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CASE REPORTS

Uterovesical Abscess as Late Cesarean Complication - a Case Report and Review of the Literature

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Abstract

Pelvic abscesses located in the uterovesical space usually appear postpartum after cesarean delivery. Late presentation after months or years following surgery is rarely reported, especially in immunocompetent patients. We report the case of a young patient presenting an abscess of the uterovesical pouch, infiltrated in the myometrium, posterior wall of the bladder and parametrium. The case particularities include limited identifiable predisposing risk factors, acute onset of symptoms and belated diagnosis eight years after her second cesarean. The abscess removal by laparotomy required extensive debridement, total hysterectomy, bilateral salpingectomy and partial cystectomy, with good outcome after surgical treatment. We highlight the importance of a mixt urogynecology team for individualized case management and we discuss similitudes with other late cesarean complications.

Keywords: pelvic abscess, uterovesical space, cesarean complication, case report

INTRODUCTION

Uterovesical pouch abscess is a rare form of enclosed pelvic collection located between the anterior uterine wall and urinary bladder. It is usually associated with postoperative complications of pelvic surgery, including cesarean sections (CS).

As a short-term complication of CS, the uterovesical abscess usually forms in early puerperium due to bladder wall injury in low transverse uterine section called bladder-flap hematoma¹. On the other hand, late presentation months or even years after surgical interventions are rarely seen. Since cesarean section is the most

common surgical procedure in women worldwide, the rate of this potentially life-threatening complication is expected to rise.

Diagnosis relies mostly on modern imaging modalities since the symptoms, clinical and laboratory findings are nonspecific.

Therapeutic alternatives are those generally applied for pelvic abscess, including conservative medical management with broad-spectrum antibiotics or surgical interventions varying from minimally invasive drainage to laparoscopy or laparotomy. No standardized management protocols have emerged so far for this rare infectious entity.

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CASE REPORT

We present a case of a 35-year-old female patient who addressed the Department of Obstetrics and Gynecology of the Bucharest University Emergency Hospital for suspected urinary bladder endometriosis. The unique complaint of the patient was acute pelvic pain, which started during the last menstrual period and persisted postmenstrual, with a slight increase in intensity postmicturition. Previous cycles were regular with normal flow, no dysmenorrhea or abnormal vaginal discharge were reported.

Her medical history consisted of recurrent otitis and tympanoplasty a decade ago, no abortions, one premature vaginal delivery followed by two term cesarean deliveries by median laparotomy. The interval between the Cesarean Sections was seven years and the last cesarean was performed eight years ago and was declaratively uneventful. The previous gynecological evaluation two years before did not mention any abnormalities apart from a bacterial vaginosis for which she underwent local treatment.

Given the current acute pelvic pain, she initially addressed a local gynecology service, where clinical examination and pelvic ultrasound suggested the presence of a tumoral mass in the uterovesical pouch that was considered bladder endometriosis.

The patient underwent nonsteroidal anti-inflammatory drug therapy and addressed our department 3 weeks after symptomatology onset accusing no pain relief under treatment. At presentation, we found normal body temperature and vital signs. Speculum examination showed no lesions of the vulva, vagina, or cervix, normal vaginal discharge, and no urinary incontinence. The bimanual pelvic examination revealed marked tenderness in the vesicouterine septum, concomitant uterine tenderness, reduced mobility of normal-sized uterus, slight pain at cervix mobilization, and no adnexal tenderness. An ultrasound scan performed at this time showed a mixt multiloculated tumor occupying the vesicouterine pouch, in deep contact with the posterior bladder wall and with the anterior uterine wall (figure 1), an anteverted uterus with no structural anomalies – uterine corpus dimensions were 58/47/51 mm and cervical dimensions were 38/28 mm, 13 mm endometrial thickness, a hyperechoic cesarean scar with 15 mm thickness, both ovaries of normal dimensions and structure with no adnexal masses, no fluid in the rectouterine pouch.

At this point, for differential diagnosis we took into consideration a uterovesical or uteroperitoneal fistula, a pelvic abscess and endometriosis.

