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Urological complications in the context of endometriosis: A review

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ABSTRACT

Introduction: Endometriosis is a chronic inflammatory disease that occurs mainly in women of reproductive age. It can cause severe pelvic pain and make it difficult to get pregnant. The severity of symptoms and possible complications depend on the size and location of the lesions. Women with deep endometriosis are at risk for serious urological complications arising from surgical interventions. **The Aim:** This work shows how serious complications can occur in people with endometriosis. **Case Report:** This work presents a 31-year-old female patient with endometriosis of the deep pelvic organs. Due to endometriosis-related infertility, the patient opted for radical resection of the endometriosis lesions. The patient developed urosepsis after surgery. **Results:** In the case of resection of endometriosis lesions in the pelvis, the possibility of urinary tract infections must be taken into account. The patient's condition should be monitored, appropriate care should be prescribed, the infection should be controlled, and appropriate antimicrobial therapy should be administered. **Conclusions:** When complications such as urosepsis occur after surgery, effective and immediate treatment including antimicrobial therapy is most important. It is necessary to prevent recurrent infections.

Keywords: Endometriosis, urosepsis, urostomies

1. INTRODUCTION

Endometriosis is a chronic inflammatory illness that causes discomfort and infertility. It is linked to a significant daily life handicap and a severe socioeconomic burden (Wang et al., 2022). This ectopic endometrial tissue affects a large number of women who are of reproductive age, making it a crucial worldwide health concern. Furthermore, endometriosis is one of the paintings of

a woman's ability to reproduce and her quality of life at this time factors influence (Coccia et al., 2022). The most typical symptoms in women include infertility, dysmenorrhea, dyspareunia, and persistent pelvic discomfort, while some may not show any symptoms at all. The degree of the symptoms is connected with the location, kind, size, and quantity of endometriotic lesions (Karaman and Uslu, 2015).

While surgery is still the best option for a conclusive diagnosis and treatment, its dangers, particularly in the case of endometriomas, must be considered with the possibility of decreased ovarian reserve and postoperative morbidity (Falcone and Flyckt, 2018; Bonavina and Taylor, 2022). The surgical approaches for the condition are determined by the location, size, quantity, and depth of the lesions. The objectives of endometriosis surgery include removing all visible implants, adhesiolysis to restore pelvic architecture, ovarian cystectomy if required, excision of deep implants, prevention of recurrences, increased chances of conception, and, in the end, improved quality of life (Giudice and Kao, 2004; Tanbo and Fedorcsak, 2017). Adenomyosis externa, also known as deep endometriosis, typically manifests as a solitary nodule in the vesicouterine fold or proximity to the bottom 20 centimeters of the colon, with a diameter of more than 1 cm.

About 5% of instances with deep endometriosis result in hydronephrosis due to the involvement of the ureter (De-Cicco et al., 2009). Late complications after deep endometriosis surgery include recto-vaginal and uretero-vaginal fistulas, as well as late bowel and ureteral perforations. Though there isn't much experience, laparoscopy can be used to treat vesicovaginal and ureterovaginal fistulae right away to prevent the development of severe fibrosis. While it is still unclear how to treat rectovaginal fistulae, it is recommended to wait a minimum of six weeks because some of the smaller fistulae heal on their own. Bowel resection or, less frequently, conservative vaginal closure is the usual next step (Koninckx et al., 2012).

2. METHODOLOGY

The search terms (endometriosis) AND (complications) OR (surgery) OR (urology) were used on PubMed and Google Scholar to find current publications for this review. We used the titles and abstracts to evaluate every article after removing duplicates and 18 papers met our inclusion criteria. The study was conducted in June of 2024.

