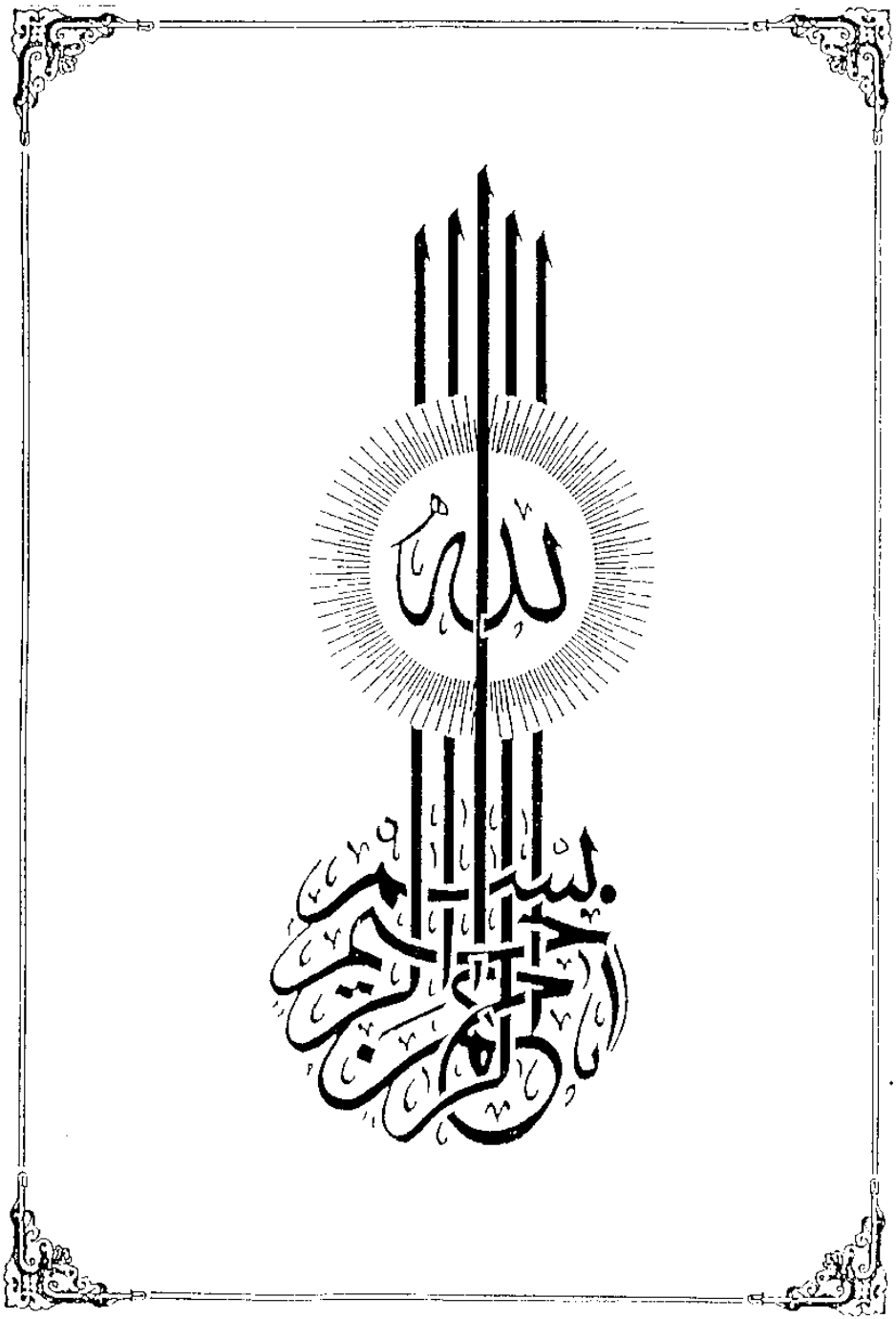

C O N T E N T S

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INTRODUCTION

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Peptic ulceration results from corrosive action of the acid gastric juice on a vulnerable mucosa. Appreciation of the central role of acid in the ulcerogenic process has led to the emphasis on its therapy by antacids and H_2-receptor antagonists medically and by acid reducing operations surgically. (J.Englebert Dunphy, 1981).

The more commonly used of the acid reducing operations is vagotomy which is now widely practiced for the treatment of duodenal ulceration. This is because of its satisfactory success rate, minimal operative mortality, and low post-operative morbidity. (Powis et al., 1972).

Vagotomy in its various techniques including truncal, selective, highly selective and newer modifications namely lesser curve superificial seromyotomy is the main pillar on which surgical treatment of duodenal ulcer rests (Amdrup, 1977).

When post-operative complications after highly selective vagotomy were reported in the seventies,

there were fewer side effects compared with other ulcer operations, further more the safety of the operation and the paucity of serious post-operative complaints were consistently substantiated, supporting the conclusion that this operation achieves the goal of minimizing post-operative morbidity (Philip et al., 1984) so, highly selective vagotomy without drainage for duodenal ulcer is a very safe operation and is followed by significantly fewer serious side effects than are most other elective operations (Goligher et al., 1978).

HISTORICAL REVIEW

HISTORICAL REVIEW OF SURGICAL TREATMENT OF PEPTIC ULCER

Initial development of surgical procedure for peptic ulcer was empirical. The subsequent evolution has been guided by demonstration of physiological mechanisms controlling gastric secretion (Davis Christopher, 1977).

