

REVIEW

By Prof. Dr. Radoslav Nenkov Gaidarski DSc for Assoc. Prof. Dr. Plamen Milchev
Chernopolsky PhD,

for the procedure for obtaining the scientific degree - "DOCTOR OF MEDICAL SCIENCES" in
the specialty of SURGERY.

Subject of the dissertation -

"INTRAABDOMINAL ABSCESSSES", in the field of higher education 7. Health and
Sport. Professional field - 7.1 Medicine, specialty - SURGERY.

The dissertation covers 372 standard pages, divided into 14 sections.: INTRODUCTION - 3 pages; 2. DEFINITION AND CLASSIFICATION - 3 p.; 3. RISK FACTORS - 3 p.; 4. MICROBIAL CAUSES - 2 p.; 5. MECHANISM OF INITIATION AND DISPERSION - 5 p.; 6. LITERATURE REVIEW - 53 p.; 7. AIM AND OBJECTIVES - 1 p.; 8. MATERIAL AND METHODS - 20 p.; Divided by area: ABCESSSES - 172 p.; 9. DISCUSSION OF THE MATERIAL AND METHODS - 50 p.; 10 - ALGORITHM IN INTRA-ABDOMINAL ABSESES -1 p.; 11. CONCLUSIONS - 2 p.; 12. CONTRIBUTIONS; 13. PUBLICATIONS RELATED TO DISSERTATION - 3 p.; 14. LITERARY SOURCES - 41 p.

In the first section "INTRODUCTION", Assoc. prof. Chernopolsky presents the great socio-economic importance and the necessary health resources for the treatment and recovery processes of intra-abdominal abscesses. In a multicenter study conducted in 132 hospitals, involving 4553 patients, over a period of 4 months, the overall mortality was 9.2% (2015 г.). Prior to the "LITERATURE REVIEW," the following are presented "CLASSIFICATION" of intra-abdominal abscesses, "RISK FACTORS", "MICROBIAL CAUSES", and "MECHANISM OF INITIATION AND DISSEMINATION" of intra-abdominal abscesses. "THE LITERATURE REVIEW" - 53 pages, sequentially traces the development of medical science in Mesopotamia. King Hammurabi's medical code states that "if a doctor has treated a man with severe wound with a bronze instrument and the man dies, his hands must be cut off". Excerpts in papyri of

ancient Egypt are quoted "in case of hopelessness, the sick be left to his fate". At a later stage in India there are written records of exact instructions for incision of abscesses in different parts of the body. In China, the surgeon Nia To was opened the abdomen, washed it and removed the abscess and excess necrotic tissue around it. Ancient Greek medical culture, is presented in detail, in the person of HYPOCRATES (470-400), with the famous Hippocratic facies of patients with sepsis and severe general condition, and the scientific developments of the ingenious scientist and physician Celsius, who bequeathed us the four basic signs of inflammation: PAIN, HEAT, SWELLING, and FLUSHING, with a fifth sign later described by GALEN - loss of function. The significant regression of medical science and education is also noted, especially in the field of surgery and anatomy of the human body, due to a number of church canons and divine prejudices of the time. The significant progress of medical science during the time of the Renaissance, despite the existing church canons and even physical threats is described. Consistently described are the merits of personalities such as Louis Pasteur, Lister, Thomas Anderson, Johann Mikulicz, etc.

In the section "LITERATURE REVIEW" - 44 pages, from pages 26-70, the groups of diseases in which abscess formation is possible are separated, and a space is allocated for each disease entity in turn, starting with: acute appendicitis, liver and perivesical abscess, diseases of the stomach and duodenum, pancreatic abscess, subphrenic abscess, diverticulitis of colon. The section also describes "HISTORY OF DRAINAGE AND LAVAGE," "ANTIMICROBIAL REMEDIES," and "MODERN GUIDELINES". The next section is dedicated to the "MAIN AIM" - "To study, analyze and standardize the diagnostic, preoperative approach and treatment of intra-abdominal abscesses in order to optimize treatment outcome, reduce complications and achieve a better quality of life". To achieve the main AIM, 5 OBJECTIVES have been set, which in the following statements successively are analysed, discussed and relevant conclusions drawn. In the "MATERIAL AND METHODS" section, for the period 2011-2020, in the Department of SURGERY (Second Surgery) are 555 patients with proven intra-abdominal abscess, which were hospitalized, divided into 10 groups, detailed by respective abdominal regions and corresponding organs within them. Noteworthy is the first group "Liver and perivesical abscesses" - 207 cases and 7 and 8 cases of splenic abscesses and ulcer disease. The DIAGNOSTIC METHODS used are described in detail and divided into 5 main groups, and the hospitalized patients certified by GENDER and AGE. From the materials sent for microbiological testing, over 30 species of