3. RESULTS

We would like to present the case of a 31-year-old patient admitted to the ER with nonspecific symptoms of urinary tract inflammation, suffering from deep pelvic endometriosis. Due to endometriosis-dependent infertility, the patient decided on laparoscopic surgical intervention- radical endometriosis lesions resection. As a consequence of intra-surgical complications, it was required to emerge urostomy and ileostomy along with anterior rectal resection. On the day of admission, the patient presented a decreased amount of urine in stoma pouch, weakness as well as mildly increased body temperature. The following laboratory tests have been ordered: complete blood count, CRP, 24-hour urine volume test, glomerular filtration rate/creatinine, electrolytes, and procalcitonin. Imaging diagnosis included an X-ray of the chest cavity, ultrasonography of the abdominal cavity, and CT of the abdominal cavity, and pelvis with no contrast.

Considering the complicated medical history of the patient a few consultations have been performed. Gynecological examination including transvaginal USG haven't shown any abnormalities that could be connected with the presented symptoms. As urological and surgical consultations followed it was still unclarified which procedure should be performed to limit symptoms progression. There was no evident indication of inflammation, possible surgical complications, or newly discovered lesions. There was no empirical antibiotic therapy implied in the emergency room. Considering no indications for hospitalization, the patient has been discharged with a diagnosis of urinary tract infection as laboratory results along with relatively low CRP suggested such.

She was ordered with Cefuroxime. The patient was admitted to Nephrology Clinic four days later with developing urosepsis. General condition was severe, blood pressure about 80/50mmHg, urine retention developed. Body temperature reached 39,5 degrees Celsius. Laboratory results while admission are presented in (Table 1). CT scan - chest cavity, abdominal cavity and pelvis (presented in Figure 1 and Figure 2) free fluid in the pleural cavities - in the visible range up to 3 cm on both sides, atelectasis in the adjacent parenchyma. Central venous catheter within the reach of SCV opening. Generalized oedema of the subcutaneous area - free liquid described around the left lobe of the liver (up to 13 mm), free liquid appears in the iliac fossa, proper density of the parenchyma

(approx. 52jH) - in the native image hypodense lesions up to 10 mm diameter - to control in MR. Thin-walled gallbladder, without visible deposits.

Pancreas of proper size, without identified focal lesions. Wirsung duct of proper diameter. Standard-sized kidneys with a length of 115 mm right, 125 mm left - both without urinary stasis, without deposits, secreting contrasted urine. Left kidney parenchyma heterogeneous with the occurrence of diffuse, wedge-shaped areas of weaker contrasting, diffuse inflammatory, pyelonephritis lesions. Occasional subcapsular interstitial abscesses are suspected. Ending of the Nelaton catheter in the renal pelvis. No urine leakage outside the urinary tract confirmed. Final diagnosis: pyelonephritis of the left kidney with suspected microabscesses forming. Single hypodense lesions of the liver combined with symptoms suggests liver abscesses. Recommended MRI checked after anti-inflammatory treatment.

Blood smear, urine and vaginal smear have been analyzed. Urine smear revealed growth of *Enterococcus faecium* resistant to Clindamycin and Cephalosporins whereas vaginal smear was found positive for *Candida Glabrata* and *Candida Krusei*. Considering the patient's severe general condition and blood pressure drops, pressor amines were used: Levonor in the infusion pump and empirical antibiotic therapy containing Meropenem and Vancomycin as well as albumin transfusion and steroids. Urine culture tests confirmed presence of pathogens sensitive for implemented antibiotic therapy replenished with intravenous treatment with Fluconazole.

During hospitalization, after the patient's state stabilized gynecological consultation was requested, and showed no abnormalities or necessity of any gynecological treatment. During urological consultation with the assistance of ultrasound, the Nelaton catheter was implied to obtain urine outflow. Urine samples were taken. Due to possible kidney and liver abscesses surgical consultation was requested yet has not shown the necessity of surgical intervention, instead continuation of antibiotic therapy was recommended. In follow-up ultrasound abscesses were not present. The patient was discharged from the hospital in good general condition without any ailments. Hospitalization took 13 days.

