Acknowledgements

Patient consent form has been completed and signed by the patient.

References

[1] Guise J-M, Denman MA, Emeis C, Marshall N, Walker M, Fu R, et al. Vaginal birth after cesarean: new insights on maternal and neonatal outcomes. Obstet Gynecol 2010;115:1267–78, doi:http://dx.doi.org/10.1097/AOG.0b013e3181df925f.
[2] Gibbins KJ, Weber T, Holmgren CM, Porter TF, Varner MW, Manuck TA. Maternal and fetal morbidity associated with uterine rupture of the unscarred uterus. Am J Obstet Gynecol 2015213:, doi:http://dx.doi.org/10.1016/j.ajog.2015.05.048 382.e1-6.
[3] Guiliano M, Closset E, Therby D, LeGoueff F, Deruelle P, Subtil D. Signs, symptoms and complications of complete and partial uterine ruptures during pregnancy and delivery. Eur J Obstet Gynecol Reprod Biol 2014;179:130–4, doi:http://dx.doi.org/10.1016/j.ejogrb.2014.05.004.
[4] Rottenstreich M, Rotem R, Hirsch A, Farkash R, Samueloff A, Sela HY. Delayed diagnosis of intrapartum uterine rupture – maternal and neonatal consequences. J Matern Neonatal Med 2019;1–6, doi:http://dx.doi.org/10.1080/14767058.2019.1613366 0.
[5] Namazov A, Grin L, Volodarsky M, Anteby E, Gemer O. Laparoscopic management of uterine rupture after early second-trimester medical abortion in a patient with a prior cesarean section. J Minim Invasive Gynecol 2019;23:862, doi:http://dx.doi.org/10.1016/j.jmig.2016.04.004 n.d..

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Takotsubo cardiomyopathy occurring concomitantly with uterine rupture due to caesarian scar pregnancy: A case report

Dear Editor,

We found that Takotsubo cardiomyopathy (TCM) can be a rare manifestation of uterine rupture due to caesarian scar pregnancy (CSP). Although peripartum TCM has been previously reported, early second trimester diagnosis triggered by CSP- associated uterine rupture is an extremely rare occurrence. In this case, to the best of our knowledge, we report the first patient with TCM triggered by haemorrhage from CSP-associated uterine rupture.

A 33-year-old G3P2 healthy female at 16 weeks' gestation presented to the emergency unit with abdominal pain and vaginal bleeding. She reported a 1-day history of vaginal bleeding and abdominal pain, which on admission had localized to the hypogastric region. Vitals were unremarkable and she was afebrile. Physical assessment revealed local tenderness without guarding or rebound. Pelvic examination could not be performed. Laboratory tests showed mild anemia. However, transvaginal ultrasound demonstrated a blighted ovum adjacent to the caesarian scar.

Clinical and ultrasound findings were suggestive of CSP. In view of the increasing vaginal bleeding a dilatation and curettage (D&C) was carried out but electrocardiogram (ECG) tracing mimicking myocardial infarction was detected. Both coronary angiography and cardiac echocardiography were performed confirming the diagnosis of TCM (Fig. 1). The patient was discharged on the 43rd postoperative day following: 1) additional D&C due to excessive vaginal bleeding on the 14th postoperative day, 2) subtotal hysterectomy on the 14th postoperative day due to uncontrollable vaginal bleeding, and 3) right adnexectomy due to ipsilateral necrosis on the 28th postoperative day. Heparin induced thrombocytopenia (HIT) was diagnosed on the 16th postoperative day. The histological diagnosis was total uterine rupture due to CSP.

TCM is often triggered by emotional or physical stress but is rarely diagnosed in pregnancy. Differential diagnosis is challenging due to similar presentation to acute coronary syndrome, peripartum cardiomyopathy or pulmonary thromboembolism. Increased parity is not an independent risk factor but use of tocolytic agents during multiple pregnancies could be associated with TCM. A mean maternal age of 33 (detection range: 24–42) has been reported [1]. Most cases start perinatally and approximately 1/3 appear intraoperatively [2]. If the correct diagnosis is reached, TCM cases occurring perinatally have favorable outcome and full recovery is made within four months.

