

Pregnancy in women with uterine leiomyomas (fibroids)

Authors: David W Ouyang, MD, Errol R Norwitz, MD, PhD, MBA

Section Editor: Charles J Lockwood, MD, MHCM

Deputy Editor: Vanessa A Barss, MD, FACOG

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INTRODUCTION — Uterine fibroids (leiomyomas) are benign smooth muscle tumors of the uterus. The potential effects of fibroids on pregnancy and the potential effects of pregnancy on fibroids are a frequent clinical concern since these tumors are common in women of reproductive age. Most pregnant women with fibroids do not have any complications during pregnancy related to the fibroids. Pain is the most common problem, and there may be a slightly increased risk of obstetrical complications such as miscarriage, premature labor and delivery, abnormal fetal position, and placental abruption.

This topic will review issues specifically relating to pregnant women with uterine fibroids. Fibroids in nonpregnant women, including fertility issues, are discussed separately. (See "[Uterine leiomyomas \(fibroids\): Epidemiology, clinical features, diagnosis, and natural history](#)" and "[Reproductive issues in women with uterine leiomyomas \(fibroids\)](#)".)

LIMITATIONS OF AVAILABLE INFORMATION — Several factors make it difficult to assess the impact of fibroids on pregnancy outcome and identify specific fibroid characteristics that are important. For example, the mechanisms whereby fibroids may cause adverse obstetric outcomes are not clearly understood. In addition, available evidence is difficult to interpret due to the heterogeneity of the study populations in these reports, which differ in fibroid number, size, location (lower uterus, fundus), and type (submucosal, intramural, or subserosal; pedunculated or sessile); gestational age at diagnosis; and method of ascertainment (eg, prospective versus retrospective study design). Lastly, small fibroids (<4 to 5 cm) may not be detected consistently because they can be difficult to distinguish from physiologically thickened myometrium.

PREVALENCE — The prevalence of uterine fibroids in pregnancy varies between 1.6 and 10.7 percent, depending upon the trimester of assessment and the size threshold [1-5]. In one study, 4 percent of 12,708 pregnant patients had fibroids with a diameter >3 cm [2]. In another, 1.6 percent of 12,600 consecutive pregnant patients had fibroids >1 cm [3]. A third series in over 15,000 women with nonanomalous singleton pregnancies undergoing routine second trimester ultrasonography reported that 2.7 percent had fibroids ≥1 cm [1]. A fourth series of 4271 first trimester or post-miscarriage ultrasound examinations observed 10.7 percent of women had a fibroid of ≥0.5 cm [4]. (See "[Uterine leiomyomas \(fibroids\): Epidemiology, clinical features, diagnosis, and natural history](#)", section on 'Prevalence'.)

The prevalence of fibroids increases with age and is higher in African-American women than in white or Hispanic women [4]. Increasing parity and prolonged duration of breastfeeding are associated with a small, but statistically significant, reduction in prevalence [6].

CHANGE IN SIZE DURING PREGNANCY AND POSTPARTUM — Pregnancy-related increases in estrogen and progesterone levels, uterine blood flow, and possibly human chorionic gonadotropin levels, are believed to affect fibroid growth. Most studies that have sonographically monitored the size of fibroids across pregnancy have refuted the commonly held belief that fibroids increase in size throughout gestation [3,7-13], although there are exceptions [14-16]. It appears that fibroid size remains stable (<10 percent change) across gestation in 50 to 60 percent of cases, increases in 22 to 32 percent, and decreases in 8 to 27 percent [7,11,12].

Inconsistent data on the effect of pregnancy on fibroid growth may be due to the gestational age of the ultrasound assessments since the pattern of fibroid growth during pregnancy is probably not linear [7,11-14,17,18]. For example, in those fibroids that increase in size, most of the growth occurs in the first trimester, with little if any further increase in size during the second and third trimesters [7,11,12,16]. Larger fibroids (>5 cm in diameter) are more likely to grow, whereas smaller fibroids are more likely to remain stable in size [3]. The mean increase in fibroid volume during pregnancy is 12 percent, and very few fibroids increase by more than 25 percent [11,12].

Almost 90 percent of women with fibroids detected in the first trimester will have regression in total fibroid volume when re-evaluated three to six months postpartum, but 10 percent will have an increase in volume [19]. Regression may be less in women who use progestin-only contraception.