Table 1 Laboratory results

| Laboratory results | Admission to Nephrology Clinic | After implicated hospital treatment |
|-------------------------|-------------------------------------|-------------------------------------|
| WBC | 36.97x 10 ³ | 6.10x10 ³ |
| CRP | 39.2 mg/dl <1.0 H | 0.7 mg/dl <1.0 H |
| PCT | 12.83 ng/ml <0.5 H | 0.03 mg/dl <0.5 H |
| GFR | >90ml/min/1.73 m ² >60 N | >90ml/min/1.73 m ² >60 N |
| Creatinine | 0.55 mg/dl 0.52- 1.04 | 0.58 mg/dl 0.52-1.04 |
| Albumin | 2.7 g/dl 3.5-5.5 L | 3.3 g/dl 3.5-5.5 L |
| Protein amount in urine | 302 mg/dl | absent |

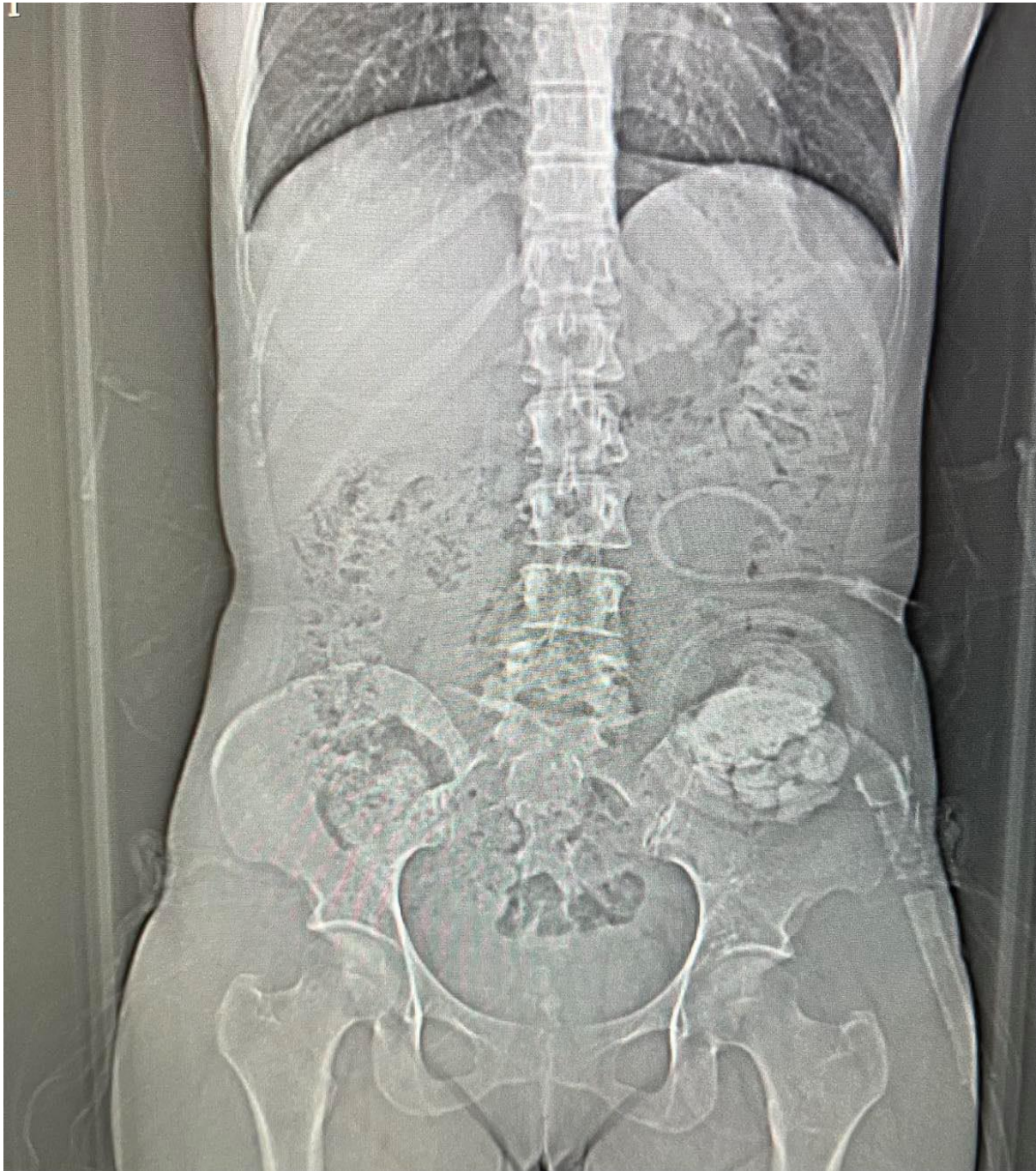


Figure 1 CT scan with visible Nelaton catheter within the left kidney.

