

CASE REPORT

Diagnosis of a defect in the uterine wall using 3D ultrasound in the 16th week of gestation

Carlos López Ramón y Cajal & Vanesa Rodríguez Fernández 

Service of Obstetrics and Gynecology, Álvaro Cunqueiro Hospital, Vigo, Spain

Correspondence

Carlos López Ramón y Cajal, Service of Obstetrics and Gynecology, Álvaro Cunqueiro Hospital, Estrada Clara Campoamor nº 341 - 36312 Vigo, Pontevedra, Spain.
Tel: 34 986 825 130 - 34 986 825 137;
E-mail: carlos.lopez.ramon.y.cajal@sergas.es

Funding Information

No sources of funding were declared for this study.

Received: 28 July 2016; Revised: 26 March 2017; Accepted: 14 April 2017

Clinical Case Reports 2017; 5(8): 1230–1233

doi: 10.1002/ccr3.1043

What's known/New statements:

The diagnosis of a dehiscence of the uterine wall by volumetric study and surface rendering mode allows us to perform an ample detailed study of this area and to design a clinical strategy regarding pregnancies.

Case Report

A 39-year-old woman had a laparotomic myomectomy, and she had a uterine rupture in the pregnancy following myomectomy 2 years later. An ultrasound performed in the 30th week of her first gestation, because of the perception of irregular painful uterine contractions, revealed the uterine defect. It measured $7 \times 6 \times 8$ cm and was located in the anterior part of the fundus, in the area of the myomectomy, with a herniated amniotic sac extending into the maternal abdominal cavity. The rupture was confirmed and sutured in the cesarean section, and a 1640-g male infant was delivered without complications; the neonate was discharged 30 days after with a satisfactory state. During the next pregnancy, 4 years later, we performed a detailed scan of the uterine wall in the 11th

Key Clinical Message

The 3D volumetric transabdominal study with rendering mode is a very useful tool to perform a detailed study of the uterine wall, and it allows us to create a safe and early strategy during pregnancy in uterine dehiscences, as we show in this case in the 16th week of gestation.

Keywords

3D uterine scar scan, uterine dehiscence, uterine scan, uterine scar.

and 16th weeks of gestation. At first, we did not observe any problems, but in the 16th week, we detected a very thin area of the uterine wall located in the anterior side of the fundus, just on the edge of the placenta. This zone coincided with the area of the anterior rupture. The thinnest uterine segment defect section was about 0.087 cm (0.17 cm average of different places of the area studied) (Fig. 1) with 2.04 cm length \times 2.28 cm width. We used EPIQ 7 ultrasound machine (Philips Medical Systems, Bothell, WA) equipped with C5-1, C9-2, and a 6–1-MHz matrix-array probes. A 3D volumetric study using high-resolution rendering (HDreal) confirmed a section with a dehiscence of the uterine wall. The uterine wall defect was only protected by the peritoneum, as it is shown from the uterine cavity (Fig. 2) and from an abdominal projection (Fig. 2). Sometimes, in relation to the uterine tone, this

area protruded into the abdominal cavity manifesting an extreme weakness of the area. A hysterectomy was performed during pregnancy in the 18th week of pregnancy without complications. Pathologic study of the uterine wall confirmed this diagnosis.

Discussion

Uterine scar dehiscence involves the disruption and separation of a preexisting uterine scar. It does not lead to any serious maternal or neonatal consequences, and it is often incidentally discovered at the time of cesarean delivery. However, uterine rupture refers to the complete disruption of all uterine layers, including the serosa, leading to changes in maternal or fetal status. It is a life-threatening pregnancy complication for both mother and fetus [1].

Most ruptured uteri have been associated to a scarred uterus (77%) and usually were found at term gestation

(83%) [2]. But among women with a scarred uterus, 79% could be of an unknown uterine scar type [2].