SYMPTOMS — Uterine fibroids are usually asymptomatic during pregnancy. In symptomatic women, symptoms include pain, pelvic pressure, and/or vaginal bleeding.

Pain is the most common symptom; the frequency correlates with size and is especially high in women with fibroids >5 cm in diameter [2,20]. Most patients have only localized pain, without other signs and symptoms, although mild leukocytosis, fever,

and nausea and vomiting can occur [21,22]. Fibroid pain typically presents in the late first or early second trimester, which corresponds to the period of greatest fibroid growth and, in turn, propensity to degeneration. Pain also may result from partial obstruction of the vessels supplying the fibroid as the uterus grows and changes its orientation to the fibroid [23], or from torsion. (See ['Degeneration and torsion'](#) below.)

Symptoms resulting from ectopic hormone production (eg, erythropoietin [24], parathyroid-related protein [25,26], prolactin) are rare.

COMPLICATIONS — Uterine fibroids have long been implicated as a cause of adverse pregnancy events [27]. However, there are no well-designed studies that provide high-quality data on the relationship between fibroids and pregnancy outcome. As discussed above (see ['Limitations of available information'](#) above), the available information consists largely of observational series and case reports that are limited by different patient populations; different criteria regarding the size, location, and number of fibroids; small numbers of adverse events; ascertainment bias in selecting study participants; and inadequate adjustment of confounders.

Most pregnant women with fibroids do not have any complications during pregnancy related to the fibroids [28]. When complications occur, painful degeneration is the most common complication. There also appears to be a slightly increased risk of complications such as miscarriage, premature labor and delivery, abnormal fetal position, and placental abruption, but all studies do not show an increased risk of adverse events. The following list of pregnancy complications begins with those most strongly associated with fibroids and ends with those least associated with fibroids.

Degeneration and torsion — As discussed above, pain is one of the most common symptoms of fibroids in pregnant women and is typically due to fibroid degeneration or, rarely, torsion. Rapid growth of fibroids can result in a relative decrease in perfusion, leading to ischemia and necrosis (red degeneration) and release of prostaglandins [29]. Pedunculated fibroids are at risk of torsion and necrosis, but this is much less common than degeneration.

The diagnosis of degeneration and torsion is reviewed separately.

Miscarriage — In some patients, submucosal fibroids appear to adversely affect implantation, placentation, and ongoing pregnancy. The effects of intramural fibroids are more controversial, while fibroids that are primarily subserosal or pedunculated are unlikely to cause adverse outcomes. The risk of pregnancy loss may be higher when there are multiple fibroids [30]. The mechanisms by which fibroids may cause pregnancy loss are not known; the following hypotheses have been proposed:

- The fibroid may interfere with placentation and development of normal uteroplacental circulation [31,32]. As an example, a large submucosal fibroid projecting into the uterine cavity may compress the decidualized endometrium, leading to decidual atrophy or distortion of the vascular architecture and blood flow supplying and draining the decidua at that site.
- Rapid fibroid growth with or without degeneration may lead to increased uterine contractility or altered production of catalytic enzymes by the placenta [32,33], both of which may disrupt placentation, leading to spontaneous abortion.

These issues are discussed in more detail separately. (See ["Reproductive issues in women with uterine leiomyomas \(fibroids\)"](#), section on ['Infertility and miscarriage'](#).)

Preterm labor and birth — There appears to be a small increase in preterm labor (unadjusted odds ratio [OR] 1.9, 95% CI 1.5-2.3 [34]) and preterm birth (unadjusted OR 1.5, 95% CI 1.3-1.7 [34]) in pregnancies with uterine fibroids [5,34-36]. Characteristics reported to increase this risk include multiple fibroids, placentation adjacent to or overlying the fibroid [7,10,37], and size greater than 5 cm [38]. As with other complications, this association is not consistent across the literature [2,39-41]. We do not consider fibroids an indication to monitor cervical length with ultrasound during pregnancy.

Various theories have been proposed to explain the biologic basis of preterm labor in the setting of uterine fibroids. As an example, it is possible that fibroid uteri are less distensible than nonfibroid uteri, so that contractions occur when the uterus distends beyond a certain point [20,31]. Others have noted decreased oxytocinase activity in the gravid fibroid uterus, which may result in a localized increase in oxytocin levels, thereby predisposing to premature contractions [33]. (See ["Pathogenesis of spontaneous preterm birth"](#), section on ['Pathologic uterine distention'](#) and ["Physiology of parturition"](#).)