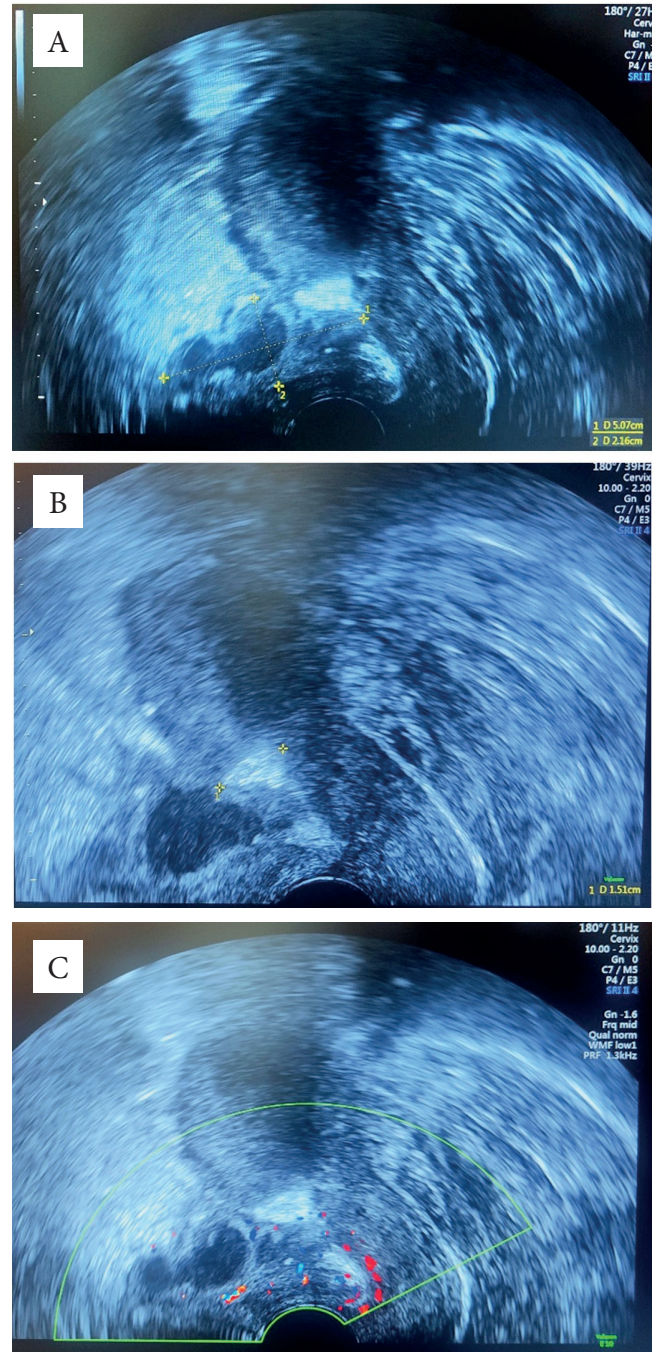




Figure 1. Transvaginal ultrasonographic images showing the multiloculated mass of 5 cm maximum dimension and heterogenous echogenicity- hypoechoic fluid containing hy-perechoic debris, located anterior to the uterus (A); low Doppler signal of the mass (B); thick and hyperechoic cesarean scar, but no clear disruption of the anterior uterine wall (C); the col-lection has poorly defined borders, presenting hyperechoic posterior acoustic enhancement and no clear separation from the posterior wall of the urinary bladder

Further pelvic magnetic resonance imaging was indicated and it described a pseudo-cystic mass measuring 4 cm, imprecisely demarcated from the uterine isthmus and the posterior wall of the urinary bladder, with edema of the bladder mucosa adjacent to it (figure 2).



Figure 2. Magnetic resonance imaging of pelvis, sagittal view, T2, depicting a space-replacing process at the level of the uterovesical recess, with no clear borders and pelvisubperitoneal infiltrative bands.

Laboratory results showed an elevated total count of leukocytes with 12960 cells/mm³ associating neutrophilia; platelet count - 444000 cells/mm³; elevated C-reactive protein (65.3 mg/l). The renal and liver function tests were normal, as well as the coagulation profile, ovarian and thyroid hormone levels. The urine culture test and genital swabs were negative for infection and the CA125 marker value was normal (18.6 U/ml). A negative urine test ruled out pregnancy.

A cystoscopy was further performed, showing bladder mucosal integrity without vesicouterine fistula (VUF), but localized bullous edema (figure 3).

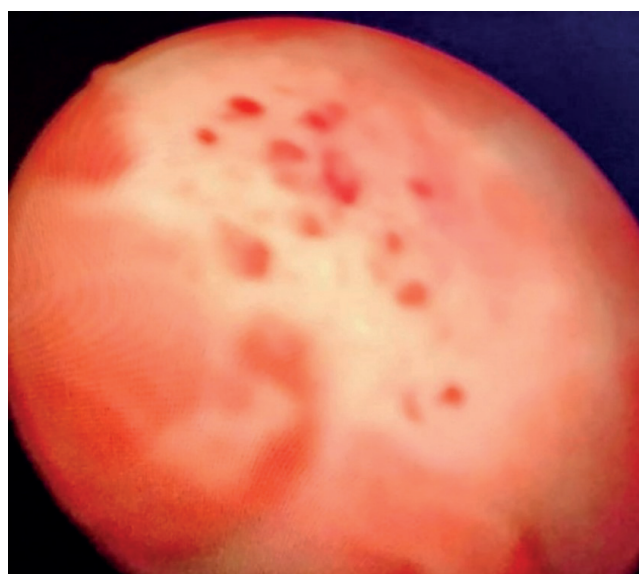


Figure 3. Cystoscopy image showing bladder inflammation with bullous edema on the posterior bladder wall mucosa, above the bladder trigone.

