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Pain management in the right iliac fossa during the Covid-19 pandemic

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ABSTRACT

Abdominal pain in the right iliac fossa in women may be caused by a complicated ovarian cyst, adnexitis, and appendicitis. The paper analyses the characteristics of patients with right iliac fossa pain admitted during the Covid-19 pandemic. A retrospective analysis on 25 cases with abdominal pain in the right iliac fossa admitted to "St. Apostol Andrei" Emergency County Clinical Hospital Constanta, Romania between March 2020 and March 2021 was performed. In 52% of the cases, the symptomatology remitted with antispasmodics, 4 (16%) patients had cystic torsion and right adnexectomy (group A, without adnexa), 6 (24%) patients had ruptured cysts and right cystectomy, and 2 (8%) had immediate cystectomy together with appendectomy due to signs of peritoneal irritation (group B, adnexa retained). The age, the signs and the symptoms, as well as the inpatient diagnosis in group A were lower compared to patients in group B. The ovarian cyst can become a major surgical emergency if twisted or ruptured and it reaches an important vascular source, especially if it is associated with acute appendicitis, which often poses problems of differential diagnosis. The collaboration between gynecologists and surgeons is essential in the optimal therapeutic solution of these cases.

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Introduction

The ovarian cyst represents a common gynecological pathology, having more a benign state in young women, and malignant in elderly women [1,2]. The signs and symptoms of ovarian cysts could be represented by nausea, vomiting, or difficulty in the abdomen, dysmenorrhea, dyspareunia and frequency and difficulty emptying the bladder [3].

Adnexal torsion, either partial, or complete may result in the obstruction of venous and lymphatic reflux. In this context, the ovary together with the fallopian tube is rarely involved [4]. Moreover, the ovarian vessels become compressed because of the torsion of the pedicle. Therefore, the obstruction of the venous reflux could result in edema, observed as a dark-purple appearance on the ovary [5]. In the same context, calcifications and auto amputation of the ovary could occur [6,7].

In the case of a ruptured ovarian cyst, most patients may be managed under observation, analgesics, and rest, but some may require surgery.

In women, the clinical spectrum which may lead to acute abdominal pain is more frequent than in male patients. Therefore, it is important to make a differential diagnosis between digestive and gynecological causes. Signs like acute abdominal pain, along with appendicitis associated with hemorrhagic torsion cysts represent rare conditions [8-10]. Testing for inflammation biomarkers, such as liposaccharide binding protein (LBP), interleukin-6 (Il-6) or protein C reactive (PCR) may be useful in

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evaluating the degree of peritoneal inflammation [11]. An exceptional cause of pain that may be taken into account is Amyand's hernia, a rare entity in the surgical pathology, characterized by the presence of the vermiform appendix inside an inguinal hernia sac [12].

Although the majority of ovarian cysts solve without any treatment [13,14], the surgical intervention is related to acute symptoms, complex and/ or large masses (≥5 cm) [15].

Bearing this in mind, the purpose of our study was to analyze the clinical characteristics of patients with torsion or ruptured ovarian cyst, and the different surgical interventions which may also include appendectomy.

Materials and Methods

In this study, we retrospectively review 25 patients with right ovarian cyst symptomatology from "St. Apostol Andrei" Emergency County Clinical Hospital Constanta, Romania between January 2019 to October 2020. The Agreement of the Ethic Committee of `St. Apostol Andrei` Emergency County Clinical Hospital and the informed consent of the patients were obtained.

The study population consisted of all the women who came to the Obstetrics and Gynecology Department with a history of abdominal lump who were ruled out either with right ovarian tumor (15 patients, 60%), or suspected twisted ovarian cyst (6 patients, 25%) or right macrolesional adnexitis (4 patients, 16%) on the clinical examination, as well as on the transvaginal ultrasonography (TVUS) examination. The patients were divided into 2 groups taking into account the type of surgical procedures: adnexa preservation or adnexa removal. The cysts ranged between 3.5 and 8 cm in dimension.

The medical files of all the cases were retrospectively reviewed and further analyzed: the patients' clinical characteristics, the ultrasound imaging findings, the age, the inpatient diagnosis, the surgical procedures, and the postoperative recovery.

All the patients were young, cyclic patients with no comorbidities.

Statistical analysis

The patients' general clinical characteristics were analyzed using descriptive statistics.

