

J. STACHURA, K. GAŁĄZKA

HISTORY AND CURRENT STATUS OF POLISH GASTROENTEROLOGICAL PATHOLOGY

Chair and Department of Clinical and Experimental Pathomorphology,
Jagiellonian University Medical College, Cracow, Poland

The present paper summarizes the contribution of Polish investigators to the development of gastroenterology, and especially pathology of the gastrointestinal tract. We called to mind meritorius scientists among the 19th-century and modern pathologists. Especially interesting are discoveries of Browicz, being the first, who described typhus bacilli and shortly after Kupffer - fagocytosing cells in the liver. Noteworthy are detailed description of tumorous lesions being the contribution to oncological pathology of the gastrointestinal tract as well as the reports on congenital malformations (i.e. esophageal fistulas). Moreover we remind the investigators dealing with pathology of gastric ulcer disease, its pathogenesis and mechanisms of healing. Of great importance was also the discovery of regeneration existing also outside the mucosal surfaces. In the paper, besides the above-mentioned Tadeusz Browicz investigations of professors: Leśniowski, Ciechanowski, Kowalczykowska, Stachura, Konturek are called to mind.

Key words: gastroenterology, history of medicine, pathology, gastrointestinal tract, Kupffer cells cytoprotection

INTRODUCTION

The path leading to the discovery of infectious pathogens was most often long and laborious and the contribution of some scientists to this cause was undeservedly disregarded. No recognition was granted to Tadeusz Browicz, who was the first to discover *Salmonella typhi* and whose report entitled “Vegetable parasites in typhoid fever” was published in 1874, six years earlier than the first edition of Eberth’s treatise and 10 years prior to Gaffky’s publication of his

results. Yet the two latter names are the only ones used in describing *Salmonella typhi*, and the discovery of the bacterium is improperly ascribed to the above investigators. (1, 2) Tadeusz Browicz thoroughly described pathological changes occurring in various organs - including the intestines - in the course of typhoid fever: "Situated above several Peyer's patches and isolated glands, there is a thin, yellowish necrotizing layer, which can be separated only at some places. The mesenteric glands are the size of a hazelnut, congested and juicy". Microscopically, Browicz observed immobile structures within the cardiac muscle and kidneys, which were "shaped as short rods". The discovery of their presence inspired him to start a simple culture (rod-containing preparations were placed in a humid chamber), where he noted, that "these creatures reproduced". His scholarly inquisitiveness made Browicz perform follow-up experiments aiming at checking whether corpses of other patients who had died for reasons other than typhoid fever contained similar microbes. His results confirmed his conviction that the "short, rod-shaped creatures" he discovered constituted typhoid fever germs. In addition, he found such bacteria in the stool of patients hospitalized for typhoid fever. Yet the report Tadeusz Browicz published is suffused with modesty and humility characteristic of a true scientist: "Whether these creatures, described in other diseases (...) as "Bacterium termo", are the real cause of the aforementioned disease, it is impossible to decide based on an isolated case. (...) Further investigations leading in this direction may explain whether there is an association between diseases and parasites and what such an association might be (...)". It should be added here that the text had been written before Pasteur and Koch published their results, what constituted the beginning of the era of bacteriology, and that similar investigations and observations were later presented by Eberth and Gaffky, although their methodology was extended.

Also Antoni Leśniowski, a surgeon, is very often left unmentioned when *ileitis terminalis*, an inflammatory intestinal disease, is discussed. Yet it was the very Polish scholar who was the first investigator to draw attention to the separate character of granulomatous inflammation of the terminal ileum accompanied by fissure-like ulceration (3, 4). In 1904, he described a patient with ileitis terminalis and inflammatory lesions of the adjacent colon, presenting his observations at a meeting of the Warsaw Medical Society and later publishing them in 1909, that is 23 years before the publications of results achieved by the American physician B.B. Crohn, whom Western literature on the subject regards as the only author of the first description of the condition, which since that time bears the name of Crohn's disease.

To explain phenomena associated with various diseases, one needs to possess knowledge of the appearance and true nature of normal cells. This is true, for example, in the case of Kupffer's cells. Tadeusz Browicz observed these cells, described them immediately after Kupffer did and pointed to their phagocyte nature (although he did not believe them to be chromogenic cells) in his report written in 1898: "In longitudinal sections of capillary vessels (...) large,

longitudinal cells are seen situated on the internal surface of the capillary (...). These cells protrude, at times considerably, into the capillary. (...) These intravascular cells are characterized by their large size and longitudinal shape. Their nuclei are longitudinal, vesicular and often somewhat plicated (...). These intravascular cells very often contain leukocytes, red blood cells, vacuoles and pigment deposits” (5).