CSP has an incidence of 1:1800 to 1:2226 (0.05–0.04%) of all pregnancies but a rate of 0.15% in patients after at least one caesarean section (CS) and 6.1% of all ectopic pregnancies [3]. It is uncertain whether the risk of CSP is related to the number of previous CSs [4].

Although TCM association with pregnancy has been previously documented, it usually develops during labor or post-partum. Antenal TCM has been linked to hyperadrenergic status and synchronous preeclampsia development in 50% of all cases [5]. It is uncertain if antenatal TCM is associated with any risk factors or adverse perinatal outcome [2].

TCM in pregnancy seems to be underreported and no recurrence rate in subsequent pregnancy has been published. The pathophysiology mechanism is still not completely understood. Perioperatively, adrenergic stimulants and anticholinergics agents should be used carefully and adequate volume substitution prior to the onset of spinal analgesia should be provided. Since there are no pathognomonic symptoms, echocardiography is required for the diagnosis.

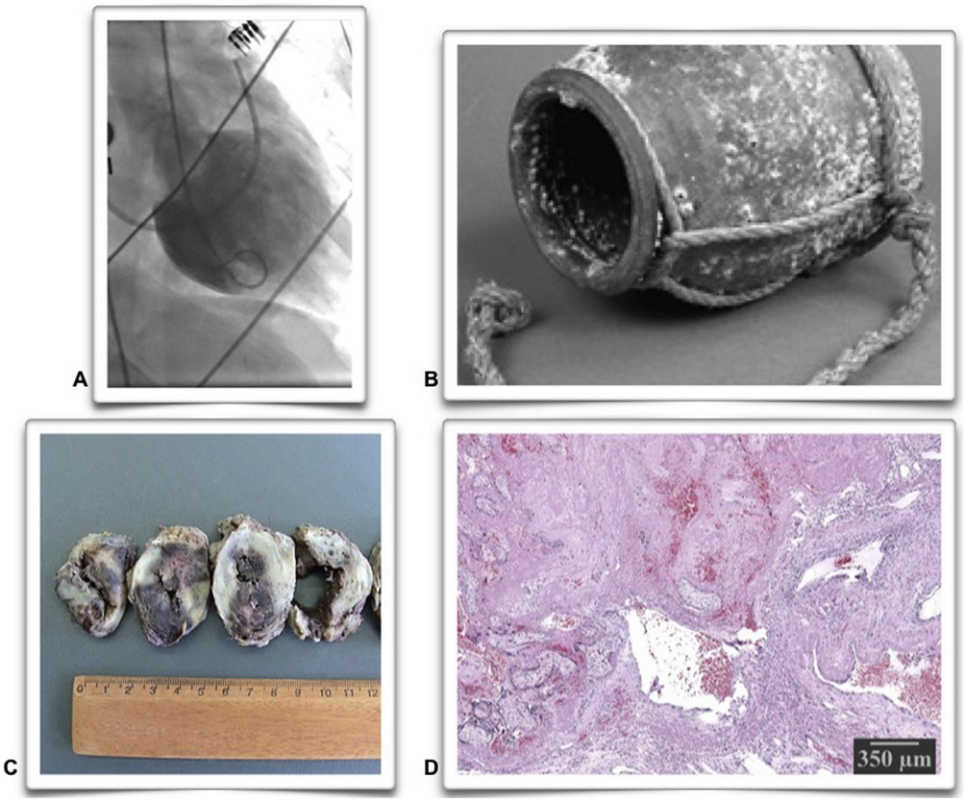

Fig. 1. End-diastolic ventriculography in the right anterior oblique projection demonstrating left ventricular apical ballooning (A); japanese octopus trap (Takotsubo) (B); macroscopic appearance of the uterine rupture (C); microscopic section demonstrating residual villi infiltrating the isthmus (D).

Declaration of Competing Interest

None.

Contributions to authorship

All authors participated and contributed to data collecting, literature review and editing the paper.

