Histopathological Evaluation of Gastric Carcinoma A Five Year Retrospective Statistical Analysis

Thesis Submitted for Fulfillment of Master Degree in Pathology

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Abstract:

Gastric cancer is the fourth most common cancer and the second leading cause of cancer – related death in the world .In this study cases are collected from reports of pathology departments of Kasr El –Aini hospital and Al –salam centre, all speciemens are stained with H &E stain and examined by light microscope ,statistical analysis is done to evaluate incidence of cases &relationship of the disease to other features as: gender ,location ,results :males are more affected ,ulcrating gross pattern is more common and pylorus is the commonest site involved by the tumour.

Key words: Gastric cancer . statistical analysis . incidence . location

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AJCC	:	American Joint Committee on Cancer
CIS	:	Carcinoma in Situ
CT	:	Computed Tomography
EBV	:	Epstein Barr Virus
EGC	:	Early Gastric Cancer
GC	:	Gastric Carcinoma
H & E	:	Haematoxylin and Eosin
H. Pylori	:	Helicobacter Pylori
JCGC	:	Japanese Classification for Gastric Carcinoma
LN	:	Lymph Node
MRI	:	Magnetic Resonance Imaging
PM	:	Proper Muscle
UGI	:	Upper Gastrointestinal
WHO	:	World Health Organization

Content

Aim of the Study

Revision of all available archival material of gastric carcinoma in the last 5 years (2004-2008), collected from the pathology department, faculty of medicine, Cairo University, Kasr El-Aini Hospital and from Al-Salam Oncology Centre.

Revision and reclassification of all slides according to the latest grading and staging systems.

Statistical evaluation & correlation between clinical and patient data available in the request sheet and pathological findings of value, particularly for prognosis.

Review of the Literature

Anatomy and histology

The stomach is an expanded portion of the alimentary tube. It is connected proximally to the oesophagus through the cardia and distally to the duodenum through the pylorus.

The cardia is the zone found just distal to the lower end of oesophagus, it is small ill defined and extends 1 to 2cm.

The pyloric portion comprises the distal third (4 to 5cm) of the stomach, it is subdivided into the pyloric vestibule and the antrum ***(Lawson, 1988)***, the stomach can be divided into four regions cardia, fundus, body and antrum ***(Owen, 1986)***.

Histologically the stomach is also subdivided into three zones corresponding roughly to the four gross anatomic regions ***(Rubio et al., 1991)***.

A transmural section through the gastric wall demonstrates that the stomach is formed of four distinct layers namely gastric mucosa, submucosa, musclosa propria and serosa ***(Owen, 1989)***.

Normal gastric mucosa:

The gastric mucosa consists of simple epithelium, delicate stroma of connective tissue known as corium or (lamina propria) and muscularis mucosa, the epithelium of gastric mucosa can be divided into two distinct strata: the superficial layer which remains the same throughout the stomach and the deep layer which is of variable composition.

The surface epithelium: consists of one layer of high columnar cells these cells have a small, round, basal nucleus and pale cytoplasm the distal end of each cell contains mucus, the mucus which they and other cells secrete serves protective and lubricating functions ***(Yeomans, 1985)***.

The deep layer of gastric mucosa: three types of mucosa can be distinguished.

- *Cardiac mucosa*: The cardiac glands are histologically quite similar to pyloric glands and mucus neck cells of fundic glands however these glands appear to be more coiled and dilated and the pits are not so deep as in the pyloric region. The cells forming the cardiac glands are predominantly mucus secreting cells, with few parietal cells and rare enteroendocrine cells ***(Helander et al., 1986)***.
- *Body mucosa:* Those glands lie in the fundus and the body are known as gastric glands proper, they occupy the largest area of the stomach. The pits here are relatively short and occupying one quarter of mucosal thickness ***(Owen, 1986)***.
- *Pyloric (antral) mucosa:* Occupy an area in the distal part of stomach that correspond to the anatomic pyloric area, the gastric pits are much deeper and occupying nearly half thickness of the mucosa. The pyloric glands are simple or branched and coiled tubules they are also less tightly packed than gastric glands ***(Helendar, 1986)***.

