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Title	Successful pregnancy in a woman with uterine scarring by transverse fundal cesarean section
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Citation	Journal of Obstetrics and Gynaecology Research, 40(5), 1420-1422 https://doi.org/10.1111/jog.12361
Issue Date	2014-05
Doc URL	https://hdl.handle.net/2115/59108
Rights	The definitive version is available at Wiley Online Library , www.wileyonlinelibrary.com.
Type	journal article
File Information	J Obstet Gynaecol Res_40(5)_1420-1422.pdf

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Revised [Case Report] for ***J Obstet Gynaecol Res***

Successful pregnancy in a woman with uterine scarring by transverse fundal cesarean section

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Running foot: Successful pregnancy after FTC

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ABSTRACT

Background: There has been only one report to date of successful pregnancy outcome after fundal transverse cesarean section (FTC). Here, we report a pregnancy established in a woman with a history of previous FTC.

Case: FTC was performed at gestational week (GW) 24 in this patient's first pregnancy complicated with premature membrane rupture and placenta previa in which the placenta widely covered the entire anterior uterine wall. The patient's uterus was preserved. Magnetic resonance imaging (MRI) studies performed four times in her second pregnancy consistently showed part of the uterine fundus in which the muscle layer was interrupted. Although bulging of fetal membranes outside the uterus was not seen, concern regarding spontaneous uterine rupture in the absence of labor pains prompted us to interrupt her pregnancy at GW $31^{-5/7}$, delivering a premature, but otherwise healthy female infant, weighing 1832 g. The infant required transient intratracheal intubation for respiratory distress syndrome (for less than 1 h), but had an otherwise uneventful clinical course, and left the hospital at postnatal day 68 with normal findings on brain ultrasound study.

Conclusions: Two cases, including ours, suggest that successful pregnancy outcome is feasible at least in some women with **uterine** scarring due to FTC.

Key words: cesarean hysterectomy; placenta previa; placenta accreta; postpartum hemorrhage

INTRODUCTION

New procedures were developed by Kotsuji and colleagues in 2004 [1] and proved effective in the reduction of blood loss during cesarean section in women with placenta previa widely covering the entire anterior uterine wall in which placenta accreta cannot be excluded [2,3]. As this procedure, fundal transverse cesarean (FTC), consists of a transverse fundal incision in the uterine wall to avoid transecting the placenta, there is concern about the risk of uterine rupture in women with preserved uterus [2 – 4]. However, to our knowledge, there has been only one previous report of a successful pregnancy outcome after FTC **[2].**

We performed FTC in a total of 14 cases with the placenta widely covering the entire anterior uterine wall with or without suspected placenta accreta over the 7-year period between September 2006 and August 2013. Details of 12 women who underwent FTC by March 2011 at Hokkaido University Hospital were reported previously [3]. The uterus was preserved in 4 of the 14 women with FTC, and one eventually became pregnant after FTC. Here, we report the successful outcome of this pregnancy with the patient's permission.

CASE REPORT

The patient's first pregnancy at the age of 30 years was complicated with placenta

previa and premature membrane rupture occurring at gestational week (GW) 21. Ultrasound study revealed that the placenta widely covered the entire anterior uterine wall. The couple strongly wished to continue the pregnancy. However, increased vaginal bleeding necessitated blood transfusion and emergency FTC at GW 24. Her uterus was preserved. A female infant with a birth weight of 406 g died from chronic lung disease at postnatal day 93.