Medical management started with broad-spectrum intravenous antibiotics (Ciprofloxacin and Metronidazole) and analgesics. Clinical and ultrasound reevaluation showed no improvement after 3 days of medical treatment and surgery was planned with pre-operative counseling of the patient. She expressed no desire for fertility preservation.

Due to expected severe adhesions, a median iterative laparotomy was recommended, agreed, and carried out for examination and surgical treatment. Following omentum adhesiolysis, the pelvic examination found a firm mass between the anterior lower uterine body and the urinary bladder, with dense fibrotic adhesions between the parietal abdominal wall, bladder and

uterus; inflammatory changes of the left fallopian tube, a normal right fallopian tube, and normal ovaries.

A sample was taken from the uterovesical mass from an area of hard consistency and the frozen section showed conjunctive-fibrous tissue with inflammation and a central area of liponecrosis.

The anterior uterine wall was inflamed and friable, requiring careful blunt dissection to separate the collection up to the isthmus, which presented superficial necrosis, yet no obvious signs of uterine scar dehiscence or active bleeding were noted. On the left side of the uterine scar, a uterovesical abscess containing yellowish pus was fenestrated and drained, and a sample of pus was taken from the discharge for culture, which turned out negative. The collection was deeply infiltrating the superior and posterior bladder wall, as well as the left broad ligament, and was debrided appropriately and sent for pathological examination. The surgical approach involved extensive debridement, which required a partial cystectomy (figure 4) and total hysterectomy, completed with bilateral salpingectomy.

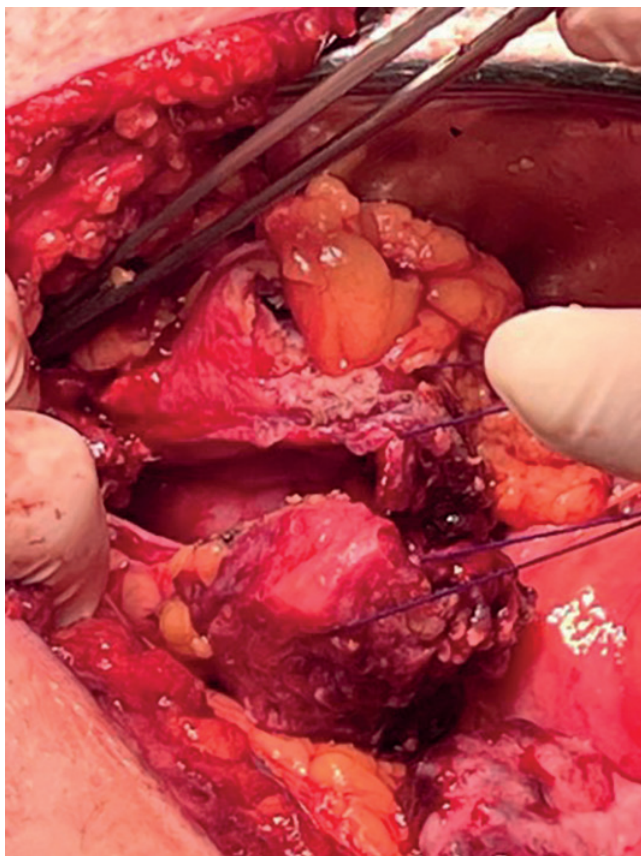


Figure 4. Intraoperative appearance of partial cystectomy due to extensive bladder wall infiltration and necrotic tissue requiring debridement

The bladder defect and the vagina were closed with number 1 polyglactin absorbable suture. The watertight closure of the bladder wall was checked with normal saline distention. After peritoneal cavity lavage and thorough hemostasis, drainage was placed in the Retzius space and peritoneal space.

The postoperative course was uneventful, antibiotics and anti-inflammatory drugs were continued, and a gradual improvement in the levels of inflammation markers was observed. The patient was discharged on the 7th post-operative day with a Foley catheter in place and was monitored in outpatient service.

The pathological examination of the excised collection found conjunctive-adipose tissue with areas of abscess (figure 5A), the left fallopian tube presented inflammatory changes of acute salpingitis, the