It is appropriate in the 150th birth day year of Theodor Billroth, the father of gastric surgery, that we recall our debat to him as well as to many others such as Beaumont, Roentgen, Cannen, Pavlov, Wangensteen, Dragstedt, Harkins, Mann, Ivy Greogry, Grossman and their pupils. In addition, in view of the dramatic decline in the number of patients with duodenal ulcer and the effectiveness of the H_2-receptor antagonists in controlling the acid factor. It is appropriate to remained our successors that the problems of gastric surgery have been among the most challenging (Zollinger, 1980).

The first simplest operation ever devised for the lesion is gastro-enterostomy. The procedure was first done in 1881 by Wlfler to bypass a carcinomatous obstruction of the pylorus.

Doyen in 1893 whose the first to use it for stenosis as a result of duodenal ulcer. It was widely adopted later because of its simplicity and relative safety. However increasing incidence of stomal ulceration was observed (about 34%). So, the operation was gradually abondoned (Davis Christopher, 1977).

The first successful gastric resection was performed by Theodor Billroth in Vinna in 1881 when he excised an obstructing carcinoma of the pylorus and performed a gastroduodenostomy. In 1882 Von Rydiger performed the first gastric resection for ulcer disease. As operative techniques improved, surgeons became more radical and by 1940 the term subtotal gastrectomy was intrepreted as denoting removal of the distal 66 - 75% of the stomach (Davis Christopher, 1977). After resection, the continuity of the gut can be resorted by gastro-duodenostomy (Billroth I) or gastro-jejunostomy (Billroth II). Polya in 1911 introduced his operation which was partial gastrectomy and retro-colic gastro-jejunostomy (Zollinger, 1980).

The extensive gastric resection was found to be complicated frequently by dumping and weight loss, in addition to the high mortality rate (Zolinger, 1980). Dragstedt and Owen in 1943, had upset the routine operations of gastric surgery demonstrating that the acid factor could be controlled by truncal vagotomy. Truncal

vagotomy has obvious advantages mainly low mortality rate, however it denervates the antral pump, resulting indelayed gastric emptying.
Dragstedt later added a drainage procedure (posterior gastro-jejunostomy). (Zollinger, 1980).

Also, Dragstedt and Tanner 1944, advocated anterior gastro-jejunostomy made in the pre-pyloric region. The risk of recurrent ulcer is less and if it does occur, it will be easier to deal with (A.J. Harding Rains and H.David Ritchie, 1979).

Also, Heinke Mickulicz's pyloroplasty (1888) and Finney's pyloroplasty (1902) are used to produce free drainage by division of the pyloric ring (A.J. Harding Rains and H.David Ritchie, 1979). After the introduction of truncal vagotomy procedure was combined with gastric resection. Excision of the antrum and destruction of both vagi remove the major stimulus to acid secretion (Zollinger, 1980).

As truncal vagotomy denervates not only the stomach but also all other abdominal viscera with increasing incidence of dumping, diarrhoea and the frequently of

incompleteness of truncal vagotomy, selective vagotomy, was introduced by Franksson and Jackson in 1948 and quite independtly (Burge et al., 1964, Griffith 1966). In this operation the vagi are divided below the points of origin of the hepatic branch of the anterior vagus and coeliac branch of posterior vagus (Goligher et al., 1974).

The most exciting development in the surgical treatment of duodenal ulceration in recent years what was termed in 1970, by Johnston and Wilkinson of leeds highly selective vagotomy and in the same year and quite independently Amdrup and Jensen of Copennagen parietal cell vagotomy. In this operation only the acid-secreting proximal segment of the stomach (Corpo-funcus region)are denervated with preservation of antral innervation via the anterior and posterior nerves of latarjet (Goligher et al.,1974).

Although, highly selective vagotomy was widely accepted, some surgeons thought it was tedious and time consuming in addition to increase risks of damage to the nerve of latarjet producing gastric stasis and there is small risk of ischaemic necrosis which when it does occur is not uncommonly fatal. So Taylor (1978) introduced the operation of lesser curve superficial seromyotomy (Jitendra et al., 1984).

Amdrup and Griffith(1969) pointed out that failure to identify exactly the components of the vagal system such as multiple fibres of oesophageal plexus or criminal nerve are sources of incomplete vagotomy and significant recurrence.

Petro-Poulos, (1980) suggested trans-gastric intramural transection and excision of the vagal and perhaps splanchnic nerves. This avoids extensive hiatal perioesophageal dissection which not only enlarges the operative field and extends the operation but also increases the moribidity particularly post-operative dysphagia and cardiospasm (Petro-pubs,1980).

SURGICAL ANATOMY OF THE VAGUS NERVE

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Vagus nerve is the para sympathetic supply to the heart and lungs. It is motor to the oesophagus, stomach, gall bladder and bowel and secretory to the stomach and pancreas (Plessis, 1975).

The nucleus of the vagus nerve lies in the medulla oblongata in the vagus trigone present in the floor of the 4th ventricle caudal to that of glosso-pharngeal (Last, 1978).

The fibres of the vagus nerve are connected to 4-nuclei in the medulla oblongata (Plessis, 1975):

a) Nucleus ambigeus; voluntary motor nucleus.

b) Dorsal motor nucleus: which is responsible for visceral (involuntary), motor innervation to the oesophagus; stomach, gall bladder and bowel and secretory to the stomach and pancreas.

c) Tractus solitarius sensory innervation to pharynx and larynx through neurons whose cells lie in the ganglion nodosum.

d) Spinal nucleus of trigeminal nerve (Plessis,1975) It emerges from cranial cavity through its middle compartments of the jugular foramen, the vagus