Pathogenesis of peptic ulcer and appendicitis

We cannot overlook the fact that it was Tadeusz Browicz who, in his paper entitled “The development of peptic ulcer and appendicitis” drew the attention of scholars to the complex pathogenesis of these common the equally as today diseases” (6), stating there that:“(...) the origin of peptic ulcer is not based on a single factor, (...) the anatomy of the stomach, its topography, its normal or pathological status, the effects associated with chemical, thermal, mechanical, traumatic, microbial (although, if of the latter nature, they are very rare) and nervous system-associated agents play a role here; nevertheless, functional abnormalities, such as gastric paresis and gastric contents retention, gastric hyperacidity, (...) the state of the organism are not without their effect on the development and healing of peptic ulcers (...)”. The author also emphasized the multitude of causes of appendicitis, drawing attention also to the possible parasitic background underlying the condition: “The ability to create the portal of entry for an infection cannot be denied to some parasites, which are almost constantly present in the cecum in its broad sense, i.e. including the paracecal part of the colon, such as trichocephalus and oxyuris vermicularis - organisms that are also encountered in the appendix and whose penetration into the mucosa, thus forming a small wound, is seen under the microscope”.

Infectious granulomatous inflammations

The observations and descriptions of lesions occurring the in the course of infectious diseases have contributed to the extension of our knowledge on such conditions. The thoroughness and reliability of pathologists while describing such lesions and attempting to find a logical explanation deserve our admiration. Janina Kowalczykowa described a rare type of isolated tuberculous lesions in the liver and spleen concomitant with the development of larger foci undergoing caseous degeneration and surrounding bile ducts; she also provided a detailed explanation of the possible pathway of their development (7). Two other rare cases of the so-called “pericholangitis tuberculosa” were reported by Stanisław Białek, who probed into the issue of their origin and differential diagnosis (8). Tuberculosis was of special significance in those times, when it was a very common disease and often had a generalized course. Here we should emphasize the very detailed methodology of differentiating between caseous necrosis and gummas, which was presented by Dr. Białek, who employed simple staining

methods that are sinking into obscurity in the era of immunohistochemistry and molecular studies, but are so useful and easy to interpret.

Gastrointestinal oncology

A great contribution to the development of the gastrointestinal oncological pathology was made by the descriptions of tumors, characterized by striking meticulous care and inquisitiveness exhibited by their authors. What is also striking here is their splendid knowledge of histopathology, which allowed for defining the character of a lesion without resorting to sophisticated staining methods, as well as their presenting an extensive differential diagnostic management, indicating the scrupulosity of pathologists, as in the case of descriptions of pancreatic cystic adenoma prepared by Dr. Skibniewski: “Microscopically, the cysts are found to be layered with epithelium of various height, starting from squamous epithelium, resembling endothelium, to pavement epithelium situated on the cyst walls; the walls themselves are composed of connective tissue (...)”, as well as by Dr. Schloengvogt (both were Assistants to Professor Ciechanowski): “Our case is basically different from cases of dysontogenetic cystic pancreatitis. First of all, no other organ has demonstrated any developmental abnormalities. In addition, the radial and concentric arrangement of the cysts around a single site, which might be regarded the center of the tumor, as well as the gradual narrowing of connective tissue septa, what might indicate the mass’s centrifugal growth and origin from a single bud, the sharp border between the tumor and the surrounding pancreatic parenchyma, (...) as well as the uniform character of the epithelium allow for classifying the above described tumor as a true neoplasm, while in view of the encapsulation of the mass and the absence of metastases it can be deemed a benign tumor, (...)” (9, 10). Pathological lesions of the pancreas that might clinically suggest a tumor, were reported by Paweł Hornicki (11), who described a rare type of a pancreatic cyst in his paper entitled “A case of a cyst of the pancreatic duct”. A detailed macroscopic description of the lesion, supplemented by a schematic drawing, is worthy of our attention: “The walls of the cyst were 2 to 5mm thick. Its internal surface was entirely smooth. Inside the cyst, on the caudal side of the pancreas, there protruded a segment of the pancreatic duct, several millimeters in length”. Of similar interest is the microscopic description and the explanation of the etiopathogenesis of the lesion with references to the literature on cystic lesions involving the pancreas.

