

Histological and Histochemical Study the Fundic Region of Stomach in Adult Local Rabbit (*Oryctolagus Cuniculus*)

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Abstract

The importance of this study histological and histochemical to the fundic region of stomach in adult local rabbit to detected the type of glands in this region and type of secretion. Twelve adult local rabbits used in this study. Animals were deeply anesthetized by mixture ketamine and xylazine intramuscular injection, exsanguinated via the jugular vein and the stomach was immediately excised, and detected the fundic region to prepare histological sections. uptake eight tissue samples from this region, The fundic region wall in rabbit consist from the following tunics; mucosa, sub mucosa, muscularis & serosa. the first layer mucosa lining by epithelial tissue, simple columnar epithelium tissue. The glands in fundic region appear as simple divided tubular long straight over most of their length and wide at base portion, the glands in this region consist from the following cells, mucous cells, stem cells, oxyntic cells, enteroendocrine & peptic cells.

Keywords: histological, histochemical, fundic

دراسة نسيجية وكيميائية للمنطقة القاعية في المعدة في الأرنب المحلي البالغ (*Oryctolagus cuniculus*)

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الخلاصة

أهمية هذه الدراسة النسيجية والكيميائية للمنطقة القاعية للمعدة في الأرانب المحلية البالغة. تم استخدام اثني عشر أرنباً محلياً بالغاً في هذه الدراسة. تم تخدير الحيوانات بعمق بحقن الكيتامين والزيلازين العضلي، ثم عمل قطع في الوريد الوداجي لاجتثاث عملية نزف للحيوان من أجل اخراج الدم من الجسم، وبعد اتمام عملية النزف تم اخذ المعدة مباشرة وحفظها في مادة الفورمالين وبعدها تم تحضيرها لعملية التقطيع النسيجي. يتكون جدار منطقة القاع للمعدة من الطبقات النسيجية التالية؛ الطبقة المخاطية، تحت المخاطية، عضلية ومصلية. تتكون الطبقة الأولى المخاطية من نسيج ظهاري عمودي بسيط. تظهر الغدد في المنطقة القاعية غدد أنبوبية وطويلة مستقيمة وعريضة عند الجزء الأساسي، وتتكون الغدد في هذه المنطقة من الخلايا التالية: الخلايا المخاطية، الخلايا الجذعية، الخلايا الجدارية، الخلايا المعوية والخلايا الرئيسية.

1. Introduction

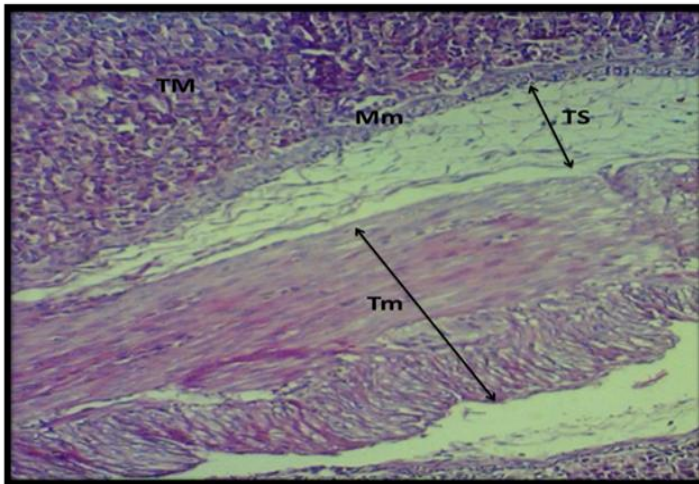
Rabbits have proven to be extremely useful models in various fields of biological research, including embryology, toxicology, and pathology. Internal organs are a primary subject of research, requiring a thorough understanding of their precise location, growth, structure, and tissue composition. [1][2]. The rabbit's unilocular stomach consists of three parts: the cardia, the fundus, and the pylorus. Each of the latter three regions contains different types of glands. [3][4]. During early embryonic development, the digestive tract initially forms a simple intestinal tract without distinct features. As development progresses, the digestive tract is divided into three parts: the foregut, mid gut, and hindgut. [5][6]. In all animals the alimentary canal is considered tube began from the mouth hollow to the anal canal. The tubular parts of the gastrointestinal tract include the esophagus, gastric, small intestine parts and large intestine parts, which are likely spaces that enlarge to accommodate consumed materials. All parts of the digestive system have smooth muscle fibers in their walls which help in digestion process and push ingesta from stomach to the intestine, the dimension of the digestive system differs among types with the shortest tracts occurring in carnivores animals and the longest most complex tracts in herbivores animals [7].

2. Materials and methods

Twelve adult rabbit good health condition will be collected by hunting and cage in the animal house in the department of biology at the College of education of pure science /University of wasit keep this animals under observation for seven days then euthanized by intra-muscular injection of an overdose mixture of ketamine and xylazine. The representative specimens of one cm were cut from stomach, the specimens stomach were rinse with cold normal saline and then directly soaked in 10% neutral buffered formalin for 48 hour Specimens were processed by routine histological process then 6 μ m paraffin sections were obtained by using rotary microtome [9]. The specimens were stained with Harris's Hematoxylin and eosin stain for general structure histological of stomach and periodic acid schiff stain for the fundic glands detection [10].