microbes were isolated proving the large diversity of the microbial flora in different types of abscesses and the difficulties in selection of appropriate antibiotic and surgical approach. An attempt has been made for classification of the most common symptoms in abscesses, which do not differ from those already described and known in the surgical literature.

For all patients, there were 1144 IMAGING STUDIES recorded, of which ULTRASONOGRAPHY and CT scan methods were the most frequently used, in 460 and 337 patients, respectively. In the dissertation, the efforts are made to describe the CONCOMITANT DISEASES in each patient and their extremely large number - 833 disease units with 395 complications.

The following sections describe the different areas in which the individual INTRAABDOMINAL ABSCESSSES are most often formed, with the first place being given to the most frequent LIVER and PERIVESICAL ABSCESSSES - 207 patients with a proven mean age of over 63 years in men and women, with the most common cause, in over 40-60% of cases, being biliary tract diseases. The preferred drainage in the treatment of patients was external, over surgical interventions. But the latter had fewer reasons for secondary interventions and shorter postoperative hospital stay. The mortality rate in the group was 5.3% - 11 patients died, all with multiple comorbidities, in old age. Only one was under 60 years of age. A second large group was - PERIAPENDICULAR ABSCESSSES - 142 patients with a mean age of 16-89 years, a ratio of 1.78 to 1 male/female, i.e., twice as many males as females had complications of appendicitis. 2 elderly patients died. In the clinic, surgical removal of the appendix with evacuation of the abscess was the preferred method. Laparoscopic appendectomy according to literature data, (op. cit. 239.280) was associated with a greater chance of developing intra-abdominal abscesses in a ratio of (9.0%-2.6%). Third group - PANCREATIC GLAND ABSCESSSES. In this dissertation, the literature is discussed regarding the definition of PANCREATIC ABSCESS - INFECTED PANCREATIC PSEUDOCYSTS and INFECTED PANCREATIC NECROSIS. Distinguishing these 3 distinct forms is critical to the treatment and outcome of complications. The opinion is strongly supported. PANCREATIC ABSCESS is a distinct form of the disease from the other 2 forms. According to literature, abscess develops in 1 to 5% after acute pancreatitis and its improper treatment leads to fatal outcome. Of the 63 patients treated in the clinic, 42 men and 23 women, mean age 31-89 years, 14 patients died - 21.5%. The efforts made in the treatment of the group of patients with pancreatic abscess, a combination of modern antibiotics after proven microbial flora, infusions of

pancreatic-appropriate medications, drains, and relaparotomies are described in detail in the dissertation. An interesting group is represented by the origin "SMALL AND LARGE BOWEL" patients - 51 patients, 28 men and 23 women, mean age 25 - 81 years. Deceased - 15 pts (29.4%) - the highest % of deceased patients among the other groups, the diseases causing the development of the individual abscesses in the group are detailed in a separate table - Crohn's disease, Sigma cancer, Cecum, Rectum etc. Of note is the fact that in 5 patients, nearly 10% had no microbial causative organisms detected - sterile cultures, raising doubts in the material sent for culture and microbiological examination. Here again, as in the other groups of abscesses, the approaches and treatment modalities are described in detail and very precisely - resections, abdominal wall stomas, powerful antibiotic therapy. In a separate table the accompanying diseases are presented. Almost all patients had hypertension, rhythm disturbances, chronic heart failure, etc. complications, prominently presented in a table, in the scientific work.

