

# Placenta Accreta and Total Placenta Previa in the 19th Week of Pregnancy

## Placenta accreta und Placenta praevia totalis in der 19. Schwangerschaftswoche

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### Key words

- placenta previa
- placenta accreta
- pregnancy

### Schlüsselwörter

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### Abstract

Placentation disorders are the result of impaired embedding of the placenta in the endometrium. The prevalence of these disorders is estimated to be around 0.3%. A history of previous prior uterine surgery (especially cesarean section and curettage) is the most common risk factor. Impaired placentation is differentiated into deep placental attachment; marginal, partial and total placenta previa; and placenta accreta, increta and percreta. Treatment depends on the severity of presentation and ranges from expectant management to emergency hysterectomy. In most cases, preterm termination of pregnancy is necessary. We report here on the case of a 39-year-old woman with placenta accreta and total placenta previa who underwent hysterectomy in the 19th week of pregnancy.

### Zusammenfassung

Placentationsstörungen entstehen durch eine fehlerhafte Einnistung der Plazenta im Bereich des Endometriums. Ihre Prävalenz wird mit ca. 0,3% angegeben. Als Risikofaktoren gelten vorangegangene operative Eingriffe am Uterus (v.a. Sectio und Kürettage). Man unterscheidet bei Störungen der Plazentation den tiefen Plazentasitz von der Placenta praevia marginalis, partialis sowie totalis und der Placenta accreta, increta sowie percreta. Das therapeutische Spektrum reicht je nach Ausprägungsgrad vom exspektativen Vorgehen bis hin zur notfallmäßigen Hysterektomie. In den meisten Fällen wird eine vorzeitige Schwangerschaftsbeendigung erforderlich. Wir berichten über eine 39-jährige Frau mit Placenta accreta und Placenta praevia totalis, bei der eine Hysterektomie in der 19. Schwangerschaftswoche (SSW) durchgeführt wurde.

### Introduction

Placentation disorders are disorders which occur during attachment of the placenta to the uterine wall; their incidence depends on the week of gestation. The incidence of placentation disorders in the 20th week of gestation (GW) is estimated to be around 5 in 100 pregnancies. At delivery, the incidence is only around 0.3%, as uterine growth in pregnancy often leads to migration of the placenta away from the internal os [1,2]. There are different forms of placentation disorders and they occur with varying degrees of severity, depending on the underlying pathophysiological process. Placentation is a complex process, mediated by prostaglandins, sexual hormones, cytokines and immunological factors [3]. It occurs in the early days after fertilization of the ovum. The fertilized ovum or zygote reaches the uterine cavity around 4 days after fertilization. The zygote

divides repeatedly, developing into a blastocyst consisting of two layers. The outer layer of the blastocyst is made up of trophoblast cells which will form the placenta and the fetal membranes. The inner cell layer, the embryoblast, will later develop into the embryo. Physiologically, invasion of the endometrium by the trophoblast is limited to the decidua basalis. Placenta accreta is present when there is excessive invasion during placentation extending beyond the decidua basalis. If invasion by the placenta extends into the uterine myometrium, this is known as placenta increta. If the placental villi penetrate the myometrium and reach the uterine serosa or even invade neighboring organs such as the bladder, this is known as placenta percreta [4]. Rosen has suggested that placentation is regulated by the degree of oxygen saturation of the tissue, with local hypoxia promoting invasion by placental villi. This would explain why scar tissue resulting from previous

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**Fig. 1** Doppler sonography image showing vessels pointing in the direction of the bladder wall. White arrow: bladder, red arrow: placenta, star: fetal head.

uterine surgical procedures contributes to placentation disorders [5].

In addition to faulty invasion by placental villi, placental disorders include low-lying placenta (placental edge closest to the cervix < 2 cm from the inner os), marginal placenta previa (placenta extends to the edge of the cervix), partial placenta previa (a portion of the cervix is covered by the placenta), and total placenta previa (inner os completely covered by the placenta) [4].