Antepartum bleeding and placental abruption — Numerous studies have reported that antepartum bleeding is more common in pregnancies with fibroids [2,9,10,42], although not all studies were able to confirm this association [7,34,39]. The location of the fibroid in relation to the placenta appears to be an important determinant and implies that bleeding is related to abruption. Pooled cumulative data suggest the risk of abruption is increased threefold in women with fibroids (unadjusted OR 3.2, 95% CI 2.6-4.0) [34].

Submucosal and retroplacental fibroids and fibroids with volumes >200 mL (corresponding to 7 to 8 cm diameter) are associated with the highest risk of abruption [2,10,20,43]. As an example, in a retrospective analysis of 6706 consecutive pregnant patients, 8/14 patients (57 percent) with retroplacental fibroids developed placental abruption with the deaths of four fetuses, while only two abruptions occurred among the 79 patients (2.5 percent) whose fibroids were not retroplacental, and neither of these resulted in fetal death [20].

A hypothesis for the increased risk of abruption in women with fibroids is that the fibroid causes abnormal perfusion of the placental site [20]. When ¹³³Xenon was used to measure regional blood flow in the uteri of 11 nonpregnant patients undergoing laparotomy, blood flow was significantly reduced in the myometrium adjacent to fibroids [44]. The authors suggested that the decidua overlying a fibroid may have reduced blood flow, leading to placental ischemia and decidual necrosis, making the area more susceptible to antepartum bleeding and abruption. (See "[Placental abruption: Clinical features and diagnosis](#)" and "[Placental abruption: Management](#)".)

Malpresentation — Müllerian anomalies are associated with an increased risk of malpresentation, presumably because they distort the shape of the uterine cavity [45,46]. In the same way, large submucosal fibroids that distort the uterine cavity have been consistently associated with fetal malpresentation (unadjusted OR 2.9, 95% CI 2.6-3.2) [34]. One of the largest studies used a population-based cohort of over 72,000 consecutive women with singleton pregnancies in Washington State (1990 to 2007) who underwent routine second trimester fetal anatomic survey at a single university hospital [5]. This study reported a significant increase in breech presentation in women with fibroids (OR 1.5, 95% CI 1.3-1.9). Other studies noted an increased incidence of malpresentation only if the uterus had multiple fibroids, if there was a fibroid located behind the placenta or in the lower uterine segment, or if the fibroid was large (over 10 cm) [1,7,20,47].

Dysfunctional labor — Theoretically, fibroids in the myometrium may decrease the force of uterine contractions or disrupt the coordinated spread of the contractile wave, thereby leading to dysfunctional labor [41,48]. Several studies have reported an increased incidence of dysfunctional labor in pregnancies complicated by fibroids [41,42,49]; not all investigators have been able to confirm this association [1,39]. Higher rates of tachysystole (defined as >5 contractions in 10 minutes) have also been reported [50].

Cesarean delivery — Studies have consistently reported that uterine fibroids are associated with an increased risk of cesarean delivery (unadjusted OR 3.7, 95% CI 3.5-3.9 [34]), especially when the fibroids are located in the lower uterine segment [1,7,20,21,41,42,49,51-53]. The proposed increase in cesarean delivery rate is likely due to such factors as an increased risk of malpresentation (see "[Malpresentation](#)" above), dysfunctional labor (see "[Dysfunctional labor](#)" above), obstruction, and placental abruption (see "[Antepartum bleeding and placental abruption](#)" above). However, most of these studies were biased in their selection of cases, so a causal association is unproven.

Postpartum hemorrhage — Several studies have reported an increased risk of postpartum hemorrhage in pregnancies complicated by fibroids (unadjusted OR 1.8, 95% CI 1.4-2.2 [34]) [1,43,49], especially if the fibroids are large (>3 cm) and located behind the placenta [9,29,47] or the delivery is by cesarean [49]. Numerous other studies have found no association between fibroids and postpartum hemorrhage [7,39,41]. Pathophysiologically, fibroids could predispose to postpartum hemorrhage by decreasing both the force and coordination of uterine contractions, thereby leading to uterine atony [48].

