

CASE REPORTS PRIKAZI SLUČAJEVA

OVARIAN TORSION – A LOW INCIDENCE DISEASE OFTEN LEADING TO AVOIDABLE OVARY LOSS

OVARIJALNA TORZIJA – RETKO OBOLJENJE KOJE ČESTO DOVODI DO NEPOTREBOG GUBITKA JAJNIKA

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Case report

Prikaz slučaja

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Abstract

Introduction. Ovarian torsion is an acute gynecological condition that can occur at any stage of a woman's life - from the fetal and neonatal period, through premenarche, reproductive age, and into postmenopause. The highest incidence of torsions is observed during the reproductive period. The most common risk factors include the presence of an adnexal mass (such as a functional ovarian cyst or a benign tumor), enlarged ovaries due to polycystic ovary syndrome or ovarian hyperstimulation, and a history of previous surgical interventions. Torsion results from partial or complete rotation of the adnexal structures, leading to partial or complete obstruction of blood flow and the onset of symptoms such as abdominal pain, nausea, and vomiting.

Case report. This paper presents four cases of ovarian torsion during the reproductive period, all caused by benign conditions. The first case involved strangulation of the ovarian pedicle around postoperative adhesions. The second case described adnexal torsion with tubal rupture, resulting in pelvic hemorrhage and localized peritonitis. The third case showed incomplete torsion of the ovary with a functional ovarian cyst and the development of adhesions. The final case involved a torsed benign ovarian tumor – fibrothecoma. **Conclusion.** Although ovarian torsion is occurrence relatively rare condition, it is typically associated with benign causes and can present as acute abdomen requiring emergency surgical intervention. Prompt diagnosis is crucial for preserving ovarian function, preventing complications, and safeguarding fertility.

Key words: Ovarian Torsion; Abdomen, Acute; Ovarian Cysts; Ovarian Neoplasms; Signs and Symptoms; Early Diagnosis; Treatment Outcome

Introduction

Ovarian torsion is an acute gynecological condition that can occur at any age, from neonates and premenarchal girls to women of reproductive age and

Sažetak

Uvod. Ovarijalna torzija predstavlja akutno stanje u ginekologiji i može se javiti, u svim periodima života žene od fetusa i neonatusa, devojčica u premenarhi, kod žena u reproduktivnom periodu i kod žena u postmenopauzi. Najveći broj torzija dešava se u reproduktivnom periodu, a najčešći faktori rizika su prisustvo adneksalne mase – funkcionalne ovarijalne ciste ili benignog tumora ili prisustvo uvećanih jajnika kod sindroma policističnih jajnika ili ovarijalne hiperstimulacije i kod žena sa anamnezom prethodnih hirurških intervencija. Torzija nastaje usled parcijalne ili kompletne rotacije adneksalnih potpornih struktura rezultirajući parcijalnom ili kompletnom opstrukcijom krvotoka i posledničnim simptomima – abdominalna bol, mučnina, povraćanje. **Prikaz slučaja.** U ovom radu prikazani su različiti uzroci benigne prirode koji mogu dovesti do torzije jajnika u reproduktivnom periodu života žene. U prvom slučaju prikazana je strangulacija ovarijalne peteljke oko priraslica nakon hirurške intervencije. U drugom slučaju radi se o torziji sa rupturom tube koja je prouzrokovala krvarenje u maloj karlici i razvoj lokalizovanog peritonitisa. U trećem slučaju prikazana je nepotpuna torkvacija jajnika sa funkcionalnom ovarijalnom cistom i stvaranjem priraslica. U poslednjem slučaju opisan je torkvirani benigni tumor – fibrotekom jajnika. **Zaključak.** Iako je ovarijalna torzija retko stanje i u najvećem broju slučajeva benigne patologije, može dovesti do razvoja akutnog abdomena koji zahteva urgentno hirurško lečenje. Pravovremeno postavljanje dijagnoze je važno kako za očuvanje funkcije jajnika tako i za prevenciju komplikacija i očuvanja fertiliteta.