Data on future pregnancies after repair of a ruptured scarred uterus are derived from small case series. Reports about the risk of recurrent rupture vary widely [3] but longitudinal ruptures and short intervals between rupture and subsequent pregnancy predispose toward the recurrence of uterine rupture [4].

Repairs of the uterine defect with successful outcome have also been described [5]. However, no conclusions can be made about the efficacy of these approaches, given the complexity and rarity of such cases. We would not manage these cases conservatively because of the potential for maternal mortality or significant morbidity.

The risk of uterine rupture in the presence of a defective scar is related to its location and the degree of thinning of the lower uterine segment as measured by ultrasound. The risk of uterine rupture in a corporal scar

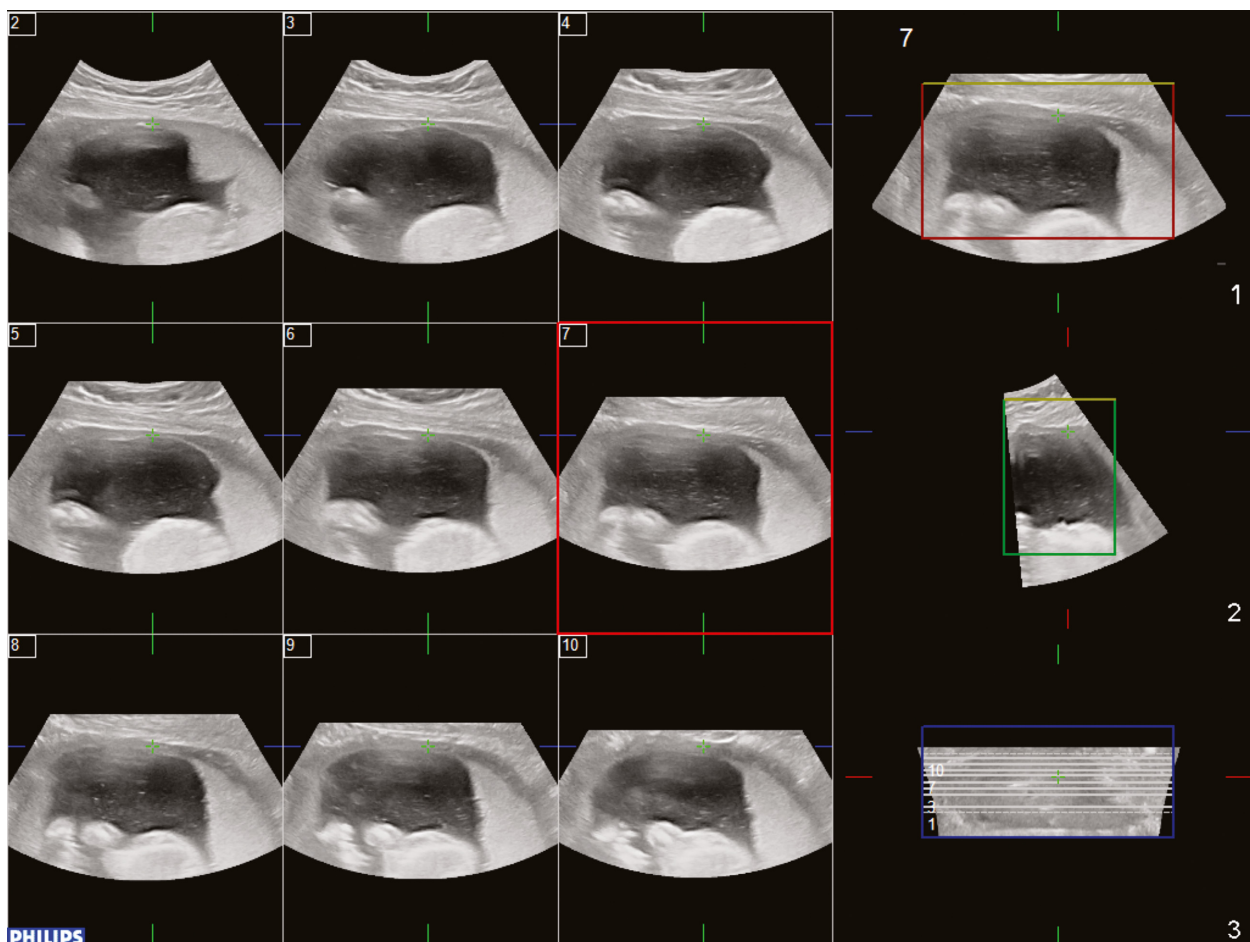


Figure 1. Axial sections in iSlice study on uterine dehiscence, which is located on the anterior face of the uterine fundus. The thinnest segment of the uterine wall was 0.087 cm (0.17 cm average), 2.04 cm length × 2.28 cm width.

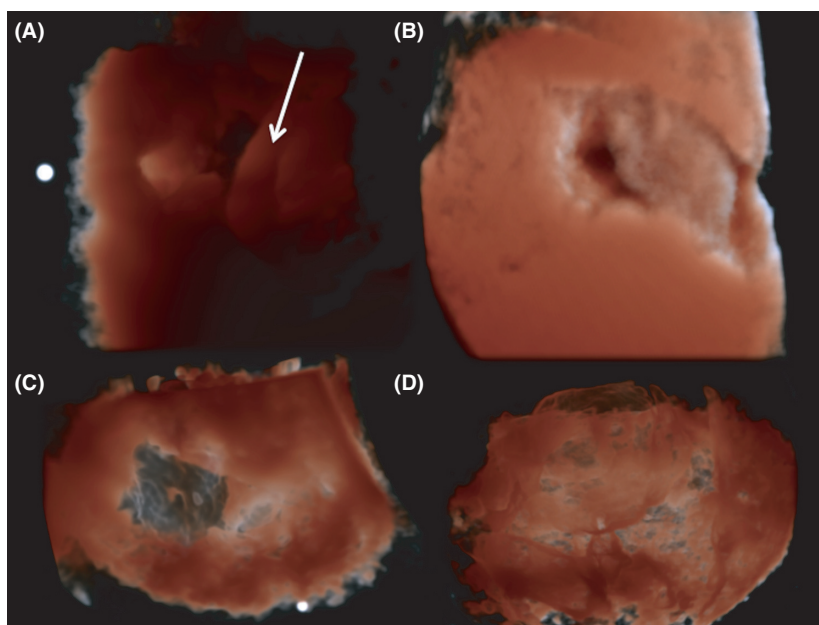


Figure 2. (A) Uterine dehiscence from inside the uterine cavity. The thinnest area was translucent, and it was covered only by the peritoneum. This anatomical weakness was more patent using a posterior light in the 3D rendering. The rendering light passes through uterine wall defect illuminating inside the cavity, which even allows us to illuminate the cavity and to recognize the fetus (arrow). (B) Using the rendering light in the cavity, we can detect the uterine defect near the placenta more clearly. (C) Uterine dehiscence from an external uterine surface. Anatomical weakness was more obvious using an anatomical live 3D rendering. The dehiscence area could be clearly seen. (D) The area around this dehiscence area shows very evident weakness.

is greater than a low segment scar, and it also usually breaks before the onset of labor [6].

The decision to perform hysterectomy is based on a combination of factors, including the patient's desire for future pregnancy, the extent of uterine damage, the patient's intraoperative hemodynamic and anesthetic stability and the skill of the surgeon for repairing a complicated rupture.

There are cases described in the literature that have shown good outcomes with an expectant management in an asymptomatic patient with an uterine dehiscence [7]. We offered her different management strategies, and we also informed about her own risk associated with the thinness of the defective scar in the anterior part of the fundus and her history of spontaneous uterine rupture at the same site during first pregnancy. Our patient, instead of being asymptomatic, decided that she would not assume any associated complications and she did not wish for more pregnancies in the future, so she asked for hysterectomy.