Esophageal myomas, along with their macroscopic features and degenerative changes, were described by Adam Syrek, Assistant to Professor Ciechanowski (12). We are indebted to Paweł Hornicki, another Assistant of Professor Ciechanowski, for his detailed report on gastrointestinal myomas, especially those situated in the small intestine, where we can find a clinical and pathological characterization of these rare tumors (13).

An extensive work by Marian Wodziński, devoted to primary intestinal myomas, also originated in the Department of Pathological Anatomy, Jagiellonian University (14). Here we find descriptions of various types of these tumors and - despite differences in terminology - we can see that macroscopic and microscopic properties, as well as classification of these neoplasms into particular types (lymphatic, round cell, and connective tissue myomas, divided into spindle cell and myoblastic tumors), do not principally depart from contemporary views. An additional valuable observation in Wodziński's report is the indication of differences in the distribution of argentophilic fibers in various myoma types. The author gave a very thorough description of particular cases along with pertaining clinical data - this is why even today his paper may constitute a source of information on clinical presentation and histopathology of primary intestinal myomas. Dr. Gliński, in turn, in his paper entitled "On polypous mixed type esophageal tumors" concentrated on non-epithelial tumors of the esophagus and their possible polypous morphology" (15).

"On primary sarcomas of the liver" is a report prepared by Dr. Jan Romanowski (16). In addition to detailed descriptions of these rare malignancies, the reader shall find here remarks that are helpful in the difficult process of differentiating between the clinical presentation of sarcomas of the liver and carcinomas involving the same organ: "The differential diagnosis of a sarcoma and a carcinoma (...) may be of some importance only in view of the prognosis. A young age of the patient and a high rate of tumor growth would indicate a sarcoma".

A description of polypous intestinal lesions that stresses the appearance of various polyp types (other than neoplastic), the possibility of their multiple occurrence, the clinical-pathological correlation and the risk of tumor development can be found in the paper written by a surgeon Stanisław Nowicki (17). The report was prepared in collaboration with the Department of Pathological Anatomy, Jagiellonian University, headed by Professor Ciechanowski.

Scientists representing the Department of Pathological Anatomy of the Warsaw University authored communications on connective tissue tumors of the stomach, which are rare even today (18). A primary sarcoma was presented by Dr. Dobijowa. Even in contemporary literature it is hard to find such a precise characterization of an angiosarcoma of the stomach as the one presented by Zdzisław Michalski in his report entitled "A primary angiosarcoma of the stomach" (19).

Tumors of the lymphatic tissue, virtually unknown at the beginning of the 20th century, constituted the subject of investigations carried out by Dr. Gliński (20), who described the way a lymphoma of the colon grew and disseminated locally; Professor Ciechanowski is credited for his descriptions of unique cases of primary Hodgkin's disease involving the intestines (21).

Rare lesions of the intestines

We are indebted for our knowledge on rare pathological lesions to individuals who described such abnormalities and - what is more important - who attempted to explain their etiopathogenesis. Professor Ciechanowski and his Assistant Dr. Skibniewski presented a detailed analysis of the problem of “vesicular intestinal emphysema”, emphasizing the diversified distribution of gaseous cysts in the mucous membrane and explaining the appearance of giant cells: “(...) gas bubbles collect not only within lymphatic or blood vessels, as some authors believe, but also (...) in fissures (of accidental origin) in the tissue, otherwise the layer of elastic fibers would not be interrupted by gas (...). (...) in such cases some specific conditions prevail in the tissue that interfere with gas being sucked in; in consequence the tissue acts similarly as it would in case of foreign bodies, which are hard to be absorbed, i.e. it forms giant cells” (22).

