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.

Papageorgiou General Hospital of Thessaloniki, Aristotle University of Thessaloniki, Thessaloniki, Greece

Apostolos Mamopoulos
Third Department of Obstetrics and Gynecology, Hippokration General Hospital of Thessaloniki, Aristotle University of Thessaloniki, Thessaloniki, GreeceThird Department of Obstetrics and Gynecology, Hippokration General Hospital of Thessaloniki, Aristotle University of Thessaloniki, Thessaloniki, Greece

* Corresponding author at: Sevasteias 23-25, 62100, Serres, Greece.
E-mail address: christos.anthoulakis@hotmail.com (C. Anthoulakis).

Received 1 June 2019

http://dx.doi.org/10.1016/j.ejogrb.2019.06.027

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.

Funding

None of the authors have any direct or indirect financial incentive associated with publishing the article.

Acknowledgements

None.

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

★ The study was approved by the Human Investigation Review Board of Shaare Zedek Medical Center (IRB approval number: 0018-19-SZMC).

M. Routine revision of uterine scar after cesarean section: has it ever been necessary? Eur J Obstet Gynecol Reprod Biol 1998;78:29–32..
[6] Kaplan B, Royburt M, Peled Y, Hirsch M, Hod M, Ovadia Y, et al. Routine revision of uterine scar after prior cesarean section. Acta Obstet Gynecol Scand 1994;73:473–5Kaplan B, Royburt M, Peled Y, Hirsch M, Hod M, Ovadia Y, et al. Routine revision of uterine scar after prior cesarean section. Acta Obstet Gynecol Scand 1994;73:473–5..

Misgav Rottenstreich*
Reut Rotem
Hen Y. Sela
Department of Obstetrics and Gynecology, Shaare Zedek Medical Center, Jerusalem, Israel[1]Department of Obstetrics and Gynecology, Shaare Zedek Medical Center, Jerusalem, Israel, affiliated with the Hebrew University Medical School of Jerusalem.
[1]Affiliated with the Hebrew University Medical School of Jerusalem.

* Corresponding author at: Department of Obstetrics and Gynecology, Shaare Zedek Medical Center, 12 Bayit Street, Jerusalem, 91031, Israel.
E-mail address: misgavr@gmail.com (M. Rottenstreich).

Received 13 June 2019

http://dx.doi.org/10.1016/j.ejogrb.2019.06.029

Radiofrequency ablation of retained placenta accreta after conservative management

Dear Editor,

We herein report, to our knowledge, the first case of attempt to treat placenta accreta leaved *in situ* in human after delivery using radiofrequency (RF) ablation. The patient was a 35-year-old (gravida two para one) with history of cesarean delivery. Ultrasonography at 32 weeks of gestation showed an anterior placenta not low-lying. Labor was induced at 39 weeks and a female neonate weighing 3 400 g was delivered by vacuum extraction. Placenta delivery was incomplete and attempts for manual removal and uterine revision failed leading to suspicion of partial placenta accreta. So, decision was made to leave remaining placenta *in situ*. Immediate postpartum hemorrhage was diagnosed and treated with sulprostone. Estimated blood loss was 2 L and patient required transfusion of 2 units of red blood cells concentrate (RBCC). Embolization of the uterine arteries was performed in the immediate postoperative period and the patient was admitted to the intensive care unit for two days. The day after delivery, patient was hemodynamically stable (Hb 8.6 g/dl, platelets 180 G/l), and received 2 units of RBCC. Two days after delivery and embolization, patient was hemodynamically stable (Hb 7.6 g/dl, platelets 153 G/l) and received 2 units of RBCC. Ultrasonography showed persistent vascularity of the placenta. Three days after delivery, the patient presented normal bleeding and blood tests were normal (Hb 8.7 g/dl, platelets 156 G/l). Seven days after delivery, a new episode of obstetrical hemorrhage occurred (600cc). Ultrasonography showed persistent hypervascularized areas in the conserved placenta. After obtaining the patient's agreement, decision was taken for ablation of the retained placenta by RF in order to accelerate resolution by decreasing vascularization and tissue burden. Under epidural anesthesia, 7 hyper-vascularized areas of placenta were targeted by RF at 60–100 watts (RF3000™ Radiofrequency Ablation System, Boston Scientific), through percutaneous punction (LeVeen™ CoAccess™, 4.0 cm × 15 cm needle) under ultrasound monitoring (Figure 1).

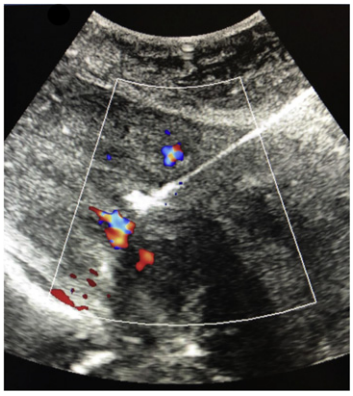

Fig. 1. RF ablation zone of a placental vascular bundle (Doppler Imaging) under ultrasonography with hyperechoic image of the needle electrode and gas bubble formation at its tip.

Thirteen days after, the patient had a recurrent hemorrhage episode and underwent embolization of uterine arteries and subtotal interannexial hysterectomy. Overall, 17 units of RBCC and 2 units of fresh-frozen plasma (FFP) were given pre- and intraoperatively. There were no postoperative complications and the patient was discharged home on postoperative day 8 (27 days postpartum) (Fig. 1).

Placenta accreta diagnosis can be made prenatally or when manual removal of the placenta after delivery, has failed. Conservative management of placenta accreta is a therapeutic approach which, when possible, may reduce morbidity of peripartum hysterectomy but implies close and long-term surveillance because of potential delayed complications [1]. Current management of secondary complications consists of different approaches including methotrexate injection or selective embolization procedures, but with no satisfactory results [2,3]. To date, no surgical procedure is available in order to reduce this delay allowing prevention of potential secondary complications. Ablation of the retained placenta by RF, a minimally invasive, image-guided technique [4], could be proposed as an alternative procedure, as the placenta is very permissive to RF [5]. Previously explored *in vivo* (animal models) and *in vitro,* RF application on the placenta at low power and low temperature appears to be safe, with good tolerance in terms of biological inflammation or secondary sepsis [5]. To date, there is not enough evidence to evaluate efficacy and potential risks related to RF. In the present case, RF ablation was not efficient but no complication was observed. Indeed, a recurrent hemorrhage episode required a second procedure of uterine arteries embolization followed by subtotal interannexial hysterectomy.

This unique case is, evidently, not enough to conclude in efficiency or potential complications associated with RF ablation of placenta accreta leaved *in situ*. But it seems important to us to report this therapeutic alternative option, as it could be considered for women who wish to preserve their fertility.

Acknowledgment

No funding was received.

References

[1] Sentilhes L, Goffinet F, Kayem G. Management of placenta accreta. Acta Obstet Gynecol Scand 2013;92(October (10)):1125–34Sentilhes L, Goffinet F, Kayem G.