Results

In this retrospective study, we included 25 patients with different inpatient diagnoses. Regarding the inpatient diagnoses, the patients were hospitalized with either right ovarian tumor (15 patients, 60%), or suspected twisted ovarian cyst (6 patients, 25%) or right microlesional adnexitis (4 patients, 16%).

Although all the patients presented pain in the right iliac fossa upon admission in this study, 4 (16%) patients with adnexal torsion did not have any emergent symptoms, only signs of peritoneal defense (positive Blomberg sign), similarly with patients with ruptured cysts (6 patients, 24%). Regarding those whose symptomatology was remitted with antispasmodics, 10 presented nausea and vomiting and 3 presented diarrhea. The other 2 patients with immediate cystectomy also had diarrhea upon admission.

The age distribution is as follows: out of the 13 patients whose symptomatology remitted, 5 patients were aged between 18-20 years and 8 patients were aged between 20-25 years. The age of the 4 patients who had cystic torsion and right adnexectomy ranged from 30 to 35 years. The age of about 6 patients with ruptured cysts was between 25-30 years and the age of the 2 patients with immediate cystectomy ranged between 25-30 years and 35-40 years, respectively.

Out of the 25 cases, 13 (52%) patients had a symptomatology remitted with antispasmodics and a mean cyst size between 2-4 cm, 4 (16%) patients had cystic torsion and right adnexectomy (group A, without adnexa, mean cyst size between 6-8 cm), 6 (24%) had ruptured cysts and right cystectomy and 2 (8%) had immediate cystectomy together with appendicectomy due to signs of peritoneal irritation (group B had their adnexa retained, mean cyst size between 3-6 cm).

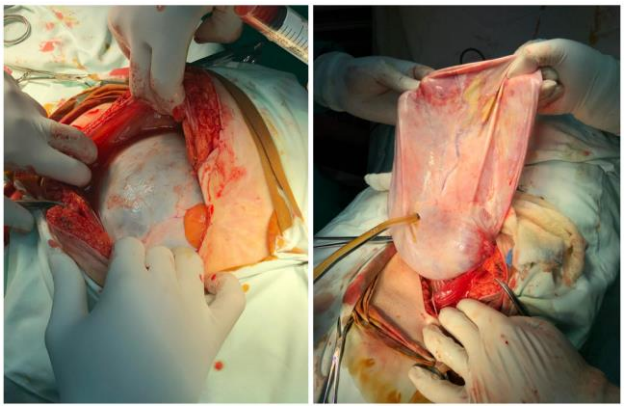

Figure 1. Large ovarian cyst with serous content

Out of the patients with ovarian cysts, 21 patients (84%) were included in group A (adnexa preservation) and 4 (16%) were included in group B (adnexectomy). All the surgeries were performed classically. For 4 (16%) patients with cystic torsion, the incision was median and for the 6 patients with ruptured cysts and 2 with immediate cystectomy, a Pfannenstiel incision was made.

In all 4 cases, the torsion of the ovary was confirmed intraoperatively. Due to the fact that in all 4 cases, the right appendix showed important signs of compromise (important purplish aspect), we considered that it was optimal to perform right adnexectomy.

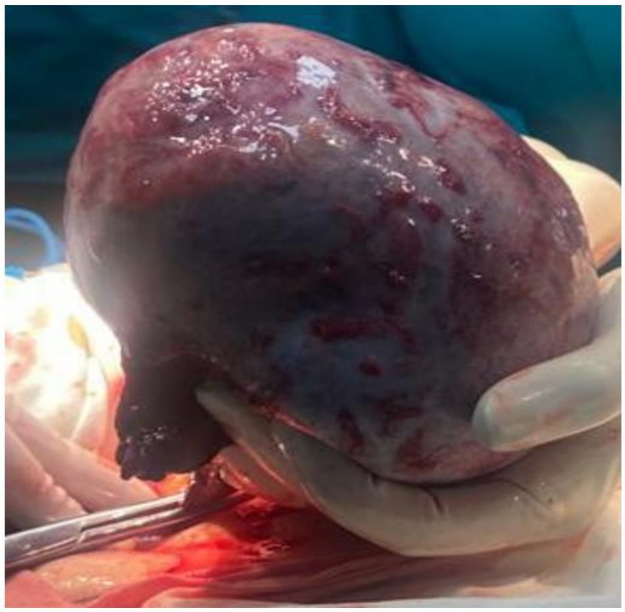

Figure 2. Large torsional ovarian cyst.