3. Results

The mucous membrane lining the stomach contain gastric glands this glands position in three regions of stomach ,cardiac ,fundic and pyloric region the great region in stomach it fundic region most the digestive process occur in it. the histological feature of this area appear consist from four layers; mucosa, sub mucosa, muscularis and serosa layer (Fig1). The epithelium lining fundic region simple columnar epithelial ,the glands in this region were appear long, straight, tubular in shape, aligned almost parallel to the muscularis mucosa layer, and at their bases, a glandular spiral structure characteristic of glands was observed in the cross-section of the gland (Fig.2). In this region there are several types of cells observed, mucous cells ,chief cells , parietal cells and enteroendocrine cells (Fig3). The gastric pits and mucous cells of fundic region contain neutral mucopolysaccharides when staining with periodic acid Schiff stain given positively result to this stain (magenta color) (Fig2).



Figure(1)show the fundic region of stomach: Tunica mucosa(TM),Muscularis mucosa(Mm),Tunica submucosa (TS), Tunica muscularis (TM),.PAS stain.X100

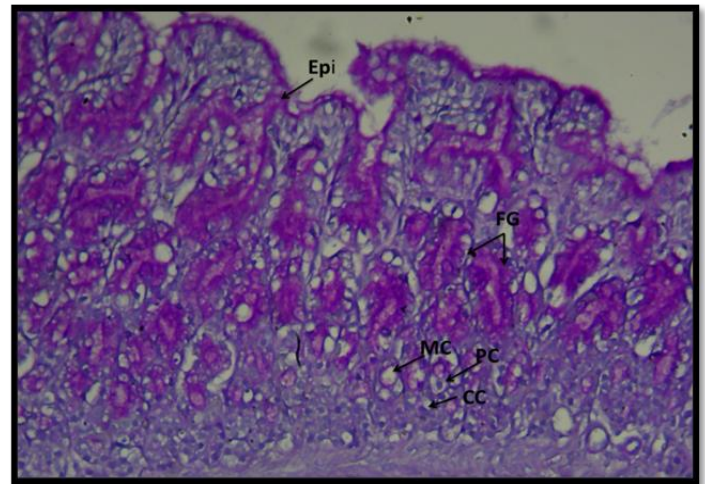
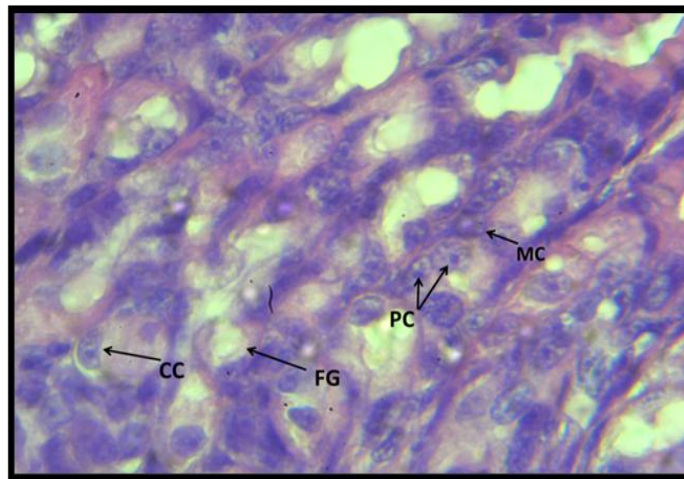


Figure 2:Micrograph of the fundic region of stomach shows: fundic gland (FG),epithelial lining the surface of mucosa(Epi),Mucous cell(MC),Parietal cell(PC),Chief cell(CC). X100 PAS stain.



Figure(3)show the fundic region of stomach:Mucous cell(MC),Parietal cell (PC),Chief cell (CC), Fundic gland (FG),H&E stain.X400.

4. Discussion

Serial tissue sections revealed a region between the cardiac region and pylorus region that exhibited a typical glandular distribution pattern, distinct from the areas at both ends. These glands were long, straight, tubular in shape, aligned almost parallel to the muscularis mucosa layer, and at their bases, a glandular spiral structure characteristic of glands was observed in the cross-section of the gland, this observations corresponding with [11][12] in rabbits [13][5] in guinea pig and[14] in albino rat. Besides mucus-secreting cells, the main cell kind notes were parietal cells and chief cells. As we approached the neck of the gastric gland, the mucus cells were mixed with parietal cells. Parietal cells were scattered throughout the entire length of the gland, but were most abundant in the upper third of the gland. In the lower two-thirds region, the number of cells was small and they were located in the periphery of the gland, but the frequency of parietal cells was lower than that of chief cells, this result like observations were reported by[15][5]. Parietal cells were the largest and most pleomorphic, existing either individually or along the periphery of the gland, possessing a spherical nucleus at its centre and highly eosinophilic granular cytoplasm. The base of the

cell bulged outward from the outer surface of the gland, this result corresponding with [16] mention in some domestic animals. Author the [14] also in albino rats mention the parietal cells were pyramidal shape and large cell kind in stomach glands. In contrast, chief cells were abundant in the lower two-thirds of the gastric fundic gland region and were interspersed with parietal cells, appear pyramidal in shape, with a spherical nucleus at the base, and the cytoplasm showed strong basophilic. The region between the nucleus and the free apical surface may be vacuolated or transparent and may be filled with zymogen granules this result corresponding with [17][18] also stated that in rabbit the lower three-quarters of the lamina propria of stomach consisted predominantly of chief cells. The mucopolysaccharides substances in fundic region had vital roles in the growth of the epithelial cells and act as barrier against the acid secretion from gastric glands this results similar with [19][20].

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