Cljučne reči: torzija jajnika; akutni abdomen; ovarijalna cista; tumori jajnika; znaci i simptomi; rana dijagnoza; ishod lečenja

postmenopausal women [1]. The majority of cases occur during the reproductive period [2]. Although the true incidence remains unknown, ovarian torsion is estimated to account for 2.7-4% of all gynecological surgical emergencies, making it the fifth most com-

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Abbreviations

HCG – human chorionic gonadotropin
 CRP – C-reactive protein
 CA – cancer antigen

mon indication for urgent gynecologic surgery [3]. Torsion results from the partial or complete rotation of the adnexal structures, typically the ovary and fallopian tube, around the infundibulopelvic and utero-ovarian ligaments. The rotation leads to a reduction or complete cessation of blood flow to the ovary, causing ovarian enlargement due to edema, ischemia, necrosis, or local hemorrhage, and may ultimately result in loss of ovarian function [1,4,5]. The severity of clinical symptoms and morphological changes depends on the degree and duration of vascular compromise. In most cases, both the ovary and fallopian tube are involved in the torsion. Isolated torsion of either the ovary or the tube is rare and typically referred to as partial torsion. Uncommon presentations include bilateral and asynchronous ovarian torsion, which have also been reported in the literature [6]. The most significant risk factors for ovarian torsion in reproductive-age women include the presence of adnexal masses (functional cysts or benign tumors), enlarged ovaries in polycystic ovary syndrome (as defined by the Rotterdam criteria) [7], ovarian hyperstimulation syndrome, previous ovarian torsion [8], and prior pelvic surgery resulting in adhesions. Prompt diagnosis is essential to preserve ovarian function and prevent complications [9].

Aim of this paper is to present a series of ovarian torsion cases caused by benign etiologies reproductive-aged women, diagnosed and treated at a secondary-level hospital. All procedures involving human participants were conducted in accordance with the ethical standards of 1964 Helsinki Declaration and its subsequent amendments, and were approved by the Ethics Committee of the General Hospital Pirot. Written informed consent was obtained from all patients for publication of the presented material.

Case Reports

Case 1

A 46-year-old woman was referred to the General Hospital Pirot with complaints of intermittent abdominal pain that had begun earlier the same day, accompanied by vomiting and diaphoresis. Her medical history included an appendectomy 25 years prior and a videolaparoscopy for a right-sided ectopic pregnancy 18 earlier. She had previously been diagnosed with a myoma and reported two vaginal deliveries. Her last menstrual period had begun three days prior to presentation. On admission, the patient was

afebrile with a body temperature of 36.4 °C, normotensive (BP 120/65 mmHg), with a heart rate of 60 bpm and arterial oxygen saturation of 95%. Laboratory workup, including serum human chorionic gonadotropin (hCG) and C-reactive protein (CRP), was initiated. Abdominal plain radiography and ultrasound were also performed. Physical examination revealed a rigid and tender abdomen with diffuse guarding. Speculum examination showed minor bleeding from the cervix os. Bimanual examination revealed a positive Proust sign, a tender and immobile uterus, and bilateral adnexal tenderness, more pronounced on the right. The Douglas pouch was tender and filled. Transvaginal ultrasound demonstrated a retroverted, retroflexed uterus measuring 70.6 x 69.6 mm, with a posterior wall myoma measuring 4 cm in diameter. The left ovary appeared normal, containing small follicles, and measured 30.9 x 25 x 2 mm. The right ovary was located posterior to the uterus and was enlarged, measuring 80.3 x 37.8 mm. It contained a 40 mm cyst with mixed echogenicity, as well as two smaller cysts. Color Doppler showed no detectable blood flow in the right ovary, and a small amount of fluid around it. The patient was taken to urgent surgery, where intraoperative findings revealed a torsed, cystic, and enlarged right ovary located in the Douglas pouch, surrounded by adhesions and displaying dark discoloration. Following adhesiolysis, a right oophorectomy was performed. Histopathological analysis confirmed hemorrhagic infarction of the right ovary. The patient recovered with no complications, and was discharged on postoperative day five.

Case 2

A 40-year-old woman presented to the Gynecology Department with severe pelvic pain that had begun five days earlier. Although her menstrual cycles were regular, she experienced an episode of intermenstrual bleeding on the day of admission, accompanied by an intensification of pain. Upon presentation, the patient was conscious, orientated, afebrile and normotensive. Speculum examination revealed minor ex utero bleeding. Bimanual examination demonstrated a tender and filled tender Douglas pouch, with mild tenderness in the left adnexal region and pronounced tenderness on the right. Transvaginal ultrasound showed a retroverted uterus of normal size and appearance, with an endometrial thickness of 5 mm. The uterine cavum was empty. The left ovary appeared normal in size and echotexture. On the right side, a sausage-shaped adnexal mass measuring 87 x 58 mm was identified. The mass contained a cystic component measuring 58 x 36 mm and a solid component that likely represented a hematoma extending