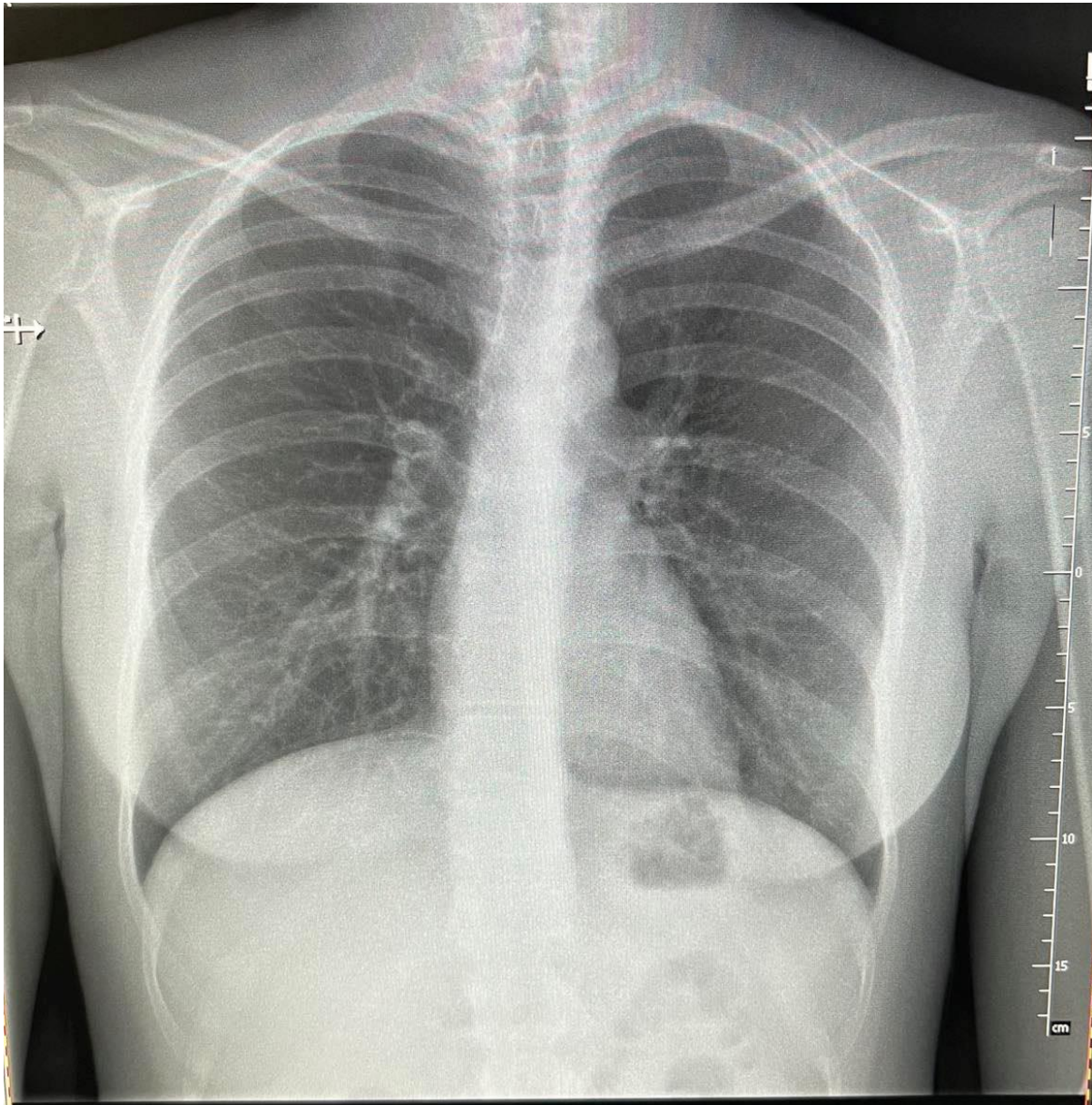


Figure 2 Pleural effusion.

4. DISCUSSION

The patient presented in the clinical description suffered from urosepsis - the most severe possible type of urinary tract infection. Patients hospitalized due to urosepsis usually have complicated urinary tract infections (Nicolle, 2013). Improperly treated urosepsis can lead to serious complications and even death (Guliciuc et al., 2021; Wagenlehner et al., 2015). Surgical treatment of endometriosis also plays an important role in the patient's history. First of all, it increases the risk of complications, including infections. The patient has been hospitalized several times, which suggests the presence of a disease requiring regular medical care. The patient had an ileostomy and urostomy. Proper stoma care is crucial in preventing complications such as infection and dehydration.

If urosepsis occurs, first of all, the patient's condition should be monitored, the infection controlled and appropriate antimicrobial therapy administered. Prompt treatment is essential, including antimicrobial therapy and elimination of the source of infection, as well as measures to support circulatory and respiratory stabilization and supportive therapies such as hemodialysis and glucocorticoid therapy (Babakhanlou et al., 2022; Wu et al., 2023; Stangl et al., 2024). Coordinated care for patients with urosepsis is very important,

including ostomy care, patient education, close health monitoring and appropriate treatment to ensure the best possible prognosis (Dreger et al., 2015; Guliciuc et al., 2021; Bonkat et al., 2019).

5. CONCLUSIONS