### Case Report

We report here on a 39-year-old woman, gravida 8, para 4, who was transferred to our department from another hospital on November 12, 2014 in the 18 + 3 week of pregnancy because of suspicion of placenta percreta and total placenta previa. The woman had been admitted to the other hospital 3 days earlier for antepartum bleeding and lower abdominal pain. A diagnosis of total placenta previa was made following examination on admission. Doppler sonography raised the suspicion of placenta percreta with involvement of the bladder. The suspicion of placenta percreta was confirmed by an MRI of the pelvis. After 3 days' expectant management which included bed rest, oral magnesium substitution and rhesus prophylaxis (blood group 0, rhesus negative), the patient was transferred to our department.

### Medical History

On admission the patient complained of dragging lower abdominal pain and a feeling of abdominal pressure ("bloating abdomen"). She had not had any further bleeding since three days. She had been suffering from diffuse lower abdominal pain since several weeks. Outpatient examinations had not yielded any findings and parameters had always been within normal ranges. The patient had previously given birth to four children. The first delivery was by primary cesarean section for breech presentation

in 1997. In 2000 she gave birth to a girl by forceps-assisted vaginal delivery performed in the expulsion period for obstructed labor. Three years later she gave birth to a boy by secondary cesarean section, performed for nuchal cord. She last gave birth in 2006 by primary cesarean section (her third cesarean section) for breech presentation. The possibility of bilateral tubal ligation was discussed at the time, but the patient opted to take oral contraceptives. The patient had had 3 further surgical uterine procedures: 2 terminations in 2001 and 2005, respectively, and one abortion curettage in the 8th week of gestation in May 2014. The patient reported smoking between 8–10 cigarettes daily. The patient did not consume alcohol. She was allergic to nickel and perfume. When asked about her social history, the patient reported having worked as a shop assistant in a bakery but that she was currently not employed.

### Clinical Findings

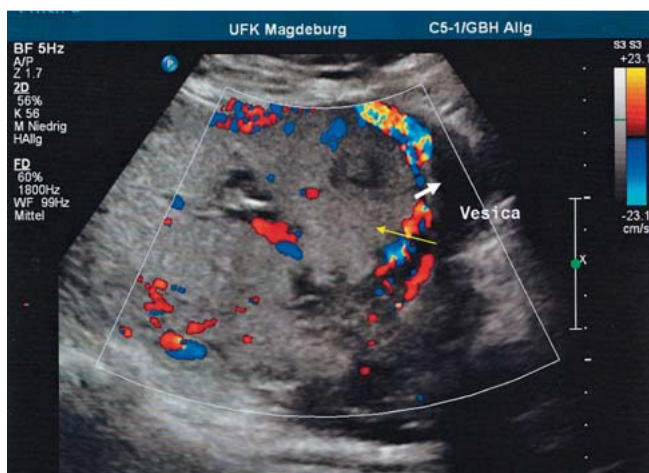
No vaginal bleeding was found on examination at admission. Vaginal pH was 4.0. A routine vaginal smear test was performed. The pathogen *Enterococcus faecalis* was found with no resistances. On palpation the cervix was sacral, medium soft and closed. Abdominal sonography showed an intact singleton pregnancy appropriately developed for age. Cervical length on vaginal sonography was 35 mm without funneling. The placenta covered the inner os. Doppler sonography was suspicious for placenta percreta with placental vessels invading the bladder (● Fig. 1).

