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THE CHARACTER OF PURULENT-INFLAMMATORY DISEASES OF THE RETROPERITONEAL SPACE

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Abstract

A review of 439 inpatient records from the purulent surgery department at the Tashkent Medical Academy's multidisciplinary clinic, spanning from 2010 to 2022, was performed to identify a cohort for observation. Prior to initiating treatment, all patients underwent both MSCT and ultrasound of the retroperitoneal space, in addition to standard clinical laboratory assessments, to guide surgical decisions. The imaging revealed a localized purulent collection (abscess) in 28.7% of instances, phlegmonous changes in 51.4%, and a combination of these or post-surgical fistulas in 19.9%.

INTRODUCTION:

Purulent-inflammatory conditions affecting the retroperitoneal area are defined by the progression of pus-forming, destructive processes, manifesting through distinct clinical and laboratory indicators. This category encompasses various purulent conditions such as purulent paranephritis, renal abscesses and carbuncles, infected renal cysts and hematomas, paranephritis, and anaerobic phlegmon [1,10]. Key contributors to the emergence of this pathology are often attributed to therapeutic misjudgments, delayed diagnosis of underlying renal disease, and insufficient cleansing during initial surgical interventions. While E. coli is a primary culprit in acute pyelonephritis, the more severe, purulent-destructive variants of this kidney infection are associated with a range of bacteria such as E. coli, Klebsiella, Proteus, Serratia species, Pseudomonas, and enterococci. Consequently, the judicious choice of antibacterial and antimicrobial agents is paramount. Acute pyelonephritis represents a substantial portion, up to 14%, of all kidney ailments. Among these, a significant 30% of patients develop purulent complications, including apostematous pyelonephritis, renal abscesses, and carbuncles. These aggressive kidney infections frequently result in extensive purulent-destructive disease affecting the retroperitoneal area, presenting considerable challenges for surgeons. In recent clinical observations, surgical

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practitioners have noted the spread of purulent inflammation distally into the inguinal region and thigh. This phenomenon is particularly prevalent in individuals with diabetes mellitus and suggests a need for refined surgical management approaches for such patients. Purulent-destructive processes within the retroperitoneal space, whether involving the kidneys or other organs, are life-threatening and require careful consideration when planning surgical treatment. The most perilous sequela of purulent-destructive pyelonephritis is the onset of urosepsis, which can necessitate nephrectomy in as many as 35% of cases. For patients with complicated urosepsis, mortality rates are alarmingly high, ranging from 28.4% to 80%, emphasizing the vital role of timely and skilled medical intervention. The objective of this research is to examine the clinical and laboratory indicators observed in patients afflicted with purulent-inflammatory conditions of the retroperitoneal space.

MATERIALS AND METHODS

Methodology: This study involved a retrospective review of medical charts for 439 individuals diagnosed with purulent-inflammatory conditions of the retroperitoneal space. These patients received inpatient care at the purulent surgery department of the multidisciplinary clinic at Tashkent Medical Academy between 2010 and 2022. This cohort was assembled to form the basis of our observational group. The female participants' ages spanned from 15 to 74 years, with a mean age of 39.7 years. For male patients, the age range was 28 to 74 years, with an average age of 42.5 years. A detailed breakdown of patient demographics by sex and age is presented in Figure 1. Prior to initiating treatment, all patients underwent comprehensive clinical laboratory assessments, alongside multi-slice computed tomography (MSCT) and ultrasound examinations of the retroperitoneal region. These imaging modalities were crucial in guiding surgical decision-making. Our findings revealed that a localized purulent collection (abscess) was identified in 28.7% of cases, phlegmonous inflammation was present in 51.4%, and a combination of these or the presence of postoperative fistulas was noted in 19.9% of patients. Upon admission, all patients commenced empirical antibiotic treatment. Following the results of bacteriological investigations, antibiotic therapy was then tailored to be specific and effective.