into the Douglas pouch. Laboratory findings revealed elevated inflammatory markers (leucocytes 18×10^9 , CRP 198.8 mg/l), and the patient was anemic. Serum human chorionic gonadotropin (hCG) was within normal limits. She was admitted for further evaluation and preoperative preparation. During surgery, extensive adhesions were found between the ascending colon and terminal parts of sigmoid colon and the adnexa bilaterally, as well as with the posterior aspects of the uterus. Following massive adhesiolysis, the mass within the Douglas pouch was accessed and gradually separated from the peritoneum. It resembled a hematoma. The left ovary and fallopian tube were found to be normal in both size and structure. On the right side, the ovary and fallopian tube were found in torsion – three full rotations around the ovarian tube and the utero-ovarian ligament. The fallopian tube was distended, filled with blood clots, and showed a visible rupture site. A right adnexectomy was performed. Hemostasis was secured, and peritoneal lavage was carried out. No intestinal injury was noted, aside from tissue induration. Other abdominal organs appear normal. A drain was placed in the Douglas pouch, and the resected tissue was sent for histopathological analysis. Postoperatively, the patient received analgesics, antibiotics, thromboprophylaxis, and gastroprotective agents. Inflammatory markers and hemoglobin levels were monitored. The patient was discharged after clinical stabilization and normalization of laboratory findings. Histopathological analysis revealed a blood clot with ovarian serosa and hilum tissue.

Case 3

The third patient was admitted to the Gynecology Department due to abdominal pain and dysuria persisting for seven days, accompanied by a fever of 38.5 °C. She was hemodynamically stable, without nausea or vomiting. Transvaginal ultrasound revealed a cystic lesion on the left ovary, measuring 66.2 x 41.8 mm, with opalescent contents, thin smooth walls, and peripheral (marginal) vascularity. Color Doppler imaging showed no blood flow within the cyst and slightly elevated resistance indices. The uterus and left ovary appeared normal. Laboratory investigations showed an elevated CRP level of 37.9 mg/l. Hematological and biochemical parameters were within normal limits. Tumor marker levels were also within the reference range: CA-125 at 17.8 U/ml and CA 19-9 at 4.2 U/ml. Initial conservative treatment yielded no clinical improvement, prompting the decision to proceed with surgical management. Laparotomy was performed via a Pfannenstiel incision. Intraoperative findings included a normal-sized, anteverted and an-

teflexed uterus with smooth, pink serosa. The right ovary appeared normal in size and structure. The left ovary was cystic and had undergone 180-degree torsion, with extensive adhesions to the small intestine and sigmoid colon. Following careful adhesiolysis, a left adnexectomy was performed. Staging procedure was completed, and the surgical specimen was sent for histopathological analysis. Histology confirmed the diagnosis of torsion of a follicular cyst and a serous paraovarian cyst.

Case 4

A 47-year-old woman was referred to the Gynecology Department for elective surgical treatment of a left ovarian tumefaction. She reported occasional dull pelvic pain. Preoperative investigations revealed normal levels of tumor markers, including cancer antigen (CA) 125, CA 19-9, human epididymis protein 4 and normal ROMA index. Her complete blood count and inflammatory markers were also within normal limits. We found a firm, smooth and immobile tumefaction on the right. Ultrasound examination revealed a heteroechogenic tumefaction measuring 10 cm in diameter, along with a small volume of fluid in the Douglas pouch. Intraoperatively, the left ovary was found to be enlarged – approximately the size of a clenched fist – partially firm and partially cystic, and twisted twice around the mesovarium. It was displaced anteriorly and to the right of the uterus. The surface of the tumefaction appeared necrotic, smooth, and shiny, with no surface excrescences. The left fallopian tube appeared normal. The right ovary and fallopian tube were also of normal appearance. The uterus behind the tumefaction appeared normal but contained several intramural myomas. The other abdominal organs appeared normal. No secondary deposits of the peritoneum were found. Lavage fluid was obtained for cytological examination. Following detorsion and tumefaction extraction, the ligaments were clamped, and a classic left adnexectomy and hysterectomy were performed. Biopsies of the omentum and peritoneum were taken, and the abdomen was closed. Histopathological analysis confirmed torsion of an ovarian fibrothecoma with cystic degeneration and hemorrhage. All other findings were normal. The patient had an uneventful postoperative recovery and was discharged five days after surgery.