Lamina propria: Is that layer of fibroreticular connective tissue situated between the surface epithelium and muscularis mucosa and

forming the stroma in which the gastric glands are embedded, the superficial lamina propria between gastric pits contains only small numbers of lymphocytes, plasma cells, esinophils and histocytes together with a fine capillary plexus and non myelinated nerves ***(Owen, 1986)***.

The muscularis mucosa: Consists of a poorly defined inner circular and outer longitudinal layer of smooth muscle fibers ***(Owen, 1986)***.

The submucosa:

It consists of loose connective tissues including small collections of fat cells, with mast cells and some esinophils. It is entirely free from glands ***(Lawson, 1989)***.

The muscular coat:

It consists of three layers of smooth muscle fibers an inner oblique, a middle circular and outer longitudinal layer. The inner oblique is present in cardiac and fundic regions but is totally absent from the pyloric region ***(Owen, 1986)***.

The outer longitudinal muscle fibers are continuous with that of oesophagus, while the circular muscle layer is aggregated into a definite sphincter mass at the pylorus ***(Day, 1987)***.

The serous coat:

It is the outermost layer of the gastric coats it consists of a thin layer of connective tissue covered with a layer of flat mesothelial cells ***(Owen, 1986)***.

Pathology of gastric carcinoma

Epidemiology and risk factors:

Gastric cancer is the fourth most common cancer and the second leading cause of cancer–related death in the world ***(Parkin, 2004)***.

Ninety percent of all tumors of the stomach are malignant, and gastric adenocarcinoma comprises 95% of the total number of malignancies ***(Schwartz, 1996)***.

In spite of the improvements in the treatment, the worse prognosis of gastric cancer is correlated with tumor invasion ***(Rivera, 2007)***.

Gastric cancer is rare before the age of 40, but its incidence steadily climbs thereafter and peaks in the seventh decade of life ***(Gore, 1997)***.

When the disease is confined to the mucosal or submucosal layers of the stomach (early gastric cancer), the 5- year survival rate is 95%. In contrast, when extended to the muscularis propria or serosa (advanced gastric cancer); the survival rate is lower than 10% ***(Nomura, 2007)***.

Because most cases of gastric cancer are asymptomatic until advanced stage, the diagnosis of early gastric cancer is difficult ***(Nomura, 2007)***.

In recent years particular combinations of genetic alterations (gene amplification and point mutations) in cancer-related genes have been implicated in the pathogenesis of this tumor ***(Yasui, 2005)***.

However, these alterations vary according to histological subtypes indicating distinct carcinogenetic pathways of gastric cancer ***(Tamura, 2006)***. Thus, a direct application to early diagnosis of gastric cancer is precluded. Therefore new molecular markers for early diagnosis of

gastric cancer are needed.

Correa (1992) stated that the prepyloric region is the most common site of gastric carcinoma. However when carcinoma follows pernicious anaemia it is more likely to be fundal and polypoid. Carcinomas located in the fundic area are more likely to invade the submucosa and beyond at the time of surgery than those located in the pyloric area ***(Yamada and kato, 1989)***. Multiple tumors are found in about 6% of the cases ***(Kosaka et al., 1990)***.

The male to female ratio is about 1.5:1 ***(Ming, 1977)***.

In about 2 %of cases, the carcinoma occurs in the young people, under the age of 35 years with a reversed male to female ratio of 1:2.9 ***(Tso et al., 1987)***.

There is wide geographic variation in the occurrence of gastric cancer. Economically developing countries generally have higher incidence and mortality rates of the disease than developed countries ***(Kamangar, 2006)***.

Gastric cancer incidence and mortality rates declined in many countries over the course of the 20thcentury ***(Howson, 1986)***. Possible reasons that have been hypothesized to explain the decline have included increased fruit and vegetable consumption, decreased intake of foods preserved with salt or by smoking, declines in salt intake, widespread availability of refrigeration, and the reduced prevalence of helicobacter pylori infection ***(Moehler, 2007)***.

Micronutrients, including vitamin E, carotenoids, selenium, and especially vitamin C (ascorbic acid), all have been linked with the reduced risk ***(Hansson, 1994)***.