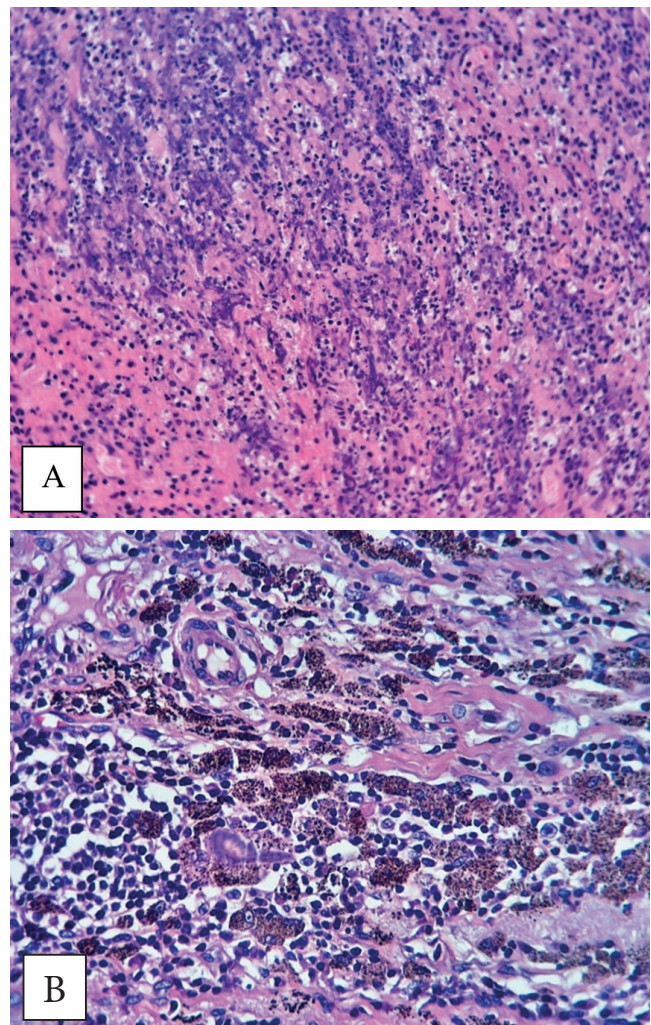


Figure 5. Microscopy images showing an area of acute suppurative inflammation at 20x magnification (A); an area with intracytoplasmic pigment deposits and amorphous material at 40x magnification (B).

parameters and isthmic myometrium contained macrophages loaded with blackish pigment most probably from sutures in previous surgery at this level (figure 5B). Deposits of fibrillar material and amorphous, acellular structures suggestive of foreign material surround the described macrophages. One fragment of the abscess bed contained a nest of hyperchromatic epithelial cells with a slightly atypical appearance, without meeting the criteria for a malignant lesion and considered a mesonephric remnant with reactive changes. The endocervical mucosa presented lesions of acute chronic papillary endocervicitis, while in the intern myometrium isolated foci of uterine adenomyosis were noted.

Atypical fibroblastic changes were found around the suppurative inflammation area and were further evaluated through immunohistochemistry (figure 6A, 6B, 6C) that confirmed reactive inflammatory remodeling, without neoplastic proliferation.

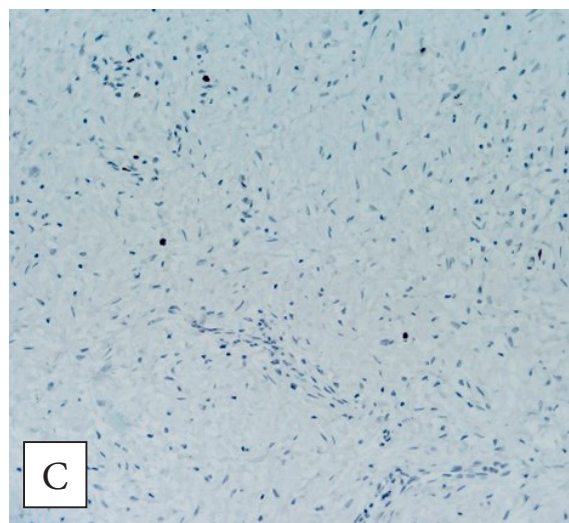
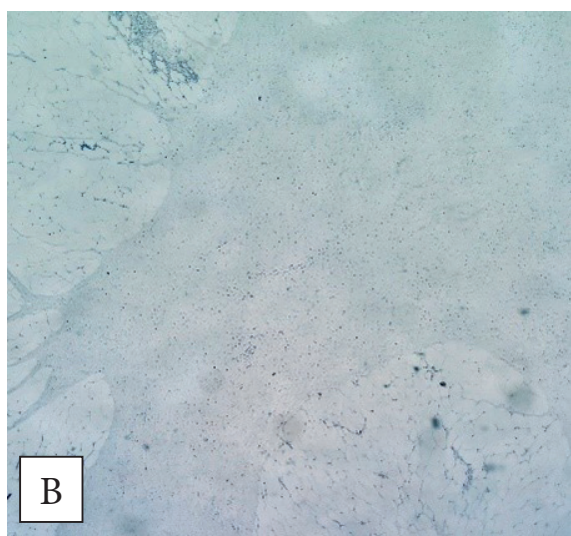
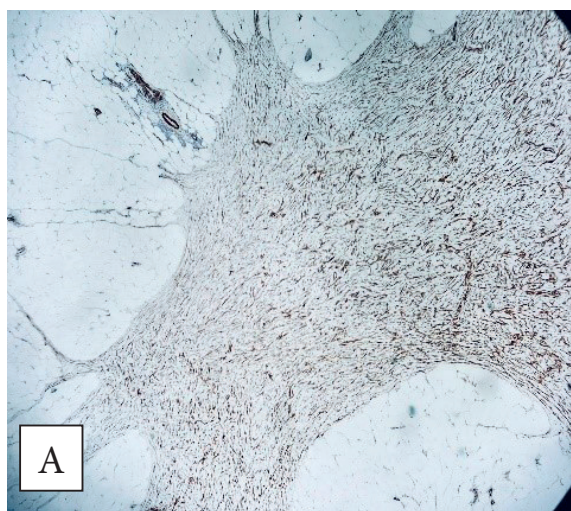