Magnetic resonance imaging (MRI) study performed at 12 months postpartum revealed that there was a part of the uterine fundus in which the muscle layer was very thin or lacking in this patient (Fig. 1, A and B). Her second pregnancy was established at 18 months after FTC. Due to concerns regarding spontaneous uterine rupture in the absence of labor pains in this pregnancy, she was hospitalized from GW 18 until delivery and underwent ultrasound study twice weekly for early detection of the possible fetal membranes bulging outside the uterus. The patient underwent a total of five MRI studies, including those performed during her second pregnancy at GW 15, 20, 26, and 30. MRI studies consistently indicated a part of the uterine fundus in which the muscle layer was interrupted, but no bulging of the fetal membranes outside the uterus was observed. **Betamethasone (12 mg) was administered twice in this patient at GW 30 for the purpose of fetal lung maturation.** After an extensive discussion with the parents, we performed a low segmental transverse (conventional) cesarean section at GW $31^{-5/7}$, delivering a premature, but otherwise healthy female infant **with Apgar scores of 8 and 9 at 1- and 5-min, respectively and the umbilical arterial blood pH of 7.277**, weighing 1832 g. Two portions (look like a well with diameter of 5 to 7 mm) of the uterine fundus in which there was no or only a very thin muscle layer were

removed surgically and repaired with careful muscle-muscle sutures. The infant required transient intratracheal intubation for respiratory distress syndrome (for less than 1 h), but had an otherwise uneventful clinical course, and left the hospital at postnatal day 68 with normal findings on brain ultrasound study.

DISCUSSION

To our knowledge, there has been only one previous report of successful pregnancy outcome after FTC to date [2]. The outcome of the first case after FTC was described in a report by Kotsuji et al. [2] as follows: “One woman in our series went on to successfully deliver a mature infant after an uneventful 34-week prenatal course.” Thus, pregnancy after FTC was successful in the first case as well as the second case described here, although the details of the prenatal course in the first case are unknown.

During the conventional procedure for women with placenta previa accreta, it is often necessary to decide within several minutes whether hysterectomy should be performed because of sustained and active bleeding from the placental site. Even procedures for childbirth are often accompanied by active bleeding from the injured placenta. In our experience in treating women using FTC, this procedure markedly decreased the difficulty of cesarean section because we were able to perform childbirth in a bloodless field and have sufficient time to consider postponement of hysterectomy after uterine artery embolization even in cases in which hysterectomy is considered necessary.

However, all authors who reported efficacy of FTC expressed concern about the risk of uterine rupture in subsequent pregnancies [2 – 4], because FTC was only recently proposed as an alternative to conventional low segmental transverse cesarean section in 2004 [1]. **Therefore, we assessed wound healing at the site of FTC carefully before the establishment of current pregnancy in this patient with both MRI and ultrasonography. As the myometrial defect was present in the upper pole of the uterus (Fig 1), ultrasonography was ineffective in detecting the defect. The ultrasonography may be useful for early detection of the possible fetal membranes bulging outside the uterus, although such an event did not occur in this patient.**

As arteries and arterioles in the myometrium run transversely, but not vertically, transverse incision in the myometrium theoretically causes less injury to these transversely running vessels compared with vertical incision in the myometrium [5]. This may help to reduce the risk of uterine rupture during subsequent pregnancy. However, the risk of uterine rupture is approximately 0.5% even in women who undergo trial of labor after cesarean with a low segmental transverse (conventional) incision [6]. A larger number of pregnancy outcomes (> 100 cases) should be analyzed to determine the risk of uterine rupture in subsequent pregnancies. Therefore, we reported the present successful case in which very intensive care was given. Nishijima et al. proposed the following to avoid catastrophic outcome caused by possible uterine rupture [4]: women are advised to use contraception for 1 year, they should receive intensive care from 25 weeks of gestation in the next pregnancy, and cesarean delivery should be performed at GW 34 – 35. An elective cesarean section was

performed at GW $31^{-5/7}$ in the present case because of excessive concern regarding the possibility of uterine rupture. This was due to the lack of evidence concerning the risk of uterine rupture in women with uterine scarring by FTC, which also prompted us to document this successful case.

In conclusion, the present case, as well as the first such report in the literature [2], suggested that successful pregnancy outcome is feasible at least in some women with uterine scarring by FTC.

DISCLOSURE

We declare that we have no conflicts of interest in connection with this paper.