### Course after Admission

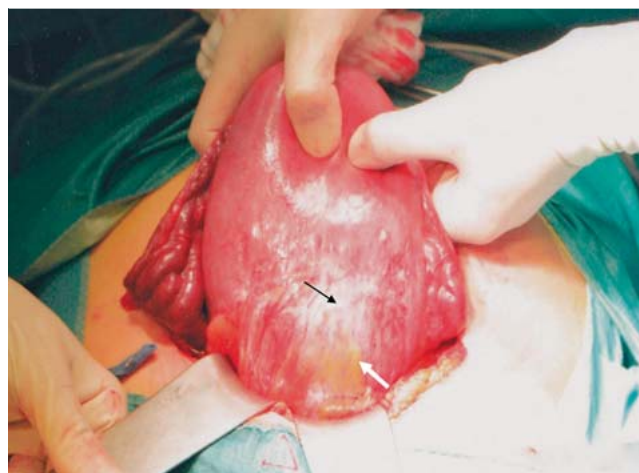
We admitted the 39-year-old, gravida 8, woman as an inpatient in our gynecological department and continued oral magnesium substitution (200 mg 3 × per day). Because of the suspicion of placenta percreta she additionally received prophylactic oral antibiotics with metronidazole (400 mg 3 × per day). On November 13, 2014 she underwent ultrasound for detailed diagnosis. After imaging clearly showed pronounced vasculature between the scarred uterine wall and the maternal bladder, a tentative diagnosis of placentation disorder in the 19th week of pregnancy following 3 cesarean sections, total placenta previa and placenta percreta was made (● Fig. 2). A residual myometrium thickness of 4 mm was measured at the anterior uterine wall.

After an extensive and detailed discussion of the diagnosis with the patient and careful weighing up of the pros and cons of continuing the pregnancy (giving birth to a fifth child on the one hand, maternal and fetal risk from infiltration of the bladder, uterine rupture or threatening miscarriage on the other) the decision was taken to perform planned abdominal hysterectomy without adnexectomy. During the consultation we also discussed expectant management as another potential option in this specific situation and explained the difficulties of obtaining a precise preoperative diagnosis of placentation disorders. The patient ultimately opted for hysterectomy to forestall potential serious injuries to organs and prevent strong hemorrhaging.

The surgical intervention was performed on November 14, 2014 in GW 18 + 5. Intraoperatively, the bladder was found to be stretched cranially across the uterus. The preoperative suspicion of placental invasion of the bladder was not confirmed. However, the lower uterine segment was massively overextended, extremely thin and very soft. The uterus measured around



**Fig. 2** Detailed ultrasound imaging done on November 13, 2014: placental villi appear to be invading the bladder, confirming a diagnosis of placenta percreta and demonstrable total placenta previa. White arrow: bladder, yellow arrow: placenta.



**Fig. 3** Surgical site with thin, extended, lower anterior uterine wall and partially visible placenta. Black arrow: concealed rupture of the anterior uterine wall; white arrow: bladder extended across the uterine wall.

10 × 12 cm. After the bladder had been dissected caudally, the extent of the defect in the uterine wall became clear. The entire lower anterior uterine wall consisted only of a thin translucent layer of peritoneum with the placenta clearly visible through it (► **Fig. 3**). These clinical findings led to a diagnosis of placenta accreta. Coverage of the defect would not have been possible as the defect was the size of the palms of two hands. The patient received 2 erythrocyte concentrations intraoperatively after losing 1000 ml of blood and presenting with an intraoperative Hb of 5.9 mmol/l (preoperative Hb was 8.1 mmol/l). A male fetus weighing 210 g without morphological anomalies was found in utero. The uterus and placenta weighed 400 g (► **Fig. 4**). It was sent for histological examination. Histopathological workup resulted in a diagnosis of placenta accreta, total placenta previa and concealed uterine rupture.

