

Contents lists available at [ScienceDirect](#)

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Ovarian vein thrombosis after total laparoscopic hysterectomy with unilateral adnexectomy: A case report



Samer Nikolaos Al-Achmar*, Sofoklis Stavrou, Athanasios Protopapas, Peter Drakakis, Panagiota Siemou, Ioannis Chatzipapas

1st OB.GYN Department, School of Medicine, National and Kapodistrian University of Athens, Alexandra Hospital, Lourou and Vasilissis Sofias Ave., 11528 Athens, Greece

ARTICLE INFO

Article history:

Received 31 July 2017

Received in revised form 7 September 2017

Accepted 19 September 2017

Available online 4 October 2017

Keywords:

Ovarian vein thrombosis

Laparoscopy

Hysterectomy

Case report

ABSTRACT

INTRODUCTION: Ovarian vein thrombosis is a rare but potentially serious complication after surgical and gynecologic procedures such as oophorectomy and hysterectomy. The association of this event with laparoscopic hysterectomy in particular, is very rare. Only two cases have been described so far.

PRESENTATION OF CASE: We present a case of ovarian vein thrombosis after laparoscopic hysterectomy in a 40-year-old with deep endometriosis and multiple intramural uterine myomas. Laparoscopic hysterectomy, left oophorectomy, right salpingectomy, and suspension (ovariopexy) of the right ovary on the ipsilateral round ligament of the uterus were performed, using bipolar electrocautery as a hemostatic tool.

DISCUSSION: The 7th postoperative day the patient presented to our hospital complaining of abdominal pain and fever. An abdominal CT scan demonstrated a filling defect and enlargement of the right ovarian vein, a finding compatible with ovarian vein thrombosis. She was treated with low molecular weight heparin (LMWH). On the 19th postoperative day, an MRI scan was performed and did not reveal any pathological findings of the right ovarian vein. The patient was discharged on LMWH for three months. Post treatment evaluation for thrombophilia was negative for pathological findings.

CONCLUSION: Our case is a very rare condition. Only two 'similar' cases have been described in the literature so far. Bipolar electrocautery and ovariopexy on the ipsilateral round ligament during laparoscopic hysterectomy should be evaluated further as possible contributing mechanisms for the thrombus formation.

© 2017 The Authors. Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Ovarian vein thrombosis (OVT) is a rare but potentially serious complication after surgical and gynecologic procedures such as oophorectomy and hysterectomy [1]. Nevertheless, the majority of cases have been described in the postpartum period. Clinical symptoms are vague and nonspecific, with fever and abdominal pain being its most common manifestations, making often the diagnosis

challenging. Imaging techniques like CT scan, MRI, and ultrasonography may be useful diagnostic tools. Typically, treatment includes the administration of anticoagulants and antibiotics [2]. The main purpose of this report is to present an extremely rare case, the third described in literature [3,4], of ovarian vein thrombosis in a 40-year-old woman after total laparoscopic hysterectomy due to leiomyomas and deep endometriosis. We argue that the surgical technique and the thermal damage caused by the bipolar electrocautery, should be taken into consideration as potentially etiopathogenic mechanisms of ovarian vein thrombosis. This work has been reported in line with the SCARE criteria [5].

2. Case summary

A 40-year-old woman, gravida 2, para 2 presented to our unit complaining of mild intermenstrual vaginal spotting and dyspareunia. Her gynecological past medical history included a left

* Corresponding author at: Resident in Obstetrics and Gynecology, 'Alexandra General Hospital', First Department of Obstetrics and Gynecology, School of Medicine, National and Kapodistrian University of Athens, Lourou and Vasilissis Sofias Ave., 11528 Athens, Greece.

E-mail addresses: nikossamer@hotmail.com (S.N. Al-Achmar), sfstavrou@yahoo.com (S. Stavrou), prototha@otenet.gr (A. Protopapas), pdrakakis@hotmail.com (P. Drakakis), psiemou@gmail.com (P. Siemou), ixatzipapas@yahoo.gr (I. Chatzipapas).

laparoscopic salpingectomy due to hydrosalpinx and concurrent cauterization of posterior vaginal fornix endometriosis, 4 years ago. No other pathology or chronic drug use was reported and there was no family history of thrombophilia. She had never received oral contraceptives or any hormonal therapy in the past. Her BMI was 24.8 kg/m².

On admission, gynecological examination revealed tenderness in the pouch of Douglas, her cervix was firm, and vaginal bleeding was noted. Her laboratory workup was normal, she had a temperature of 36.3 °C, her blood pressure was 134/73 mmHg, and her pulse rate was 88 beats/min. Abdominopelvic MRI showed two deep endometriotic nodules infiltrating the posterior vaginal fornix and upper part of the rectovaginal diaphragm, and multiple intramural uterine myomas.