It could be necessary to perform a detailed ultrasound exploration of the uterine wall after any obstetric or gynecological process such as a cesarean section, myomectomy, complicated curettages or previous uterine rupture. This evaluation is possible using 2D scans [8] or 3D

volumetric studies [9]. These cases should be reevaluated before and during antenatal scans in following pregnancies. An early scan during the pregnancy on a uterine scar will allow us to evaluate the relation between the trophoblast and the uterine scar that would allow us to design a clinical strategy in that pregnancy.

Three-dimension ultrasound is useful in the evaluation of a cesarean scar defect, as it can demonstrate the location, shape, and size of the defective scar more precisely. This might be due to the use of a multiplanar display (which permits simultaneous longitudinal, transverse, and coronal views) and their surface reconstruction, which cannot be obtained through 2D ultrasound [10].

Authorship

CLRC: Acquisition of data, conception and design of the article, review of the literature, revising and approval of the manuscript. VRF: Review of the literature, drafting the manuscript, edition of the final manuscript.

Conflict of Interest

None declared.

References

1. Gibbins, K. J., T. Weber, C. M. Holmgren, T. F. Porter, M. W. Varner and T. A. Manuck. 2015. Maternal and fetal morbidity associated with uterine rupture of the unscarred uterus. *Am. J. Obstet. Gynecol.* 213:382.e1-6.
2. Veena, P., S. Habeebullah, and L. Chaturvedula. 2012. A review of 93 cases of ruptured uterus over a period of 2 years in a tertiary care hospital in South India. *J. Obstet. Gynaecol.* 32:260–263.
3. Chibber, R., E. El-Saleh, R. Al Fadhli, W. Al Jassar, and J. Al Harmi. 2010. Uterine rupture and subsequent pregnancy outcome—how safe is it? A 25-year study. *J. Matern. Fetal Neonatal Med.* 23:421–424.
4. Usta, I. M., M. A. Hamdi, A. A. Musa, and A. H. Nassar. 2007. Pregnancy outcome in patients with previous uterine rupture. *Acta Obstet. Gynecol. Scand.* 86:172–176.
5. Matsunaga, J. S., C. B. Daly, C. J. Bochner, and C. L. Agnew. 2004. Repair of uterine dehiscence with continuation of pregnancy. *Obstet. Gynecol.* 104:1211–1212.
6. Rozenberg, P., F. Goffinet, H. J. Philippe, and I. Nisand. 1996. Ultrasonographic measurement of lower uterine segment to assess risk of defects of scarred uterus. *Lancet* 347:281–284.
7. Rabinowitz, R., A. Samueloff, E. Sapirstein, and O. Shen. 2006. Expectant management of fetal arm extruding through a large uterine dehiscence following sonographic diagnosis at 27 weeks of gestation. *Ultrasound Obstet. Gynecol.* 28:235–237.
8. Baranov, A., G. Gunnarsson, K. Å. Salvesen, P. E. Isberg, and O. Vikhareva. 2016. Assessment of Cesarean hysterotomy scar in non-pregnant women: reliability of transvaginal sonography with and without contrast enhancement. *Ultrasound Obstet. Gynecol.* 47:499–505.
9. Glavind, J., L. D. Madsen, N. Ulbjerg, and M. Dueholm. 2016. Cesarean section scar measurements in non-pregnant women using three-dimensional ultrasound: a repeatability study. *Eur. J. Obstet. Gynecol. Reprod. Biol.* 201:65–69.
10. Mansour, G. M., S. F. El-Mekkawi, H. T. Khairy, and A. E. Mossad. 2015. Feasibility of prediction of cesarean section scar dehiscence in the third trimester by three-dimensional ultrasound. *J. Matern. Fetal Neonatal Med.* 28:944–948.