Women with deep endometriosis who undergo surgical treatment are at risk of developing severe urological complications. Deep endometriosis in the context of infertility can be particularly challenging, as it requires balancing gynecological considerations and the desire for childbearing against the potentially life-threatening complications associated with such demanding surgical procedures. Moreover, the phenomenon of endometriosis is frequently marginalized as a diagnosis of exclusion, despite many women can suffer from this condition on a daily basis.

It often takes many years from the onset of initial symptoms to reach an accurate diagnosis, which increases the complexity of subsequent procedures such as surgical treatment and its potential severe postoperative complications. Urosepsis can be a life-threatening emergency that necessitates immediate treatment to prevent irreversible processes. Empirical intravenous antibiotic therapy, followed by targeted therapy, along with the timely administration of vasopressors, steroids, and albumin, can prevent organ failure and death.

Author's Contribution

Kinga Piela: Conceptualization, writing- rough preparation, methodology

Klaudia Włodarczyk: Resources, writing - rough preparation

Maria Myślicka: Methodology, visualization

Jolanta Mazurek: Resources, writing- rough preparation

Gabriela Mazurek: Conceptualization, writing- rough preparation

Patryk Góralski: Resources, investigation

Cezary Bochyński: Resources, data curation

Anna Józefiak: Review and editing, supervision

Magdalena Szczepanik: Formal analysis, supervision

Maciej Horbaczewski: Resources, writing-rough preparation

Dominika Kropidłowska: Formal analysis, supervision

Przemysław Hałasiński: Visualization, data curation

Project administration: Kinga Piela

Informed consent

Not applicable.

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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