Details of ethics approval

A signed confirmation of permission form is available from the patient.

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References

[1] Ruiz S, Martinez-Marin M, Luque P, Nassar N, Oros D. Takotsubo cardiomyopathy after cesarean section: a case report and literature review. J Obstet Gynaecol Res 2017;43(February (2)):392–6Ruiz S, Martinez-Marin M, Luque P, Nassar N, Oros D. Takotsubo cardiomyopathy after cesarean section: A case report and literature review. J Obstet Gynaecol Res. 2017 Feb;43(2):392-396..

[2] Minatoguchi M, Itakura A, Takagi E, Nishibayashi M, Kikuchi M, Ishihara O. Takotsubo cardiomyopathy after cesarean: a case report and published work review of pregnancy-related cases. J Obstet Gynaecol Res 2014;40:1534–9Minatoguchi M, Itakura A, Takagi E, Nishibayashi M, Kikuchi M, Ishihara O. Takotsubo cardiomyopathy after cesarean: A case report and published work review of pregnancy-related cases. J ObstetGynaecol Res 2014; 40: 1534–1539..

[3] Jurkovic D, Hillaby K, Woelfer B, Lawrence A, Salim R, Elson CJ. First trimester diagnosis and management of pregnancies implanted into the lower uterine Caesarean section scar. Ultrasound Obstet Gynecol 2003;21:220–7Jurkovic D, Hillaby K, Woelfer B, Lawrence A, Salim R, Elson CJ. First trimester diagnosis and management of pregnancies implanted into the lower uterine Caesarean section scar. Ultrasound Obstet Gynecol 2003;21:220–7..

[4] Ash A, Smith A, Maxwell D. Caesarean scar pregnancy. BJOG 2007;114:253–63Ash A, Smith A, Maxwell D. Caesarean scar pregnancy. BJOG. 2007;114:253–263..

[5] Horie K, Takahashi H, Fujimoto Y, Kaneko D, Yada Y, Matsubara S. Takotsubo syndrome occurring concomitantly with pre-eclampsia: a case report. J Obstet Gynaecol Res 2019;45(May (5)):1071–5Horie K, Takahashi H, Fujimoto Y, Kaneko D, Yada Y, Matsubara S. Takotsubo syndrome occurring concomitantly with pre-eclampsia: A case report. J Obstet Gynaecol Res. 2019 May;45(5):1071-1075..

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Table 1
Demographic, baseline and labor characteristics of parturients with revision diagnosis versus missing of uterine rupture, results from univariate analysis.

	Revision diagnosis of uterine rupture N = 7	Revision missed diagnosis N = 10	
Maternal age (Years, Mean ± SD)	36.7 ± 2.4	33.2 ± 3.7	.044
Previous cesarean delivery or uterine surgery N (%)	4 (57.1)%	3 (30%)	.292
Diabetes (pre-gestational + gestational) N (%)	0 (0%)	0 (0%)	N/A
Hypertensive disorders	0 (0%)	0 (0%)	N/A
Labor induction N (%)	3 (42.9%)	3 (30%)	.612
Epidural analgesia during labor N (%)	4 (57.1)%	8 (80%)	.339
Vacuum extraction N (%)	3 (42.9%)	5 (50%)	.788
Hysterectomy N (%)	4 (57.1)%	4 (40%)	.517
Puerperal Fever N (%)	2 (28.6%)	4 (40%)	.653
Blood transfusions N (%)	5 (71.4%)	8 (80%)	.704

SD - standard deviation.

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Manual revision of uterine cavity for postpartum diagnosis of uterine rupture★

Dear Editor,

Intrapartum uterine rupture diagnosed following a vaginal delivery is not a common event. In about one-fifth of all cases it is diagnosed during the early postpartum period [1,2].

It was previously reported that 32.7% of women (17/52) with complete or partial uterine rupture were asymptomatic: the rupture was only discovered during a routine manual uterine examination [2].