In the case of the 2 patients with immediate surgery and signs of peritoneal defense, intraoperatively, there were numerous adhesions between the right appendix, the appendix and the Cesarean section. Given the appearance of the appendix being of intense congestion, we considered it necessary to perform appendectomy with right cystectomy. In 6 cases of ovarian cysts ruptured a few hours after questioning, right cystectomy, lavage, and drainage were performed. Due to the fact that these cases were hospitalized in due time, the amount of blood in the peritoneal cavity was between 200-400 ml. In these cases, the operative indication was taken on the ultrasound evidence of the cyst rupture and the appearance of the fluid blade at the bottom of the Douglas sac.

Moreover, we were in favor of the classic interventions and not of the laparoscopic ones, due to the fact that the interventions were performed as utmost emergencies, when other surgeries were performed during the on-call period, the on-call doctors being busy with other interventions. One important aspect was that all the surgeries were performed during the COVID-19 pandemic and the specific strict regulation were obeyed. The patients were tested by RT-PCR from the nasopharyngeal exudate to investigate the presence of SARS-Cov-2 infection. Until the result turned negative, they were managed as possible suspects and all precautions were taken to mitigate the risk of infection transmission: wearing masks, specifically designed circuits and isolation areas [16]. When surgery was performed in the emergency room, before the result of the test was available, we followed the measures recommended to minimize the emission of aerosols during the intervention, consisting in reduced pressure of the pneumoperitoneum, tight incisions to prevent leakage at the trocar orifices, minimum use of energy devices and the use of cold hemostasis whenever possible [17].

The anatomopathological bulletins of the cysts and their shirts were benign, the macroscopic aspect of the ovary being often the only indicative landmark for the surgeon and the gynecologist, in establishing the therapeutic conduct, respectively cystectomy, adnexectomy or ovariectomy.

Discussion

Nowadays, ovarian cysts represent a usual condition considering the new valuable diagnostic resources. Being more asymptomatic, these tumors can be more extensive, manifesting like a palpable abdominal mass. If these conditions appear, they could be easily misdiagnosed even after clinical ultrasound examinations [18]. When the acute abdominal pain appears in the right lower quadrant, the main disorders can be either surgical, or gynecological.

Therefore, the gynecological pathology can be easily regarded as acute appendicitis. If adnexal pathology, which is a rare condition, is associated with appendicitis, it can be referred to surgery [19,20]. In our study, only 2 patients with acute adnexal pathology had immediate cystectomy along with appendectomy due to the signs of peritoneal irritation.

Interestingly, the TVUS used did not help predict the surgical over the non-surgical approach of the ovarian cysts because they represented only 48% (12 of 25) of the patients who underwent surgical intervention compared to 52% (13 of 25) of the patients whose cyst demonstrated resolution at TVUS. A potential explanation would be that hemorrhage is common in the cycle of follicular development and atresia [21].

Therefore, the main cause of abdominal pelvic pain should be excluded before an ovarian cyst is found. However, when female gynecologic or urologic symptoms appear, ectopic pregnancy, TOA, ovarian abscesses or appendicitis should be ruled out [22].

Immune responses and metabolic regulation are two essential mechanisms involved in cellular homeostasis, being responsible for human species survival and conservation [23]. The careful preoperative evaluation of the surgical and anesthetic risk factors is extremely important in minimizing the incidence of postoperative complications [24].

All the cases were treated during the Covid-19 pandemic, that imposed strict regulations to prevent the intra-hospital dissemination of the Sars-Cov-2 infection. Several clinical studies showed that male sex, hypertension, diabetes, obesity and chronic kidney disease were the most frequent among the COVID-19 fatalities [25-27]. On the other hand, surgical intervention on Covid-19 infected patients is associated with severe outcomes [28,29]. Whenever possible, the surgery was delayed until the Covid-19 test results were available. Ashcroft et al. raise awareness on the conditions associated with Sars-

Cov-2 infection that may mimic surgical presentations for pain in the right iliac fossa and emphasize upon the role of the preoperative CT exam in differential diagnosis [30]. Similar conclusions are found by Ball et al. [31]. The COVID-19 pandemic has increased the risks of surgery and the management of common surgical conditions has changed, with greater reliance on imaging and conservative management [31]. CT scanning is recommended in risk stratification for the patients presenting for acute pain in the right iliac fossa in order to reduce the rate of negative appendectomies.