Figure 6. Immunohistochemistry result: CD34 slight positive highlights the fibroblastic/myofibroblastic nature of the cells (A), ALK - no reactivity (B), proliferative index ki67 – reduced reaction (C).

The bladder catheter was removed 4 weeks later, after bladder exercise. The patient underwent a retrograde cystography (figure 7) confirming no postoperative lesions or bladder leak.

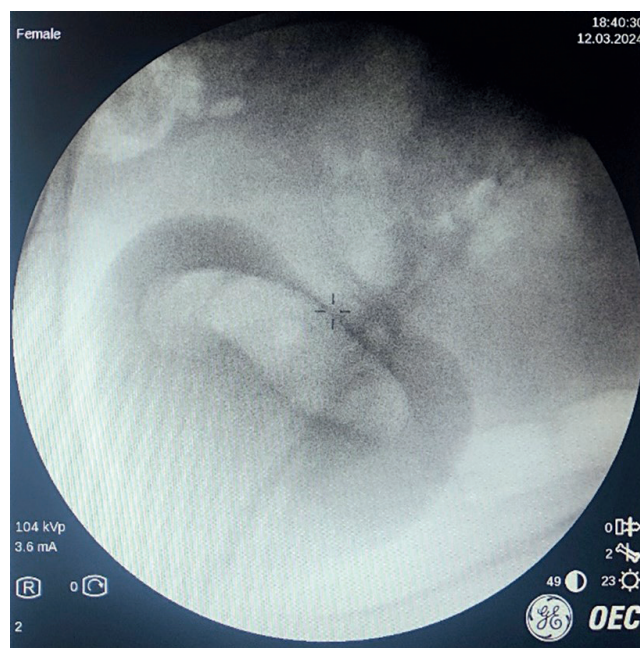


Figure 7. Cystography image showing the integrity of the bladder wall.

DISCUSSIONS

Pelvic abscesses typically involve the adnexa and rectouterine space, while the uterovesical pouch is a very uncommon site for complicated pelvic inflammatory disease.

Most case reports in literature describe uterovesical abscesses occurring in the puerperium after cesarean delivery usually associated with uterine scar dehiscence and iatrogenic urinary tract lesions. Antibiotic prophylaxis decreases the rate of postcesarean infection by 60% to 70%², with postpartum endometritis complicating <0.1% of all cesarean deliveries. Consequently, life-threatening uterovesical abscesses are rarely seen and are described usually as bladder-flap hematoma, secondary to iatrogenic lesions during the closure of the visceral peritoneum^{3,4}. The omission of routine bladder flap formation before uterine incision as well as the non-closure of the visceral peritoneum may currently be a weak recommendation to prevent bladder flap hematoma and reduce maternal morbidity⁵, further large, randomized trials being necessary to address the issue.

Long-term CS complications as potential etiology of uterovesical abscess include scar-related lesions, urogenital fistula, and endometriosis in unusual locations.

The uterine scar after a cesarean section can heal inappropriately and lead to scar endometriosis, isthmocele or full-thickness myometrial defect and intramyometrial abscesses.

Scar endometriosis is suspected to result from iatrogenic inoculation of the endometrium at the level of the incision site⁶. Further metaplasia of the surrounding fascial tissue is linked to mass formation inside or near the uterine scar, which can cause periodic pain with menses⁷ and usually requires surgical excision.

Uterine isthmocele or niche is a myometrial defect that communicates with the endometrial cavity. Although most patients are asymptomatic, some may present postmenstrual spotting and pelvic pain, with potential severe long-term complication like secondary infertility, scar pregnancy or uterine rupture in subsequent pregnancy⁸. On ultrasound exam, an anechoic triangular defect is seen communicating with the endometrial cavity and covered by thinned-out myometrium in the lower segment of the anterior uterine wall. It is conventionally considered large if >50% of the myometrial thickness is involved⁹. In selected cases, MRI can be necessary for accurate diagnosis and presurgical planning and it shows an outpouching filled with

fluid that is hyperintense on T1 and hypointense on T2-weighted images, suggestive of blood¹⁰. Minimally invasive resection through hysteroscopy in small isthmocele¹¹ or laparoscopy for larger defects have good therapeutic results¹².