Fetal anomalies — Spatial restrictions from uterine fibroids can cause fetal deformations, but this is extremely rare. Case reports have described fetal anomalies including limb reduction defects, congenital torticollis, and head deformities in pregnancies with large submucosal fibroids [54-56].

Preterm premature rupture of membranes — Pooled cumulative data suggest that fibroids do not increase the risk of premature rupture of membranes and may even slightly decrease the risk [34]. However, individual studies have reported conflicting findings [1,2,5,9,39-42,57]. The location of the fibroid in relation to the placenta may be an important determinant: the greatest risk of preterm premature rupture of membranes appears to be when the fibroid is in direct contact with the placenta [9].

Placenta previa — Most studies that account for maternal age and prior uterine surgery failed to show any association between fibroids and placenta previa [7,40-42,51], although two large series reported an increased rate (1.4 versus 0.5 percent in controls [5], 3.8 versus 2.0 percent in controls [1]). The latter series adjusted for prior cesarean delivery and myomectomy.

Fetal growth restriction — Fibroids have minimal, if any, affect on fetal growth (unadjusted OR 1.4, 95% CI 1.1-1.7 [34]) [2,7,20,39-41,51]. It is possible, however, that large fibroids (greater than 200 mL) may be associated with delivery of small-for-gestational age infants (<10th percentile for gestational age) [12].

Other complications — A number of other pregnancy complications have been reported in women with fibroids, including disseminated intravascular coagulation, spontaneous hemoperitoneum, uterine incarceration, urinary tract obstruction with urinary retention or acute renal failure, deep vein thrombosis, and puerperal uterine inversion [47,58-61]. (See "[Incarcerated gravid uterus](#)" and "[Puerperal uterine inversion](#)".)

Pyomyoma (suppurative leiomyoma) is rare [62-66]. Clinical findings may include fever, leukocytosis, tachycardia, pelvic pain, and characteristic features on imaging studies (heterogeneous mass that may contain gas).

Fetal demise — Rates of intrauterine fetal demise are not increased in pregnancies complicated by uterine fibroids [42,51].

Preeclampsia — The majority of studies do not support an association between fibroids and preeclampsia [39,40,42], although one study noted that women with multiple fibroids were significantly more likely to develop preeclampsia than those with a single fibroid (45 versus 13 percent) [39]. The authors suggested that the increased risk was due to disruption of trophoblast

invasion by the multiple fibroids leading to inadequate uteroplacental vascular remodeling leading to the development of preeclampsia.

MANAGEMENT ISSUES

Indications for preconception myomectomy — Decisions regarding preconception myomectomy are made on a case-by-case basis and depend on several factors, including the age of the patient, her past reproductive history, the severity of her symptoms, and the size and location of the fibroids. These issues are reviewed elsewhere:

- (See "[Reproductive issues in women with uterine leiomyomas \(fibroids\)](#)", section on 'Preconceptional planning'.)
- (See "[Reproductive issues in women with uterine leiomyomas \(fibroids\)](#)", section on 'Infertility and miscarriage'.)
- (See "[Definition and etiology of recurrent pregnancy loss](#)", section on 'Leiomyoma'.)
- (See "[Management of couples with recurrent pregnancy loss](#)", section on 'Uterine abnormalities'.)

Indications for myomectomy during pregnancy or at delivery — Given the potential for harm (hemorrhage, uterine rupture, miscarriage or preterm delivery), myomectomy is avoided during pregnancy and at delivery, especially if an intramyometrial incision is required, unless the procedure cannot be safely delayed [2,21,29,41,67-73]. Uncontrollable hemorrhage during myomectomy may necessitate hysterectomy.

Rarely, myomectomy of pedunculated or subserosal fibroids has been performed antepartum for management of an acute abdomen or obstruction, and myomectomy may be required at cesarean delivery in order to close the hysterotomy [74]. A case report described successful control of postpartum hemorrhage after removal of a large submucosal fibroid in a woman with uterine atony and a placenta that was focally adherent to the fibroid [75].

Painful fibroids — Pregnant women with painful fibroids may require hospitalization for pain management [2,39,47,49]. We suggest supportive care and administration of [acetaminophen](#) as the initial intervention.

Short-term use of opioids in standard doses or a course of nonsteroidal anti-inflammatory drugs (NSAIDs) can be given when pain is not controlled by these measures. First trimester opioid use has been associated with an increased risk of congenital anomalies in some studies, but the data are weak and do not justify withholding these medications when needed to control pain. (See "[Prenatal care: Patient education, health promotion, and safety of commonly used drugs](#)", section on 'Pain and fever medications'.)