Given the MRI findings and her clinical presentation, she was scheduled and treated with total laparoscopic hysterectomy, left oophorectomy and right salpingectomy, followed by suspension of the right ovary on the ipsilateral round ligament of the uterus. Prior to the hysterectomy, a partial vaginectomy to excise the nodule was performed. The rectovaginal nodule was excised en bloc with the previous lesion after detaching it from the bowel serosa. Pelvic adhesiolysis was also performed.

The patient was hospitalized for 4 days and she was discharged on the 5th postoperative day in good condition. She was prescribed postoperatively tinzaparin (low molecular weight heparin; LMWH) 4500IU subcutaneously (sc) once daily for twenty days.

On the 7th postoperative day, the patient was readmitted with complaints of abdominal pain localized on the right iliac fossa. She had a temperature of 37.7 °C, her blood pressure was 125/72 mmHg, and her pulse rate was 92 beats/min. Her admission laboratory tests were within normal limits. An abdominal CT scan revealed a filling defect and enlargement of the right ovarian vein, a finding consistent with ovarian vein thrombosis (Fig. 1). Given that the patient was under anticoagulant **prophylaxis** at the time, a complete thrombophilia work up was not performed as several hematologic analysis would have been unreliable. She was administered sc enoxaparin 6000 IU sc bid. Anti-Xa serum levels were measured to ensure therapeutic levels.

On the 19th postoperative day, an MRI scan was performed to evaluate the ovarian vein status and the results of anticoagulant therapy. The MRI did not reveal any pathological findings of the right ovarian vein and the blood tests were within normal range. The patient was discharged on the 20th postoperative day without any symptoms and she was continued on enoxaparin 4000 IU bid for three months. After completion of her anticoagulant therapy, she underwent an extensive evaluation for thrombophilia which did not reveal any clinically significant findings.

3. Discussion

Virchow's triad of venous stasis, endothelial wall injury and hypercoagulability may lead to thrombus formation [3]. OVT was first described in 1909 by Vineberg [6]. Ovarian veins are located anatomically by the ovaries and fallopian tubes, and they originate from the vascular plexus of the broad ligament [4]. On the right side, the ovarian vein drains directly into the inferior vena cava, while the left one into the left renal vein [7]. OVT develops on the right side in 70–90% of patients, while both ovarian veins can be implicated in 11–14% of the cases. The higher incidence on the right side can be explained by the longer length of the ovarian vein and the lack of competent valves [8].

The symptoms are often nonspecific and may include fever (80%), abdominal pain more often located on the right side and associated with flank and back pain. Common clinical and laboratory findings may include leukocytosis, tachycardia, vomiting

and nausea. It can be difficult to distinguish these symptoms from other causes that mimic OVT such as appendicitis, irritable bowel disease, endometritis, hydronephrosis, pyelonephritis, hematoma, tubo-ovarian abscess, and adnexal torsion [2,3]. OVT can lead to life-threatening complications such as extension of the thrombus into the inferior vena cava and pulmonary embolism which may occur in 25% of untreated patients [8].

OVT may be associated with conditions such as pelvic inflammatory disease, malignancy, inflammatory bowel disease, sepsis, and pelvic or abdominal surgery [8]. Thrombophilia may act as a risk factor for its development [9]. In gynecology, OVT can occur after laparotomy, uterine prolapse and malignancies [3]. In obstetrics, OVT is a rare entity which affects 0.05–0.018% of postpartum women after vaginal delivery and 1–2% after caesarian section [2]. The first seven days postpartum are of increased risk for its occurrence. [10] Idiopathic OVT is a very rare condition that has been reported in a small number of cases [8].

According to the literature, the cases of OVT in association with hysterectomy for benign lesions are rare; especially, the association with laparoscopic hysterectomy is very unusual and only two cases have been described so far [3,4]. Richter et al. demonstrated that bipolar vessel sealing systems carry an increased risk of adjacent tissue thermal damage, and vein wall trauma [4,11]. In our case the use of bipolar electrocautery may indeed have contributed to OVT. In addition, ovariopexy on the ipsilateral round ligament and the consecutive stretching of the infundibulopelvic ligament may have influenced the blood flow into the vessels, provoking the development of a thrombus. The technique of ovariopexy has been well described in the literature and is recommended especially during laparoscopic hysterectomy. It involves creation of a window of the posterior leaf of the broad ligament to isolate and pedunculate the infundibulopelvic ligament, and is performed in order to reduce the risk of torsion in cases of ovarian preservation, and to have an easily identifiable ovary for postoperative imaging follow-up [12].