The group "POSTOPERATIVE ABSCESSSES" is of particular interest due to the fact that they are a consequence of various surgical interventions and are most often due to inexperienced actions of the operator, improper postoperative treatment, incorrect surgical technique and less often accompanying disease changes or impaired immunity. In the period under discussion (2011-2020), 41 patients were treated in the clinic, 17 men and 24 women, mean age 21-85 years, 3 patients died. The causes of postoperative complications, diagnosis, treatment measures and especially the reasons for their formation in the postoperative period are presented and detailed in the table. Due to the particular nature, mode of occurrence and formation of "ABSCESSSES OF DIVERTICULOSIS" are placed in a separate group, comprising 21 patients -10 men and 11 women with an average age of 28 - 82 years. According to the literature, about 313,000 patients are treated annually for diverticular bowel formations in the United States with over 50,000 bowel resections at an annual cost of about \$2 billion, representing 5.5% of the annual general surgery budget for the treatment of patients. In this section as well as in the above sections, the dissertation describes in detail the difficulties in the diagnosis of the abscesses, the treatment modalities, and emphasizes in detail the possibilities of drainage procedures and antibiotic treatment over surgical interventions according to literature data. The personal material shows exactly the opposite of the above statement, of the 21 patients treated, 19 underwent various surgical interventions, mostly Hartmann resections (15 cases) and only 4 patients had drainage and antibiotic therapy, i.e. in the literature it is one thing, but in practice it is quite another. "Read

and learn from the literature, but do not underestimate practice and experience." A relatively rare disease is the group "ABSCESSSES AFTER GASTRO-DUODENAL PERFORATIONS". There were 8 patients treated in the clinic, 5 males and 3 females, mean age 37-87 years with a mean hospital stay of more than 20 days, 4 patients died (50% mortality). In the only randomized trial published so far (according to the dissertation) by Croft et al. on 83 patients with perforation and abscess, the lethality in early operated patients and non-operated patients did not differ in percentage 4.77% vs. 5.0%, but with longer stay, more than 37% for non-operated patients. Again based on literature data, the surgical approach was defined in 4 groups, depending on 3 independent risk factors (Boey), and performing laparoscopic intervention without surgical intervention was recommended in cases with 0 or 1 Boey score. In this group, the dissertator claims that they did not have a single patient, therefore they adhered to the gold standard of open surgery. ABSCESSSES OF SPLEEN though a rare disease pose a great danger to the lives of the patients and often end in death. In this dissertation 7 patients with a mean age of 44-62 years, 4 males and 3 females are discussed. The preferred method of management in all patients was surgical removal of the spleen and subsequent antibiotic treatment. There were no deceased patients in the group.

The last section in the group of abscesses is placed "ABSCESSSES OF GYNECOLOGICAL ORIGIN", probably because they are located in the abdominal cavity, although they are the subject of another surgical discipline, but are often the subject of interventions in surgical wards and clinical units. A group of 13 female patients were the subject of treatment in Second Department of surgery. The dissertator emphasize on the extreme importance for the outcome of the disease - the readiness of the clinic to treat such patients, the experience of the operator and the decision-making team to perform a simple drainage to complete removal of the affected organs in the woman's pelvis.

The "DISCUSSION" section highlights that significant progress has been made in recent years in our understanding of the PATHOGENESIS AND MICROBIOLOGY OF INTRA-ABDOMINAL ABSCESSSES. Progress has been made in the diagnosis and treatment of these diseases. Particular importance has been attached to ultrasound and CT scanning, which have simplified the diagnosis of abscesses and created the possibility of non-operative intervention in certain strictly indicated cases. In a further presentation, the dissertation emphasizes that for the proper management of abdominal abscesses, knowledge of the three forms of body defense:

LYMPHATIC CLEARANCE, PHAGOCYTOSIS, AND FIBRIN SEQUESTRATION, with a subsequent description of the mechanism by which the abscess may form, or the 3 factors mentioned will not allow its development and infection as such. All three factors help control the development of generalized peritonitis but promote the development of intra-abdominal abscesses (DUNN D.I.). The actions of these factors are described in detail in the section, with particular emphasis on so-called "SOURCE CONTROL", a term encompassing all actions taken in the course of treatment to control the focus of infection and reduce conditions that promote the growth of microorganisms (John Mazuski et al. 2018). It is believed that the high lethality in the early 20th century, which was over 90% after the introduction of the basic principles of Kishner et al.: 1. Elimination of the septic foci; 2. Elimination of necrotic tissue; 3. Drainage of purulent exudate - total lethality hovers below 20%. The basic principles of SOURCE CONTROL OF INFECTION are described in detail: DRAINAGE, DEBRIDMAN, RESTORATION OF ANATOMIC FUNCTIONS, and TIME FOR SOURCE CONTROL in the range of 7-22 hours.