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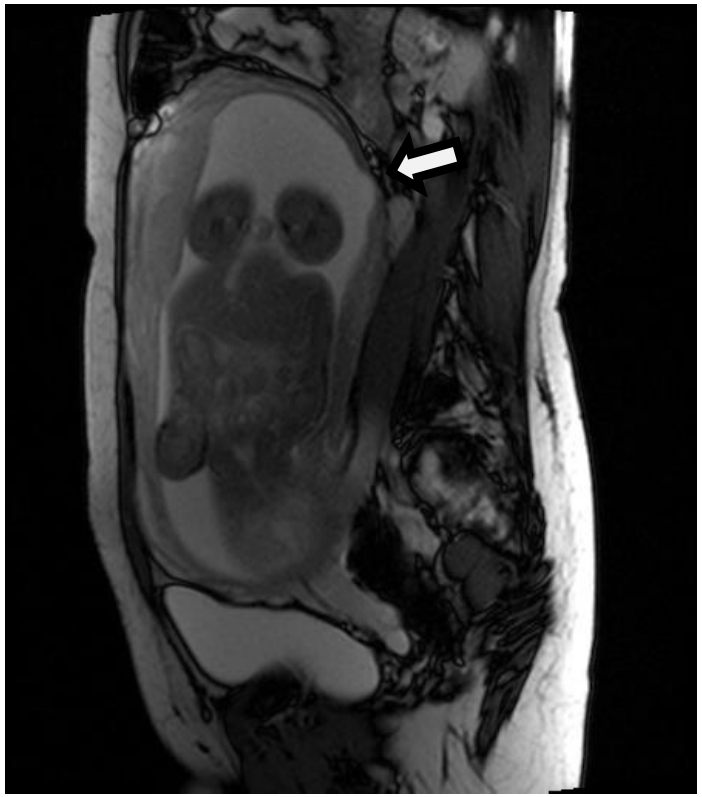
Figure Legends

Figure 1: MRI findings in this patient

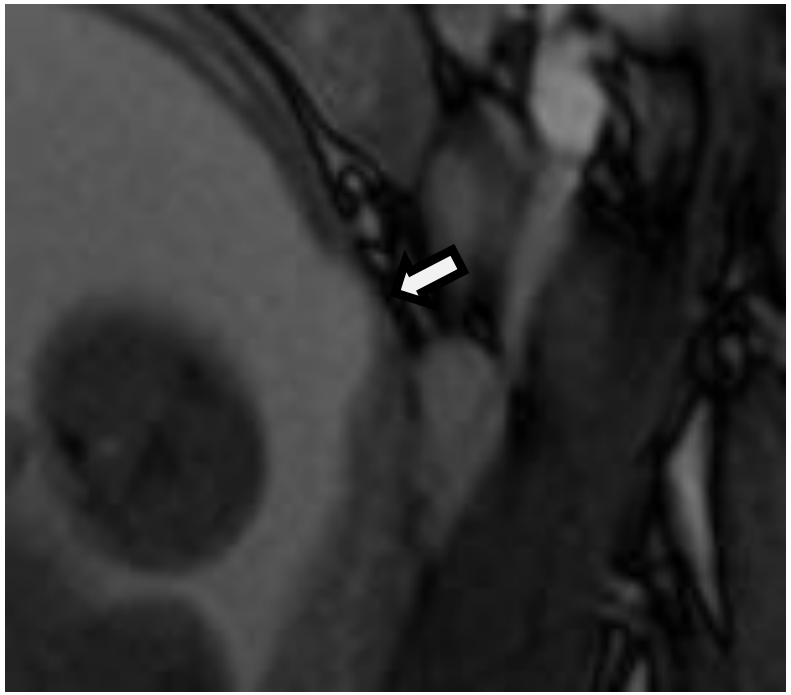
White arrows indicate part of the uterine fundus in which interruption of the muscle layer or a very thin layer of muscle was seen. A, Sagittal view at 12 months postpartum; B, Enlarged A; C, Sagittal view at gestational week 26; D, Enlarged C.

A

B



C



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