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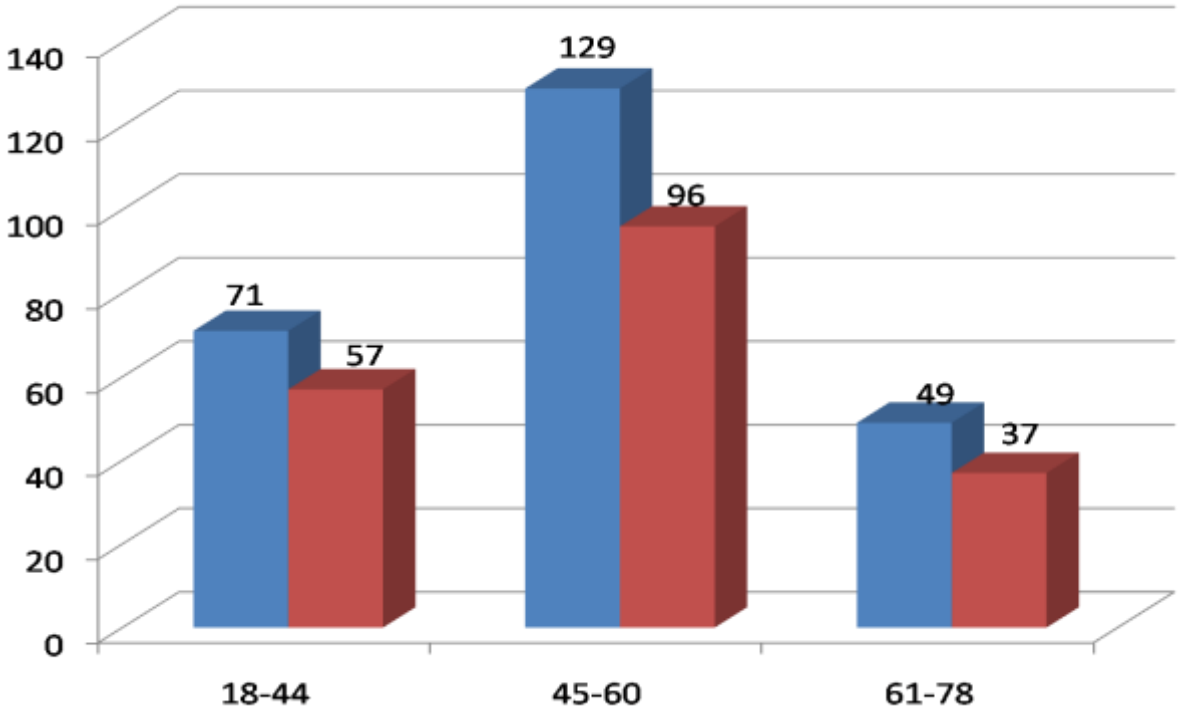

Fig.1. Distribution of patients by sex and age.

The patient cohort included 351 individuals (79.9%) diagnosed with diabetes mellitus. All participants were assessed by an endocrinologist, who recommended suitable interventions for glycemic control. After detailed examinations, all patients were admitted for elective surgery on days 2-4 of their hospitalization.

Statistical analysis of the collected data employed parametric methods, specifically for comparing two independent, related populations assuming a normal distribution. The Excel-2010 software was utilized to compute the Student's distribution, enabling the construction of confidence intervals. To ascertain differences, the Student's t-test was applied, calculating the arithmetic mean, standard deviation of the difference, standard error of the mean difference, t-statistic, and p-value (probability of error). The criteria for statistical significance were established as follows: $t<2$ ($p>0.05$) indicated no statistically significant differences, while $t>2$ ($p<0.05$) denoted statistically significant differences, with stricter significance observed at $t>2.6$ ($p<0.01$) and $t>3.3$ ($p<0.001$). The Excel-2010 program served as the tool for this statistical processing.