Pain may be managed with a short course of [ibuprofen](#) [21]. [Indomethacin](#) 25 mg orally every 6 hours for up to 48 hours is another NSAID that has been effective [22]. Therapy should be limited to pregnancies less than 32 weeks of gestation because of the possibility of inducing premature closure of the ductus arteriosus, neonatal pulmonary hypertension, oligohydramnios, and fetal/neonatal platelet dysfunction [22,76-78]. If indomethacin is continued for >48 hours, weekly sonographic assessment for oligohydramnios and narrowing of the fetal ductus arteriosus should be performed. If either of these findings is noted, indomethacin should either be discontinued or reduced to 25 mg every 12 hours. Repeat courses can be given as needed for recurrent episodes of pain. Although first trimester use of NSAIDs has been associated with miscarriage in some studies, the best data do not support an association [79]. (See "[Inhibition of acute preterm labor](#)", section on 'Cyclooxygenase inhibitors' and "[Use of antiinflammatory and immunosuppressive drugs in rheumatic diseases during pregnancy and lactation](#)", section on 'NSAIDs and moderate to high-dose aspirin'.)

Case reports have described successful use of epidural analgesia for treatment of severe pain refractory to other therapies [80-82].

Fibroids prolapsing into the vagina — We generally advise against elective removal of prolapsed fibroids in pregnancy as the risks likely outweigh the benefits, unless there is an easily accessible pedunculated fibroid on a thin stalk. Removal may lead to hemorrhage, rupture of membranes, and/or pregnancy loss.

The need for resection should be assessed on a case-by-case basis. Clinically significant bleeding, excessive pain, urinary retention, and (rarely) infection during pregnancy due a prolapsed fibroid are reasonable indications for resection. Symptomatic fibroids in pregnant women have been successfully removed transvaginally [83,84]. The procedure for transvaginal myomectomy depends on the origin of the fibroid (cervix versus submucosa) and thickness of the stalk/base, which can be determined clinically or by transvaginal ultrasound or magnetic resonance imaging, if necessary. An asymptomatic lower uterine segment submucosal prolapsed fibroid may become intrauterine with advancing gestation.

Route of delivery — Most women with fibroids will have a successful vaginal delivery and thus should be offered a trial of labor. Cesarean delivery is reserved for standard obstetrical indications (eg, malpresentation, failure to progress). Elective cesarean delivery may be considered because of concerns that fetal descent will be obstructed, but should be limited to women most likely to fail a trial of labor: those with large cervical fibroids or with lower uterine segment fibroids that distort the uterine cavity and are located between the fetal vertex and cervix in the third trimester [85].

Operative issues at cesarean delivery — A third trimester hemoglobin level of at least 9.5 to 10 mg/dL is desirable in women at high risk of intrapartum or postpartum hemorrhage at the time of cesarean delivery, such as women with large, retroplacental

or anterior lower uterine segment fibroids (see ["Treatment of iron deficiency anemia in adults"](#)). Preoperative placement of bilateral iliac artery balloon catheters, use of a cell saver, and availability of blood products in a cooler should be considered on a case-by-case basis.

A vertical skin incision and a posterior or classical hysterotomy are sometimes necessary to obtain adequate exposure when the fibroids are located in the lower uterine segment. Every effort should be made to avoid transecting a fibroid during hysterotomy as the incision may be impossible to close without first removing the tumor.

We limit elective myomectomy at cesarean delivery to patients with symptomatic pedunculated fibroids. We avoid intramyometrial myomectomy because of the risk of severe hemorrhage, which is more likely in pregnant women since the term uterus receives 17 percent of cardiac output [31,71]. In a case series of nine patients who underwent myomectomy at the time of cesarean delivery, three (33 percent) were complicated by severe hemorrhage requiring puerperal hysterectomy [2]. In another report of 25 myomectomies performed at the time of cesarean delivery, five patients (20 percent) received blood transfusions, although none required hysterectomy [86]. A similar study of 13 intrapartum myomectomies reported that one case (8 percent) was complicated by severe hemorrhage requiring blood transfusion and uterine artery ligation [67]. More favorable results have been reported with removal of pedunculated fibroids at the time of cesarean delivery. In a series of five myomectomies performed during cesarean, the four pedunculated fibroids were removed without difficulty, while removal of the single nonpedunculated fibroid was associated with severe hemorrhage [49]. (See ["Abdominal myomectomy"](#), section on 'Procedure'.)