In very rare cases, this collection of fluid can be a promoting factor for infection and scar abscess, including many years after CS. Differential diagnoses, including necrotic fibroid and myosarcoma, can be ruled out through hysteroscopy and endometrial biopsy. The treatment of a scar abscess was classically done by hysterectomy¹³, but new conservative approaches tend to be used. Antibiotic therapy alone rarely leads to complete resolution¹⁴, minimally invasive approaches include percutaneous, transrectal, and transvaginal aspiration under ultrasound guidance¹⁵. For refractory abscesses, laparoscopy represents the next therapeutic step. Moreover, a successful combined laparoscopic and hysteroscopic approach was reported for a scar abscess six years after CS¹⁶.

Disruption of a cesarean scar can cause a uterovesical space hematocele that can mimic abscess endometrioma. The hematocele presents as an extrauterine-encapsulated collection of altered blood that communicates with the endometrial cavity through a full-thickness myometrial discontinuity and usually does not infiltrate the bladder wall. Hysteroscopy can confirm the diagnosis and the myometrial defect can be repaired through laparoscopy¹⁷.

Vesicouterine fistula is another potential cause of uterovesical mass, commonly observed as a complication of lower uterine segment cesarean section. This complication represents less than 5% of urogenital fistulas¹⁸ and can also develop after assisted vaginal deliveries or certain gynecological interventions (hysteroscopy, dilatation and curettage, irradiation, intrauterine device insertion). Delayed VUF formation may result from infection, devascularization, or hematoma of the urinary bladder¹⁹. After a cesarean section, the bladder can get adherent to the uterus and thus subjected to severe tension. Moreover, repeated cesarean sections may result in extended vascular injury, progressive devitalization, and scarring of the bladder base. VUFs may appear in different clinical presentations like amenorrhea, cyclic hematuria, pelvic pain, secondary infertility, and recurrent pregnancy losses. Regarding the urinary incontinence, which is constant in vesicovaginal fistulas, in the VUFs this is related to the fistula tract opening below the isthmus level and is lacking in the classical

Youssef's syndrome. The double echogenic line between the anterior uterine wall and the posterior wall of the bladder in the ultrasound may suggest a VUF. In contrast to vesicovaginal fistulas, cystography in VUF may be nondiagnostic as intrauterine pressure is higher than intravesical pressure. Cystoscopy is a basic tool for the diagnosis and exclusion of other possible lesions, as well as the determination of fistula relation to the trigone. MRI is regarded as the gold standard for the diagnosis and planning of treatment²⁰. Spontaneous closure can occur in 5% of cases, conservatory treatment can be a valid option for small fistulas applying bladder catheterization for 4–8 weeks and induced amenorrhea. Yet, the definitive treatment in VUF is surgery and may be carried out via vaginal, transvesical, transperitoneal, laparoscopic, and robotic route²¹.

The uterovesical abscess can also be a complication of superinfected endometriotic lesions located on the peritoneal surface or the urinary bladder. Superinfection of endometriotic lesions can result by direct inoculation after a surgical procedure (most commonly oocyte retrieval), but also by ascending route from low genital tract infection, hematogenous spread, extension from adjacent bowel or spontaneous rupture of endometrioma. An uterovesical abscess was reported after oocyte retrieval in a patient with a rare cystic endometriotic lesion in the vesico-uterine pouch that was thought to originate in an aberrant portion of the Müllerian duct²². Endometriosis of the bladder is often limited to the serosal surface of the posterior wall. Consequently, the suppurative mechanism in such uterovesical abscess usually starts from the serosa of the vesical dome and rarely infiltrates through the muscular layer to reach the mucosa. In the absence of cyclic hematuria associated with mucosa ulcerations, the symptoms can mimic acute cystitis. MRI has high specificity for bladder endometriosis²³ usually describing uterine adenomyosis-like solid lesions with no cystic lesions, presenting low T2 signal intensity. Superinfected bladder endometriosis is suggested by the increase in the size of a known lesion, along with loss of hyperintensity in T1WFS, inflammatory signs and restriction of diffusion²⁴. Furthermore, nodular endometriotic lesions can be differentiated from bladder cancer based on the identification of internal foci of high T1 and high T2 signal intensity, which is pathognomonic of endometriosis²⁵.