Particular attention is paid to the ADEQUACY of the controls. In the "DISCUSSION" section, the main points for the formation and development of intra-abdominal abscesses are again analyzed, but in greater detail, such as: "MICROBIAL CAUSES", for which anaerobic bacteria are said to occur 1000 times more frequently than aerobic ones. In the clinic's own series, 41 species of microbial causative agents were recorded, while no bacterial strains were found in 189 cases of these.

"IMAGE STUDIES" - ULTRASONOGRAPHY, COMPUTER TOMOGRAPHY, MAGNETIC RESONANCE IMAGING reiterate data from previous sections of the thesis, with particular attention to ultrasonography applied in 460 patients (82.9%) and CT scan in 337 patients (60.7%). The higher sensitivity of CT over ultrasonography is emphasized. Magnetic resonance imaging was used significantly less frequently in 20 patients (3.6%).

Significant space in the section is devoted to the "LAPAROSCOPIC METHOD" and intra-abdominal infection, as in the personal material, was applied in 19 patients (3.42%) and "PERCUTANEOUS DRAINAGE", performed in 58 patients (10.5%) according to literature data, success rate of 30-80% (Politano et al.). In separate subsections, the problems of RELAPAROTOMY are discussed - 16 cases, 12 of them in elective patients and 4 in emergency patients. POSTOPERATIVE LAVAGE, according to the dissertator, is still a debated issue in the surgical literature. Fifteen pages are devoted to the principles of ANTIBIOTIC

TREATMENT of abdominal infections and more particularly to their application to intra-abdominal abscesses. In the process of treatment of the discussed patients, Assoc. prof. Chernopolsky writes that 3 basic principles were followed: 1. Avoiding inappropriate use; 2. For mild to moderate infections - cephalosporins, ampicillins, etc. in combination with metronidazole; 3. For more severe infections - meronem, imipenem, tazobactam, in combination with metronidazole, reporting a serious danger of development of resistant strains in case of improperly conducted complex treatment against the microbial causative agent and hence to failure of the whole complex of treatment measures.

The 8 "CONCLUSIONS" presented are very well formulated, justified by the analysis and discussion of the material in the dissertation. They reflect the personal views of the dissertator, coinciding with the data of authors from leading schools in our country and abroad. I fully accept the proposed 5 "CONTRIBUTIONS", and I would personally add a 6th one - "For the first time in our surgical literature, an extremely thorough literature and practical analysis of INTRAABDOMINAL ABSCESSSES is made, tracing their etiology, pathogenesis, diagnosis, clinic and treatment.

CONCLUSION

The dissertation covers a length of 372 standard pages with separate sections treating the individual issues in the dissertation. In the first place, the enormous number of patients, 555, over a period of 10 years should be noted, which allows for statistical reliability of the material discussed. Extensive literature review - 53 pages. Some of the most famous authors and schools are quoted, mostly from abroad. The MAIN AIM AND OBJECTIVES are very well formulated and strictly adhered to in the exposition of the material. THE MATERIAL AND METHODS of research and proof are consistently described, based on the material it possesses and the literature sources it uses. An extensive DISCUSSION is presented - 50 pages - which can stand alone as a dissertation. Besides the dissertation, Assoc. prof. Chernopolsky participated in 10 scientific publications on intra-abdominal abscesses, both in our and foreign scientific forums. He has defended a dissertation scientific work, after which he was elected as Associate Professor - 50 pts. Scientific publications at home and abroad - 105 pts. Scientific metrics for the position of ASSOCIATE PROFESSOR - 105 pts. He participates in active scientific profiles such as Scopus Author ID, ORCID, Google Scholar and ResearchGate.

In conclusion, I propose to the members of the esteemed jury to unanimously award the degree of Doctor of Medical Sciences to Assoc. Prof. Plamen Milchev Chernopolsky PhD, in the field of higher education - 7. Health and Sport, professional field 7.1 - Medicine, specialty - Surgery.

08.12.2023

Prof. Dr. Radoslav Nenkov Gaidarski DSc