Discussion

This case series highlights several distinct causes and clinical presentations of ovarian torsion, along with corresponding laboratory findings, diagnostic approaches and treatment modalities. Known risk

factors for ovarian torsion include adnexal masses, enlarged ovaries, elongated ovarian ligaments in premenarchal girls, and the presence of pelvic adhesions [10]. The diagnosis of ovarian torsion requires a combination of anamnestic data, objective examination, and imaging studies [1]. Patients may report a recent diagnosis of an adnexal mass, recurrent abdominal pain, vomiting, fever, or a history of abdominal surgery [11]. Most abdominal surgeries result in the formation of adhesions, which eventually cause organ fixation. The overall incidence of adhesions is 90% after laparotomy and 55-100% following common pelvic surgeries [12,13]. As a late complication, adhesions may lead to organ strangulation, chronic abdominal pain, female subfertility, or complications during reoperations [12]. In the first case, strangulation of the mesovarium was caused by adhesions following a previous appendectomy and salpingectomy, resulting in hemorrhagic infarction of the ovary. The most common symptom of ovarian torsion is sudden-onset, sharp lower abdominal or pelvic pain, often accompanied by nausea and vomiting in approximately 70% cases [1,14,15]. The pain is typically intermittent, poorly responsive to analgesics, and may radiate to the inguinal region or into the leg [1,8]. On physical examination, clinical suspicion should be raised in the presence of abdominal pain and tenderness and, occasionally, a pelvic mass [8,16]. Laboratory investigations should include at least hematocrit, leukocyte count, HCG, electrolyte levels, and inflammatory markers – CRP. While laboratory findings may be normal, they can also indicate anemia in cases of ovarian rupture or leukocytosis, or elevated CRP in the presence of necrosis and consequential inflammation [17]. The second case illustrates a scenario where ovarian and tube torsion led to pelvic hemorrhage, formation of an organized hematoma, intestinal adhesions, and localized peritonitis, which may progress to sepsis. The patient reported severe pain lasting several days, potentially explaining the complete necrosis of the ovary and the absence of ovary tissue on histopathological examination.

Imaging, particularly ultrasonography, plays a crucial role in the diagnosis. In adult women, transvaginal ultrasound is the first-line imaging modality, with high specificity but variable sensitivity (35-85%). Ultrasound allows assessment of ovarian volume, edema, adnexal masses, free abdominal fluid, and vascular flow using Doppler imaging [18,19]. A significant discrepancy in ovarian volume, coupled with ovarian displacement, is pathognomonic for torsion.

Other typical findings include peripheral ovarian follicles with hyperechogenic halos (“string of pearls” sign), and rounded, edematous ovaries. Doppler may show normal, reduced, or absent flow, and small amounts of free fluid may be observed in the pouch of Douglas [1,19].

Functional ovarian cysts are benign lesions that can be managed expectantly, treated medically with progestins, or surgically [20,21]. One of the risks of conservative management is torsion, especially when adnexal masses exceed 5 cm in diameter [22]. In the third case, a large follicular cyst in sub-torsion had formed adhesions to adjacent bowel loops, likely due to local exudation. The patient had prolonged pain and elevated inflammatory markers. Doppler ultrasound showed marginal blood flow with mildly elevated resistance indices.

The fourth case illustrates torsion of a benign ovarian tumor – a fibrothecoma – detected incidentally during elective surgery. Fibrothecomas are the most common ovarian stromal tumors and may occur at any age, though they are most frequently seen between the fourth and sixth decades of life. These tumors are usually asymptomatic but can become symptomatic when torsion occurs [23]. Surgery served both diagnostic and therapeutic purposes in ovarian torsion. A key component of surgical management is minimization of the duration of ischemia, although the precise threshold for irreversible ovarian damage remains unknown [1,22]. Intraoperative assessment of ovarian tissue viability is essential [8]. Complete necrosis may present as a gelatinous, disintegrating mass upon manipulation. The best-case surgical scenario includes detorsion alone or detorsion followed by ovariopexy. Ovarian cystectomy is preferred when benign pathology is confirmed [24], while salpingo-oophorectomy is indicated in cases of suspected malignancy, confirmed necrosis, or in postmenopausal women.

Conclusion

Ovarian torsion most commonly affects women of reproductive age and is frequently associated with adnexal masses. Although uncommon and usually of benign etiology, ovarian torsion can cause acute abdominal symptoms and may necessitate emergency surgical intervention. On the other hand, the diagnosis of ovarian torsion is often missed, and ovarian salvage is rare. Timely diagnosis is essential to preserve ovarian function, prevent complications, and optimize reproductive outcomes.

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