In our case, the previous transvaginal ultrasound was performed two years ago without showing an obvious isthmocele and the patient did not present continuous

postmenstrual bleeding or spotting, a common symptom of the spectrum of cesarean scar defects. Yet, our operative finding demonstrating dense fibrotic adhesions between the parietal abdominal wall, bladder and uterus could have caused upward retraction force and scar defective healing. Moreover, the pathology exam found foamy macrophages loaded with pigment and surrounded by deposits of fibrillar and amorphous material, related to material suture, which could favor inflammatory changes. Therefore, we suspect an infinitesimal cesarian scar defect or scar thinning due to iterative interventions on the uterine isthmus with consecutive minimal extravasation of menstrual bleeding in the vesicouterine space. We note in the patient's history a premature birth and bacterial vaginosis, but currently negative urine culture and genital swabs. If we consider the infectious factor as one of the main causes of premature birth and rely on the reported acute symptomatology which is consistently related to pelvic inflammation, we could advance the diagnosis of a superinfected hematocele mimicking VU fistula, uterovesical endometriosis or a malignant entity. Differential diagnoses were ruled out through MRI and tumoral marker level (endometriosis), cystoscopy (VU fistula) and intraoperative pathological exam revealing extended abscess.

Late presentation after CS, apyrexia, persistent suprapubic pain and lack of changes on ultrasound under antibiotics and anti-inflammatories guided us towards surgical treatment with intraoperative histopathology instead of hysteroscopy or drainage through interventional radiology, considering the risk of malignancy.

The deep infiltration of the bladder wall in preoperative imagistic investigations made us perform the surgery in multidisciplinary team and it proved favorable as partial cystectomy and bladder repair was necessary.

We consider our experience of aid for practice as there is scarce evidence of this pathological entity in the literature and patient counseling toward a benign condition rather than a malignant entity is of help in case management.

CONCLUSIONS

We report an unusual presentation of uterovesical abscess eight years after cesarean surgery in a young patient with no recent infection confirmed. Such long-term complication of cesarean section is expected to become more prevalent since the cesarean delivery rate is steadily increasing worldwide. Acknowledge

of rare pathologic entities involving the uterovesical space is important for prompt diagnosis and therapeutic planning. Conservative treatment cannot always be achieved and for extensive inflammatory process multi-disciplinary surgical team should be preferred.

Consent. Consent taken from patient for publication of case report.

Data Availability. The data used to support the findings of this study are included within the article.