A correct diagnosis made in due time could lead to a decreased mortality among the patients. When a higher ovarian cystic mass arises, it sometimes reveals specific characteristics of intestinal obstruction and digestive disorders. Only two mechanisms of the intestinal obstruction appear: first, the mass could lead to torsion due to different adhesions and second, because of the higher mass, it can cause compression [32]. Therefore, digestive disorders could frequently be seen in women as an emergency when the symptoms of acute abdomen appear.

Torsion is the twisting of the adjoining components. Most often, the ovary and the fallopian tube rotate around the broad ligament [33]. In 50-80% of the cases of ovarian torsion, a unilateral ovarian tumor has been identified [33].

Interestingly, the highest torsion rate occurs in ovarian masses between 6 and 10 cm [20]. In our study, patients with cystic torsion had a mean cyst size between 6-8 cm and those with immediate cystectomy along with appendectomy had a mean cyst size between 3-6 cm.

Most commonly, ovarian torsion occurs on the right side, due to the inability of the left appendix to mobilize, and due to the sigmoid colon [33,34]. The same study did not report any increase in morbidity in the women initially subjected of appendix distortion, compared to those in whom adnexectomy was performed. Moreover, a tumor rupture or the R1 resection of the primary tumor has a negative impact on disease-free survival [35]. Therefore, gynecological cancers pose an important public health issue, being some of the most frequent cancers among women of all ages [36-38]. Among the pathways involved in the immune response there are: disrupted autoimmune diseases, inflammatory processes, allergies, and endometriosis, the family of genes that regulate Toll-like receptors (TLRs), the types of molecules which regulate the activation of the immune response and the inflammation pathways could also be dysregulated [39].

In the past, adnexectomy was performed to rule out the risk of thrombosis. Current scientific evidence refutes this theory [33]. In the case of adnexal congestion without macroscopic signs of necrosis, we performed the right appendix distortion, followed by right cystectomy. In the 9 cases in which we performed surgery, we performed mini-laparotomies, always having the possibility of extending them. Mini-laparotomies significantly shortened the hospitalization periods.

In some patients, ovarian cysts can be resorbed without any surgical treatment. In our study, 13 patients showed a conservative management without surgery. In the case of blue or purple/black ovaries, it is recommended to remove the adnexa, although some studies indicated the fact that this appearance of the ovaries is not enough to indicate necrosis of the ovaries, thus further sustaining the preservation of the ovarian function [40].

Other studies show the fact that when the ovary is torsional, the time for the implementation of surgery should be less than 36 hours [41].

The results of the present study clearly demonstrated that the number of patients with retained adnexa was significantly higher than those with adnexa removal. This supposition is somehow controversial, considering the fact that ovarian cyst torsion could strangle the vein reflux, thus causing vein thrombosis. In the current study, none of the patients with retained adnexa had any postoperative complications, such as abdominal infection or embolic disease. In our case study, although only 2 patients underwent emergency surgery, being able to retain the patient's reproductive capacity, which was our goal from the very beginning.

The particularity of this study is that all cases were emergency cases, and thus they did not benefit from extemporaneous histopathological examination. We consider that the experience of the surgical team, often mixed, composed of a surgeon and a gynecologist, was the key to success in these cases.

Highlights

- ✓ Abdominal pain in the right iliac fossa in women may be caused by various gynecological or surgical pathologies.
- ✓ The collaboration between gynecologists and surgeons is essential in the optimal solution of these seemingly cases.
- ✓ The Covid-19 pandemic-imposed changes in the surgical protocol were effective in the prevention of the nosocomial transmission of Sars-Cov-2 infection.

Conclusions

In ovarian cysts, the patients associated with acute abdominal symptoms of appendicular origin, appendicitis should be ruled out during the stage of differential diagnosis. It is also important to conduct a good anamnesis and search for ovarian, tubal lesions or appendicular signs from the beginning, in order to solve both etiologies at the same time.

The ovarian cyst can become a remarkable surgical emergency if it is twisted or ruptured and it reaches an

important vascular source, especially if it is associated with acute appendicitis, with which it often poses problems during the differential diagnosis. Therefore, the collaboration between the gynecologist and the surgeon is essential for the optimal solution of these seemingly cases, the clinical examination and the ultrasonography representing the basis for the orientation of the therapeutic conduct.

Conflict of interest disclosure

There are no known conflicts of interest in the publication of this article. The manuscript was read and approved by all authors.

Compliance with ethical standards

Any aspect of the work covered in this manuscript has been conducted with the ethical approval of all relevant bodies and that such approvals are acknowledged within the manuscript.

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