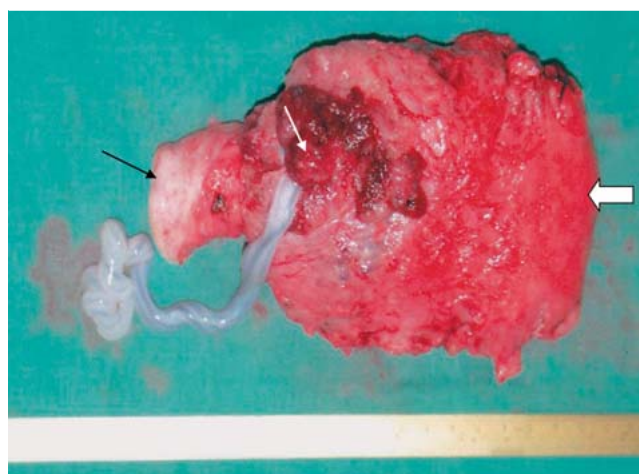
The patient's postoperative course was uneventful. After 24-hour monitoring in the recovery room, the patient was transferred to a regular ward on November 15, 2014. A detailed postoperative discussion was held with the patient who was also offered pastoral care at the bedside. The patient did not want a postmortem autopsy of the fetus. On November 21, 2014 (7th postoperative day) the 39-year-old patient was discharged home after findings at final examination were unremarkable.

## Discussion

This clinical case report describes a case of placentation disorder which took the form of placenta accreta and total placenta previa after 3 previous cesarean sections. The case additionally presented with concealed uterine rupture. This clinical case illustrates the potential complications which may appear after repeated cesarean sections. The status post cesarean section is one of the main risk factors for the development of placentation disorders in the next pregnancy. The largest study on this issue to date, published in 2006, was carried out by Silver et al. and investigated the association between cesarean section and later maternal complications in 30 132 women. The study found a risk of 0.24% for placenta accreta in the subsequent pregnancy after ce-

sarean section. The risk after 6 cesarean sections was 6.47% [6]. Endometrial scarring of other provenance, for example after curettage or endometritis, also increased the incidence of impaired placentation. Other risk factors for placentation disorders include maternal age > 35 years, multiparity, submucous fibroids, and deposition of the embryo close to the cervix during embryo transfer with assisted reproductive technology [7].

Ultrasound, potentially combined with Doppler sonography, is the gold standard for the diagnosis of placentation disorders. The placenta is located during the first ultrasound examination performed between GW 9–12. A low-lying placenta or a placenta covering all or part of the inner os are still fairly common at this point as the uterus has not grown much yet [1]. If a second ultrasound examination performed sometime in the 19th to the 22nd week of pregnancy again raises the suspicion of placentation disorder and it is not possible to confirm or disprove the suspicion, then – as was done with our patient – MRI is recommended [8].



**Fig. 4** Uterus with placenta after hysterectomy. Thin white arrow: placenta in the uterus; thick white arrow: uterine body; black arrow: uterine cervix.



The 2010 DGGG guideline recommends that pregnant women with impaired placentation after previous cesarean section contact their maternity hospital early on, preferably before the start of the 30th week of pregnancy, to plan the birth [9].

Management of placentation disorders depends, in the first instance, on the extent of the disorder as well as on the patient's wish to have a child. Co-morbidities and clinical presentation of the impaired placentation must also be considered. The standard management of pregnancy in women with placental invasion of the myometrium is cesarean hysterectomy [10]. Another therapy option for patients with placenta accreta, increta or percreta who wish to have further children consists of leaving the part of the placenta adhering to the uterine wall in situ after performing cesarean section. This option must then be followed by non-surgical treatment such as interventional radiology for uterine artery embolization and/or the administration of methotrexate. Treatment with the folic acid antagonist methotrexate was first proposed in 1986 by Arulkumaran. He reported on a patient who had received intravenous methotrexate for a period of 2 weeks after cesarean section for placenta accreta. At the end of this period there were no signs of the placenta on ultrasound examination, and the patient was discharged 15 days postpartum [11, 12]. Khan et al. described performing uterine artery embolization within 2 hours of cesarean section in a patient with placenta accreta in whom the placenta remained in utero, followed by the administration of methotrexate 50 mg by weekly intramuscular injection for 3 weeks with folic acid. Beta HCG in this patient after 5 months was less than 5 mIU/ml. However, in their review, the authors noted that this conservative therapy cannot yet be considered the standard treatment [13]. Potential risks of a conservative approach which leaves the placenta in utero include hemorrhage, clotting disorders and septicemia [14]. The consensus is that in cases with total placenta previa, delivery should be by primary cesarean section after the pregnancy has been prolonged under close monitoring. In cases with partial placenta previa the choice of delivery can be an individual decision between vaginal delivery and cesarean section; however, vaginal delivery should be the delivery method of choice for women with marginal placenta previa [15].