References

- Lata K, Davis AA, Panwar A, Kriplani I, Kriplani A. *Laparoscopic Management of Post-cesarean Uterovesical Abscess: A New Approach to an Old Problem.* **J Obstet Gynaecol India.** 2021 Jun;**71(3):313-317.** doi: 10.1007/s13224-020-01396-4. Epub 2020 Nov 18. PMID: 34408352; PMCID: PMC8310807.
- Smaill FM, Grivell RM. *Antibiotic prophylaxis versus no prophylaxis for preventing infection after cesarean section.* **Cochrane Database Syst Rev.** 2014 Oct 28;**2014(10):CD007482.** doi: 10.1002/14651858.CD007482.pub3. PMID: 25350672; PMCID: PMC8078551.
- Murayama Y, Tanaka T, Maruoka H, Daimon A, Ueda S, Ohmichi M. *Pelvic Abscess after Cesarean Section Treated with Laparoscopic Drainage.* **Case Rep Obstet Gynecol.** 2021 Jun 10;**2021:8868608.** doi: 10.1155/2021/8868608. PMID: 34221524; PMCID: PMC8213458.
- Phipps MG, Watabe B, Clemons JL, Weitzen S, Myers DL. *Risk factors for bladder injury during cesarean delivery.* **Obstet Gynecol** 2005;**105:156-60.**
- Sentilhes L, Schmitz T, Madar H, Bouchghoul H, Fuchs F et al. *La technique de la césarienne: recommandations pour la pratique clinique du Collège national des gynécologues obstétriciens français [The cesarean procedure: Guidelines for clinical practice from the French College of Obstetricians and Gynecologists].* **Gynecol Obstet Fertil Senol.** 2023 Jan;**51(1):7-34.** French. doi: 10.1016/j.gofs.2022.10.002. Epub 2022 Oct 11. PMID: 36228999.
- Poudel D, Acharya K, Dahal S, Adhikari A. *A case of scar endometriosis in cesarean scar: A rare case report.* **Int J Surg Case Rep.** 2023 Jan; **102:107852.** doi: 10.1016/j.ijscr.2022.107852. Epub 2022 Dec 28. PMID: 36584626; PMCID: PMC9827051.
- Esquivel-Estrada V, Briones-Garduno JC, Mondragon-Ballesteros R. *Endometriosis implant in cesarean section surgical scar.* **Cir Cir** 2004; **72:** 113–115.
- Albu AR, Gradinaru DM, Secara D, Branescu D et al. *Ultrasound in Obstetrical and Gynecologic Emergencies, Medicina Moderna - Modern Medicine, 2022; 29 (4) 279-288.* <https://doi.org/10.31689/rmm.2022.29.4.279>.
- Oflili-Yebovi D, Ben-Nagi J, Sawyer E, et al. *Deficient lower segment cesarean section scars: prevalence and risk factors.* **Ultrasound Obstet Gynecol** 2008;**31(01):72–77.**
- Rupa R, Kushvaha S, Venkatesh K. *Uterine Isthmocele-A Frequently Overlooked Complication of Cesarean Sections.* **Indian J Radiol Imaging.** 2021 Oct 26;**31(3):601-604.** doi: 10.1055/s-0041-1736393. PMID: 34790304; PMCID: PMC8590568.
- Abacjew-Chmylko A, Wydra DG, Olszewska H. *Hysteroscopy in the treatment of uterine cesarean section scar diverticulum: a systematic review.* **Adv Med Sci** 2017;**62(02):230–239.**
- Vervoort A, Vissers J, Hehenkamp W, Brölmann H, Huirne J. *The effect of laparoscopic resection of large niches in the uterine caesarean scar on symptoms, ultrasound findings and quality of life: a prospective cohort study.* **BJOG** 2018;**125(03):317–325**
- Taguchi T, Mabuchi S, Kimura T, Kimura T. *Cesarean scar abscess: a case report and a review of the literature.* **Open J Obstet Gynecol** (2012) **2(03):244.** doi:10.4236/ojog.2012.23050.
- Boukrid M, Dubuisson J. *Conservative Management of a Scar Abscess formed in a Cesarean-induced Isthmocele.* **Front Surg.** 2016 Feb **16;3:7.** doi: 10.3389/fsurg.2016.00007. PMID: 26909351; PMCID: PMC4754412.
- Chen CP, Wang MH, Yeh LF, Wang W. *Rapid diagnosis and treatment of post-cesarean parametrial abscess by transabdominal ultrasoundguided needle aspiration.* **Ultrasound Obstet Gynecol.** 2000; **15:343–344.**
- Diaz-Garcia C, Estelles JG, Escriva AM, Mora JJ, Torregrosa RR and Sancho JM., *Scar abscess six years after cesarean section: laparoscopic and hysteroscopic management.* **Journal of Minimally Invasive Gynecology,** vol. 16, no. 6, pp. 785–788, 2009. <https://doi.org/10.1016/j.jmig.2009.07.020>
- Datta S, Basu R. *Disruption of Cesarean Scar with Uterovesical Space Hematocele Mimicking an Endometrioma.* **Women's Health Rep (New Rochelle).** 2022 May 2;**3(1):473-475.** doi: 10.1089/whr.2021.0152. PMID: 35651997; PMCID: PMC9148649.
- Keskin MZ, Budak S, Can E and Ilbey YO, *Incidentally diagnosed post-cesarean vesicouterine fistula (Youssef 's syndrome),* **Journal of the Canadian Urological Association,** vol. 9, no. 11-12, pp. E913–E915, 2015.
- Porcaro AB, Zicari M, Zecchini Antonioli S, Pianon R, Monaco C, Migliorini F, Longo M, Comunale L. *Vesicouterine fistulas following cesarean section: report on a case, review and update of the literature.* **Int Urol Nephrol.** 2002;**34(3):335-44.** doi: 10.1023/a:1024443822378. PMID: 12899224.
- Mellano EM and Tarnay CM, *Management of genitourinary fistula,* **Current Opinion in Obstetrics and Gynecology** 2014, **26 (5), pp. 415–423.**
- Bonavina G, Busnelli A, Acerboni S, Martini A, Candiani M, Bulfoni A. *Surgical repair of post-cesarean vesicouterine fistula: A systematic review and a plea for prevention.* **Int J Gynaecol Obstet.** 2023 Dec 6. doi: 10.1002/ijgo.15256. Epub ahead of print. PMID: 38055313.
- Matsuda S, Akira S, Kaseki H, Watanabe K, Ono S, Ichikawa M, Takeshita T. *A Case of an Abscessed Cystic Endometriotic Lesion in the Vesico-uterine Pouch after Oocyte Retrieval.* **Gynecol Minim Invasive Ther.** 2021 Nov 5;**10(4):252-255.** doi: 10.4103/GMIT.GMIT_12_20. PMID: 34909384; PMCID: PMC8613484.
- Radu A and Bratila E. *A Study of the Sensitivity and Specificity of the Magnetic Resonance Imaging (MRI) Technique used in the Diagnosis of Endometriosis versus the Intraoperative Appearance Considered the Reference Standard in the Diagnosis of Endometriosis.* **Medicina Moderna - Modern Medicine** 2021, **28(1) 55-61.** <https://doi.org/10.31689/rmm.2021.28.1.55>.
- Tran-Harding K, Nair RT, Dawkins A, et al. *Endometriosis revisited: an imaging review of the usual and unusual manifestations with pathological correlation.* **Clin Imaging.** 2018;**52:163–171.** doi: 10.1016/j.clinimag.2018.07.017.
- Leonardi M, Espada M, Kho RM et al (2020) *Endometriosis and the urinary tract: from diagnosis to surgical treatment.* **Diagn Basel Switz** 10(10):771.