RESULT AND DISCUSSION

In the analysis of purulent conditions within the retroperitoneal space, abscesses of diverse origins were the most prevalent clinical presentation, accounting for 54.1% of the study group. Secondary purulent infections, arising after initial surgical procedures, represented 26.7% of patients. Suppurating

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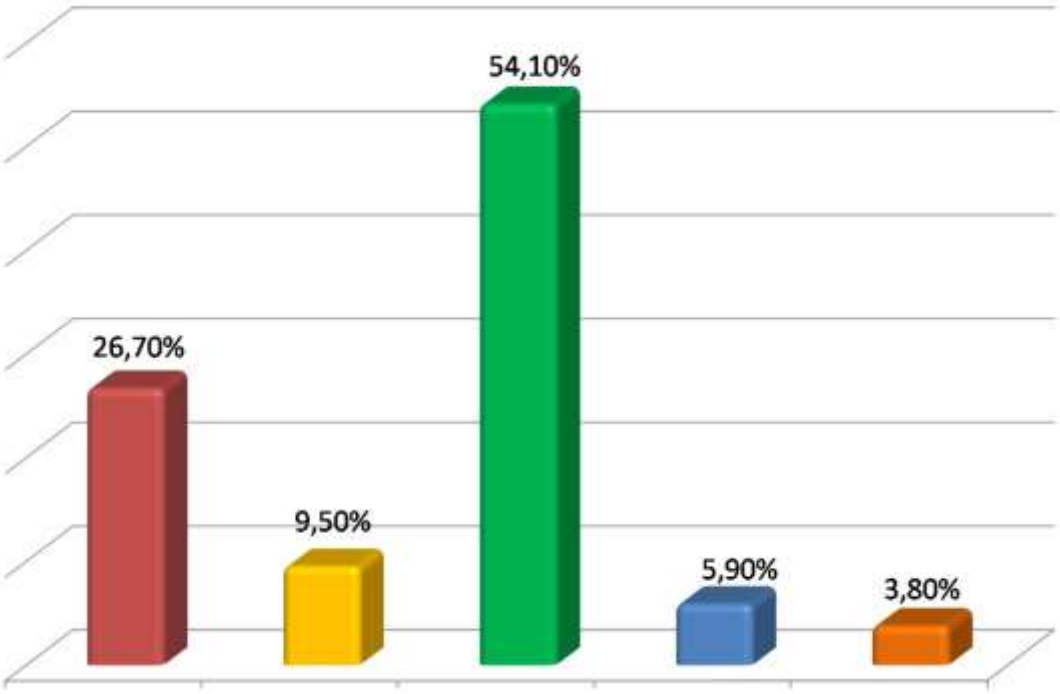
hematomas were observed in 9.5% of instances, while specific infections like spinal tuberculosis occurred in 5.9%, and the breakdown of retroperitoneal tumors was noted in 3.8% of cases (as depicted in Figure 2).

Regarding co-existing health issues, diabetes mellitus (Type I) was present in 16.9% of patients, and Type II in 63.0%. Urolithiasis affected 16.9%, arterial hypertension 13.2%, coronary heart disease 3.8%, hepatitis B 1.9%, and hemophilia A 1.9%. Purulent paranephritis was a less frequent complication, seen in 3.8% of patients experiencing issues related to their primary condition. Postoperative wound infections occurred in 9.4%, and sepsis in 1.9%. Notably, a significant majority, 85%, of patients experienced no complications following surgery.

Prior to surgery, cardiac and renal functions were managed. All patients underwent elective surgical intervention.



1.secondary purulent disease. **2.hematoma suppuration.**
3. abscesses of various etiologies. **4.specific infection.**
5. collapse of the tumor.

Fig. 2. Clinical forms of purulent diseases of the retroperitoneal space.

Here's the text rewritten with different wording, while retaining the original meaning and not translating to Russian:

During the assessment of complete blood counts, it was observed that 41 patients (77.4%) exhibited an elevated leukocyte count, averaging 6.6±0.4x10^9/L.

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Furthermore, 96.2% of individuals presented with an increased erythrocyte sedimentation rate (ESR), averaging 47.7±7.2 mm/h.

Utilizing the leukocyte differential count, the leukocyte intoxication index (LII) was computed as a measure of tissue breakdown and the degree of endogenous intoxication. In our cohort, the mean LII was 3.4±1.06, with a range from -0.38 to 11.4.

The ratio of leukocytes to ESR was calculated at 8.03±2.0, ranging from 0.38 to 19.3. This index showed a significant upward trend compared to the average, suggesting systemic intoxication linked to inflammation. The lymphocyte-granulocyte index (LGI), averaging 1.96±0.42 (range: -0.53 to 4.49), was found to be decreased, indicative of infectious intoxication.