If placenta accreta, increta or percreta is only recognized in labor, the lack of uterine tone can result in life-threatening hemorrhage. Welsch et al. collected data on cases of fatal postpartum hemorrhage due to placentation disorders in women who were status post cesarean section from the Bavarian Perinatal Survey. There were 11 deaths between 1983 and 2007 in Bavaria, but there have been no cases of fatal uterine rupture since 1987 [16]. Because ultrasound imaging in our patient was suspicious for placenta percreta with invasion of the bladder and the patient considered prolonging the pregnancy to be of secondary importance in view of the potential health risks to herself, we agreed with her that we would terminate the pregnancy by performing a hysterectomy. The aim was to prevent maternal risks such as hemorrhage, clotting disorder or infection with its threat of subsequent sepsis. The intraoperative findings proved to be less complex, and a diagnosis of placenta accreta was made. This clearly illustrates the limitations of ultrasound in the prenatal diagnosis of impaired placentation. The case report demonstrates that it is not possible to make a definitive diagnosis of placentation disorder with the available prenatal diagnostic methods, meaning that it is important to be cautious when deciding on further measures. In a recently published retrospective cohort study, Hall et al. reported that cases of placenta accreta not

diagnosed prenatally on ultrasound tended to be less complex and that maternal and neonatal outcomes in patients with prenatally undiagnosed placenta accreta were statistically similar to outcomes where impaired placentation had been diagnosed prenatally. This raises questions about the diagnostic accuracy of ultrasound for the detection of this entity. Ultrasound was found to be more accurate for the diagnosis of placenta percreta compared to placenta accreta [17].

As the prenatal diagnosis was not confirmed in our case, the decision to terminate the pregnancy in the 19th week of pregnancy must, in hindsight, be considered critically. Retrospectively it is possible to say that the hysterectomy might have been avoided. It must also be noted that continuing the pregnancy would have been possible despite the prenatal findings, but this would have involved incalculable maternal and fetal risks. This is made very clear by the intraoperative finding of concealed uterine rupture. After detailed discussions in which the patient was informed of the pros and cons of the various options in her specific situation, the mother of 4 children opted to terminate the pregnancy. This shows how much therapy decisions for placentation disorders are based on the individual's specific circumstances, particularly when definitive clinical evidence is lacking.

## Conclusion

Placentation disorders can present with heterogeneous symptoms of varying severity and clinical findings can differ. Placentation disorders should be considered in the differential diagnosis of woman who have previously had several uterine surgical interventions. Diagnosis is made using imaging techniques, primarily ultrasound, complemented by MRI where necessary. The therapy depends, in the first instance, on the type of placentation disorder and on whether the patient wishes to have children. In addition to expectant management and a number of experimental drug therapies, in most cases treatment consists of primary cesarean section, often performed early on, curettage and even hysterectomy. Our case report emphasizes the difficulty of making a definitive diagnosis of placentation disorder prenatally. It also illustrates the far-reaching consequences of cesarean sections and, above all, the impact repeated cesarean sections can have for affected women. This underlines how strict the indications for cesarean section should be. Nevertheless, the numbers of medically indicated cesarean sections have continued to increase in the last decades. Timely diagnosis of impaired placentation can help reduce the risk for affected women.

## Conflict of Interest

None.

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