Before the development of modern imaging techniques, the diagnosis of OVT was based on laparotomic evaluation or a heparin test [12]. Nowadays, ultrasonography, magnetic resonance angiography, and CT scan can be used for its diagnosis [9]. However, ultrasonographic imaging is a poor method of OVT detection, because the whole length of the vein may not be identifiable due to increased BMI and the postoperative bowel distension. More specifically, the color score ultrasound technique is associated with low sensitivity (55.6%), low specificity (41.2%), and low accuracy (46.2%). On the other hand, MRI is associated with high accuracy, up to 100%, in OVT diagnosis [13]. Despite the fact that abdominal CT scan has lower sensitivity (77.8%) and specificity (62.5%) compared to MRI, due to its rapid access and lower cost it is commonly used as the 'first line' diagnostic method [8,9,13].

Treatment of OVT is controversial and there is no standard evidence – based protocol. Anticoagulation therapy and use of intravenous antibiotics remain the mainstay for its treatment [4]. First, with respect to anticoagulation therapy there is no consensus on standard dosage, duration, or therapeutic agent [9]. Most patients are initially treated with heparin intravenously, followed by warfarin [8]. In most studies, patients are treated with heparin (LMWH or unfractionated) for three to six months, and a vitamin K antagonist for maintenance. When septic thrombophlebitis is suspected, antibiotics are often prescribed. The duration is based on the response to treatment and it lasts from 2 days to 7 days. Different agents may be used such as: a β -lactam antibiotic with β -lactamase inhibitor, a second- third generation cephalosporin with metronidazole, gentamycin, and clindamycin [9].

Overall, OVT is a rare complication of pelvic surgery and minimally invasive procedures in particular, but requires a high clinical index of suspicion due to its nonspecific symptoms. Abdominal CT scan and anticoagulant therapy are often used for the diagnosis and

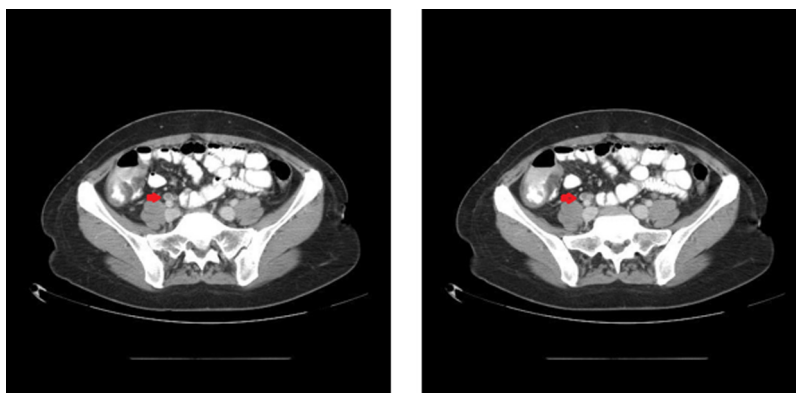


Fig. 1. Abdominopelvic Computed Tomography scans; filling defect – thrombus and enlargement of the right ovarian vein. (Red arrow).

treatment of OVT, respectively. The application of bipolar electrocautery **in combination with** ovariopexy on the ipsilateral round ligament during laparoscopic hysterectomy should be furthermore evaluated as possible contributing mechanisms for the thrombus formation.

Conflict of interest statement

The authors of this paper certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Please state any sources of funding for your research

NA.

Ethical approval

IRB/Ethics Committee ruled that approval was not required for this study

Consent

Written informed consent was obtained from the patient, and this has been stated in the manuscript per the submission instructions.

Author contribution

conception and design of study: Ioannis Chatzipapas, Samer Nikolaos Al-Achmar, Sofoklis Stavrou.

acquisition of data: Samer Nikolaos Al-Achmar, Sofoklis Stavrou.
analysis and/or interpretation of data: Samer Nikolaos Al-Achmar, Sofoklis Stavrou.

drafting the manuscript: Samer Nikolaos Al-Achmar, Sofoklis Stavrou, Athanasios Protopapas, Peter Drakakis, Panagiota Siemou, Ioannis Chatzipapas.

revising the manuscript critically for important intellectual content: Athanasios Protopapas, Peter Drakakis, Panagiota Siemou, Ioannis Chatzipapas.

approval of the version of the manuscript to be published: Samer Nikolaos Al-Achmar, Sofoklis Stavrou, Athanasios Protopapas, Peter Drakakis, Panagiota Siemou, Ioannis Chatzipapas.