Congenital malformations

Aleksander Bossowski, a surgeon, contributed to the body of knowledge on congenital small intestine atresia, propagating among participants in the 12th Surgical Congress held in Cracow in 1903 his expertise and modest (in view of the rare character of the defect) experience on the types and therapeutic management of this condition (23). The interest in congenital defects was reflected in the work of Professor Ciechanowski and Leon Konrad Gliński, who also investigated intestinal atresia, stressing various causes of this condition: “(...) various causes may give rise to intestinal atresia, and oftentimes similar anatomical presentations of intestinal atresia may develop in consequence of various causes”. The authors took the opportunity to dispose of the then prevailing view, stating that intestinal atresia was caused by primary peritonitis in fetal life: “(...) at the first glance this case seemed to confirm the ever-present view that one of the most common causes of intestinal atresia was fetal primary peritonitis; whereas a more thorough examination indicated without any doubt that in this instance (and most likely in many others as well) peritonitis was secondary, while the primary cause was serpentine intestinal torsion, which of itself resulted in peritonitis with secondary intestinal atresia” (24). The authors also described congenital esophago-esophageal fistulas, providing a thorough characterization of structural abnormalities of the esophageal wall and an explanation of the development of such a defect: “(...) we ascribe the development of the above mentioned canals, or, as we call them, esophago-esophageal fistulas, to an incomplete closure of a through-shaped protrusion situated on the anterior esophageal wall, which gives origin to the subsequent respiratory organ, and to a partial separation of this protrusion in the esophageal wall by the developing muscular layer of the mucosa” (25). It should be emphasized that the first case of such an abnormality was reported by Ciechanowski in 1899, six years before Happich published his monograph on

congenital abnormalities of the esophagus. Dr. Gliński contributed to explaining the development of congenital pancreatic defects, and especially to ectopic pancreas, discussing the issue based on a description of a patient in his report entitled “A case of accessory pancreas situated in the stomach wall. On congenital defects of the pancreas in general” (26).

Experimental pathology

Some experimental papers are worthy mentioning, such as the investigations of Antoni Franus carried out in white mice and rabbits in order to determine the causes, dynamic patterns of development and distribution of lesions indicative of fatty degeneration of the liver (27). His results allowed Dr. Franus to formulate the following conclusions: “Fat starts to accumulate in the hepatic lobule first in the peripheral part, subsequently it gradually involves the median layer to finally penetrate into the central part of the lobule; the phenomenon can be explained by the specifics of circulation”. Henryk Stanisław Taper, supervised by Professor Kowalczykova, investigated precancerous lesions of the liver; he based his investigations on mice whose diet was supplemented with a carcinogenic agent (28). The author observed lesions that might have corresponded to dysplasia: “The size of the nuclei was becoming more and more diversified. Here and there I encountered giant nuclei with vesicular structure”. Since he failed to induce cancer in his laboratory animals despite the observed lesions (“they resemble lesions that develop in chronic hepatic cell damage”), Taper formulated a significant conclusion that the diet he employed might have contained some anticancer factor.

Hepatic tumors constituted the subject matter of an interesting paper written by Professor Ciechanowski and entitled “Secretory properties in primary adenoma and adenoid carcinoma of the liver cells” (29). What was important in the above report was the fact that the author emphasized the functional similarity between neoplastic cells and hepatocytes: “(...) intracellular, morphological manifestations of cellular secretory activity, especially associated with bile pigments, persist in adenoma and hepatic adenoid carcinoma cells for a relatively very long time, despite the fact that these cells very markedly deviate from the mother cell type; these manifestations fail to be explicitly demonstrated only when neoplastic cells have reached the lowest level in morphological anaplasia.”

The issue of necrosis involving the central part of hepatic lobules was studied by Professor Ciechanowski, who concluded that “It is impossible to determine a single cause leading to such necrotic lesions, since they may develop both in diseases, where a toxic agent is present within the body, and in cases of hypostatic hepatic congestion, where no perceptible toxic agent can be detected. (...) Hypostatic hepatic congestion does not always lead to necrotic lesions involving the central part of hepatic lobules, as in some percentage of cases we observe only the loss of hepatic trabeculae without any signs of necrosis. Hypoxemia alone

cannot be a sufficient reason for necrosis involving the central parts of hepatic lobules” (30).

An original discovery of Polish gastroenterologists was the demonstration of cytoprotection occurring in the liver (31 - 36). It was the first observation of cytoprotection as a phenomenon taking place anywhere else but in the gastric and intestinal mucosa and being not necessarily associated with gastric juice secretion.

Similarly, of great importance was gaining the understanding of the mechanism of healing the ulceration of gastric mucosa, as well as demonstrating the role of growth factors in this process (37 - 44).

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Author's address: Prof. J. Stachura, Chair and Department of Clinical and Experimental Pathomorphology, Jagiellonian University Medical College, 16 Grzegorzeczka St., 31-531 Cracow, Poland. Tel. (48-12) 4211564; fax (48-12) 4215210
E-mail: mpstachu@cyf-kr.edu.pl