In our recent study of the clinical consequences of uterine rupture diagnosed during the early postpartum period, only 7/17 cases evaluated by manual uterine revision were correctly diagnosed with rupture, while in 10 the lesion was missed [3] (Table 1).

Missed diagnosis in these cases could stem from the size or location of the ruptures. Among these ten women, the indications for exploratory laparotomy were postpartum hemorrhage in six (60%), abdominal pain in 3 (30%) and hemodynamic shock in 1 (10%).

Many other studies examined the role of routine manual revision of the uterine scar after VBAC and revealed very low detection rates of uterine scar dehiscence or rupture. It was therefore suggested that revision of the uterine scar should be carried out only in symptomatic patients [5,6]. Furthermore, current guidelines, such as those published by the French College of Gynecologists and Obstetricians, state that the simple existence of a uterine scar is not an indication for a routine manual uterine examination after VBAC, and that the sensitivity of manual uterine examination to diagnose uterine rupture or dehiscence is low [4].

Our findings suggest that also among symptomatic women a negative finding during uterine exploration does not exclude uterine rupture.

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References

[1] Gibbins KJ, Weber T, Holmgren CM, Porter TF, Varner MW, Manuck TA. Maternal and fetal morbidity associated with uterine rupture of the unscarred uterus. Am J Obstet Gynecol 2015;213:382, doi:http://dx.doi.org/10.1016/j.ajog.2015.05.048 e1-6Gibbins KJ, Weber T, Holmgren CM, Porter TF, Varner MW, Manuck TA. Maternal and fetal morbidity associated with uterine rupture of the unscarred uterus. Am J Obstet Gynecol 2015;213:382.e1-6. doi:10.1016/j.ajog.2015.05.048..

[2] Guiliano M, Closset E, Therby D, LeGoueff F, Deruelle P, Subtil D. Signs, symptoms and complications of complete and partial uterine ruptures during pregnancy and delivery. Eur J Obstet Gynecol Reprod Biol 2014;179:130–4, doi:http://dx.doi.org/10.1016/j.ejogrb.2014.05.004Guiliano M, Closset E, Therby D, LeGoueff F, Deruelle P, Subtil D. Signs, symptoms and complications of complete and partial uterine ruptures during pregnancy and delivery. Eur J Obstet Gynecol Reprod Biol 2014;179:130–4. doi:10.1016/j.ejogrb.2014.05.004..

[3] Rottenstreich M, Rotem R, Hirsch A, Farkash R, Samueloff A, Sela HY. Delayed diagnosis of intrapartum uterine rupture – maternal and neonatal consequences. J Matern Fetal Neonatal Med 2019;0:1–6, doi:http://dx.doi.org/10.1080/14767058.2019.1613366Rottenstreich M, Rotem R, Hirsch A, Farkash R, Samueloff A, Sela HY. Delayed diagnosis of intrapartum uterine rupture – maternal and neonatal consequences. J Matern Neonatal Med 2019;0:1–6. doi:10.1080/14767058.2019.1613366..

[4] Sentilhes L, Vayssiere C, Beucher G, Deneux-Tharaux C, Deruelle P, Diemunsch P, et al. Delivery for women with a previous cesarean: guidelines for clinical practice from the French College of Gynecologists and Obstetricians (CNGOF). Eur J Obstet Gynecol Reprod Biol 2013;170:25–32, doi:http://dx.doi.org/10.1016/j.ejogrb.2013.05.015Sentilhes L, Vayssiere C, Beucher G, Deneux-Tharaux C, Deruelle P, Diemunsch P, et al. Delivery for women with a previous cesarean: guidelines for clinical practice from the French College of Gynecologists and Obstetricians (CNGOF). Eur J Obstet Gynecol Reprod Biol 2013;170:25–32. doi:10.1016/j.ejogrb.2013.05.015..

[5] Silberstein T, Wiznitzer A, Katz M, Friger M, Mazor M. Routine revision of uterine scar after cesarean section: has it ever been necessary? Eur J Obstet Gynecol Reprod Biol 1998;78:29–32Silberstein T, Wiznitzer A, Katz M, Friger M, Mazor

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