Guarantor

Samer Nikolaos Al-Achmar.
Sofoklis Stavrou.
Athanasios Protopapas.
Peter Drakakis.
Panagiota Siemou.
Ioannis Chatzipapas.

References

- [1] Suzane O'HAGAN, et al., Ovarian vein thrombosis – a rare but important complication of hysterectomy and oophorectomy, *South African J. Obstet. Gynaecol.* 19 (September (3)) (2013) 86–87 (ISSN 2305-8862).
- [2] B.F. Khishfe, A. Sankovsky, I. Nasr, Idiopathic ovarian vein thrombosis: a rare cause of abdominal pain, *Am. J. Emerg. Med.* 34 (May (5)) (2016) 935, <http://dx.doi.org/10.1016/j.ajem.2015.09.022> (e1-2).
- [3] Y. Tanaka, H. Kato, A. Hosoi, M. Isobe, S. Koyama, Y. Shiki, Ovarian vein thrombosis following total laparoscopic hysterectomy, *Asian J. Endosc. Surg.* 5 (November (4)) (2012) 179–182, <http://dx.doi.org/10.1111/j.1758-5910.2012.00147.x>.
- [4] A. Takeda, Y. Yamase, W. Koike, S. Hayashi, S. Imoto, H. Nakamura, Pulmonary thromboembolism as a result of ovarian vein thrombosis after laparoscopic-assisted vaginal hysterectomy for uterine myoma, *J. Obstet. Gynaecol. Res.* 42 (June (6)) (2016) 743–747, <http://dx.doi.org/10.1111/jog.12973>.
- [5] R.A. Agha, A.J. Fowler, A. Saetta, I. Barai, S. Rajmohan, D.P. Orgill, The SCARE Group, The SCARE statement: consensus-based surgical case report guidelines, *Int. J. Surg.* 34 (2016) 180–186.
- [6] A. Rottenstreich, N. Da'as, G. Kleinstern, G. Spectre, H. Amsalem, Y. Kalish, Pregnancy and non-pregnancy related ovarian vein thrombosis: clinical course and outcome, *Thromb. Res.* 5 (September (146)) (2016) 84–88, <http://dx.doi.org/10.1016/j.thromres.2016.09.001>.
- [7] A.A. Jenayah, S. Saoudi, F. Boudaya, I. Bouriel, E. Sfar, D. Chelli, Ovarian vein thrombosis, *Pan Afr. Med. J.* 21 (2015) 251, <http://dx.doi.org/10.11604/pamj.2015.21.251.6908>.
- [8] K. Harris, S. Mehta, E. Iskhakov, M. Chalhoub, T. Maniatis, F. Forte, H. Alkaied, Ovarian vein thrombosis in the nonpregnant woman: an overlooked diagnosis, *Ther. Adv. Hematol.* 3 (October (5)) (2012) 325–328, <http://dx.doi.org/10.1177/2040620712450887>.
- [9] A. Gupta, N. Gupta, J. Blankstein, R. Trester, Ovarian vein thrombosis as a complication of laparoscopic surgery, *Case Rep. Obstet. Gynecol.* 2015 (2015) 682941, <http://dx.doi.org/10.1155/2015/682941>.
- [10] S. Richter, O. Kollmar, E. Neunhoeffer, M.K. Schilling, M.D. Menger, G. Pistorius, Differential response of arteries and veins to bipolar vessel sealing: evaluation of a novel reusable device, *J. Laparoendosc. Adv. Surg. Tech. A* 16 (April (2)) (2006) 149–155.
- [11] P. Sharma, S. Abdi, Ovarian vein thrombosis, *Clin. Radiol.* 67 (September (9)) (2012) 893–898, <http://dx.doi.org/10.1016/j.crad.2012.01.013>.

- [12] N. Bourdel, X. Tran, R. Botchorhisvili, J.L. Pouly, M. Canis, G. Mage, Laparoscopic hysterectomy in 10 steps, *J. Chir. (Paris)* 146 (October (5)) (2009) 483–491, <http://dx.doi.org/10.1016/j.jchir.2009.09.008>.
- [13] V. Virmani, R. Kaza, A. Sadaf, N. Fasih, M. Fraser-Hill, Ultrasound, computed tomography, and magnetic resonance imaging of ovarian vein thrombosis in obstetrical and non obstetrical patients, *Can. Assoc. Radiol. J.* 63 (May (2)) (2012) 109–118, <http://dx.doi.org/10.1016/j.carj.2010.08.002>.

Open Access

This article is published Open Access at sciedirect.com. It is distributed under the [IJSCR Supplemental terms and conditions](#), which permits unrestricted non commercial use, distribution, and reproduction in any medium, provided the original authors and source are credited.