Urinalysis revealed leukocyturia in 56.6% of patients, further supporting the presence of an inflammatory process within the body. Notably, despite the presence of diabetes mellitus in many patients, severe leukocytosis was not consistently observed. Instead, a reduced immune status often resulted in normal laboratory parameters.

The majority of patients underwent procedures such as revision of the retroperitoneal space, debridement, and sanitation of infected areas. Minimally invasive interventions, including abscess drainage and kidney decapsulation, were performed in 56.5% of cases. Nephrectomy, aimed at controlling the purulent focus and preserving life, was necessary for 12 patients (21.7%).

Immunomodulatory agents from various classes were administered for immune system support. Antibacterial therapy involved meropenem plus sulbactam (38.6%), polymyxin (13.7%), piperacillin plus tazobactam (9.1%), and fluoroquinolones (38.6%), with selections guided by antibiotic resistance testing. Clindamycin (1200 mg/day) was universally employed as an anaerobic agent. Initial treatment commenced with empirical antibiotic therapy, transitioning to targeted therapy once culture and sensitivity results were available.

DISCUSSION

Key Findings from Urine Culture and Antibiotic Resistance:

The most prevalent microorganism identified in urine cultures was *E. coli*. Antibiotic susceptibility testing revealed that *E. coli* strains in this study were most responsive to polymyxin, meropenem + sulbactam, clindamycin, piperacillin + tazobactam, and amikacin.

Demographics and Disease Characteristics:

The study observed that purulent-inflammatory conditions affecting the kidneys and retroperitoneal space were most common among young individuals,

with a higher incidence in women. Retroperitoneal abscesses represented the most frequent clinical presentation, accounting for 54.1% of all cases.

Comorbidities and Disease Severity:

A significant majority of patients (79.9%) had a history of type I or type II diabetes mellitus. Purulent-inflammatory diseases proved particularly challenging in patients with type II diabetes, as the rapid advancement of infection severely complicated both medical management and surgical interventions.

Laboratory Indicators of Inflammation:

Laboratory analyses indicated systemic inflammation, evidenced by elevated levels of the leukocytic intoxication index, the leukocyte-erythrocyte sedimentation rate (ESR) ratio, and the lymphocytic-granulocytic index. These markers collectively pointed to body-wide intoxication stemming from the inflammatory process. Specific average values observed were: Leukocytic Intoxication Index (LII) of 3.4±1.06 (range: 0.38–11.4), ESR of 8.03±2.0 (range: 0.38–19.3), and Lymphocytic-Granulocytic Index (LHI) of 1.96±0.42 (range: 0.53–4.49).

Surgical Interventions:

The primary surgical approach involved opening and debriding the infected area, followed by drainage of the retroperitoneal region. A novel drainage technique for the retroperitoneal space was employed during open procedures to mitigate the spread of infection along fascial planes in diabetic patients. Minimally invasive procedures were also performed, including abscess drainage and kidney decapsulation in 56.5% of cases. A history of nephrectomy was noted in 12 patients (21.7%).

Conclusion and Future Directions:

Achieving favorable postoperative outcomes in patients with retroperitoneal purulent-inflammatory diseases, especially those with diabetes, necessitates a comprehensive consideration of numerous factors and the specific nature of the infection. This is crucial due to the heightened risk of fasciitis in this patient population. Consequently, the development of an effective diagnostic and treatment algorithm for retroperitoneal purulent diseases in diabetic patients is a paramount focus in contemporary surgical practice.

CONCLUSION:

Purulent-inflammatory diseases of the retroperitoneal region in most cases are preceded by abscesses (54.1%) and primary surgical operations on the organs of the retroperitoneal space (26.7%).Against the background of diabetes mellitus, purulent-inflammatory diseases generally proceed latently and laboratory parameters in these patients are not clear criteria for determining the surgical tactics of treatment.In connection with the peculiarity of the clinical course of the

purulent process in patients with diabetes mellitus, all factors that affect the final result in the postoperative period should be studied, and these data indicate the need for research in this direction.

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