Other interventions to minimize maternal morbidity are under investigation. In a pilot study, uterine artery ligation at the time of cesarean delivery appeared to enhance shrinkage of fibroids postpartum [87], but further clinical studies and risk/benefit analyses are needed before such an intervention can be recommended.

Management of patients with prior myomectomy

Route of delivery and timing of scheduled cesarean delivery — In the absence of strong evidence of the absolute risk of rupture [88], we take a conservative approach and suggest cesarean delivery prior to the onset of labor if we believe the myometrium was significantly compromised by previous surgery, such as if the uterine cavity was entered or nearly entered during a prior myomectomy or a large number of myomas were removed. We support the committee opinion by the American College of Obstetricians and Gynecologists (ACOG) recommending that women with previous myomectomy undergo cesarean delivery between 37^{0/7}th and 38^{6/7}th weeks of gestation, although consideration of delivery as early as 36 weeks is reasonable for women with prior extensive myomectomy (analogous to a patient with prior classical hysterotomy) [89].

For patients who have had an intramyometrial myomectomy that was unlikely to have significantly compromised the myometrium, we suggest a trial of labor with continuous intrapartum fetal monitoring, early access to obstetric anesthesia, and the ability to perform an emergent cesarean delivery, if it becomes necessary. Patients who have had a pedunculated fibroid removed would not be expected to have compromised the integrity of the myometrium and do not require special monitoring during labor.

The magnitude of the risk of uterine rupture in pregnancies after myomectomy and specific criteria associated with increased risk are difficult to ascertain because of the small number of cases reported and lack of detail about the operative procedures performed. Available data, although limited, suggest that the risk of uterine rupture after myomectomy is not significantly greater than that for a patient attempting trial of labor after cesarean in labor. In a 2016 systematic review of studies with at least five cases of pregnancy after myomectomy, the overall incidence of uterine rupture after myomectomy was 7/756 or 0.93 percent (95% CI 0.45-1.92 percent) [90]. The incidence was 0.47 percent (2/426, 95% CI 0.13-1.70 percent) in women undergoing trial of labor after myomectomy and 1.52 percent (5/330, 95% CI 0.65-3.51 percent) in women before the onset of labor; this difference was not statistically significant. Six of the seven ruptures occurred in women who had a prior laparoscopic myomectomy, which has been attributed to the technical challenge of laparoscopic suturing [91,92]. All ruptures occurred following myomectomy of an intramural fibroid, although this was not noted to be a significant risk factor for uterine rupture. The uterine cavity was not entered during myomectomy in three cases; this information was not available in the other four cases. The ruptures occurred at 24 (twins), 25, 30, 32, 36, 37, and 40 weeks of gestation; however, this finding may be biased by scheduled cesarean deliveries at term.

Abnormal placentation — Prior hysteroscopic removal of a submucosal fibroid may increase the risk of abnormal placentation, especially placenta accreta. Although the risk of placenta accreta after prior myomectomy appears to be low [93,94], data are sparse. We suggest ultrasound screening for possible placenta accreta in the late second or early third trimester. (See ["Clinical features and diagnosis of the morbidly adherent placenta \(placenta accreta, increta, and percreta\)"](#).)

SUMMARY AND RECOMMENDATIONS

- The pattern of fibroid growth during pregnancy is probably not linear: Most of the growth occurs in the first trimester, with little if any further increase in size during the second and third trimesters. (See ["Change in size during pregnancy and postpartum"](#) above.)

- Most pregnant women with fibroids do not have any complications during pregnancy related to the fibroids. When complications occur, pain is the most common complication. The frequency of pain correlates with increasing fibroid size. (See '[Complications](#)' above and '[Degeneration and torsion](#)' above.)

Size and location appear to be risk factors for pregnancy complications: large size (>3 cm), retroplacental location, and/or distortion of the uterine cavity are characteristics that have been associated with an increased risk of miscarriage, placental abruption, fetal growth restriction, hemorrhage, and preterm labor and birth. The presence of multiple fibroids is another risk factor for preterm labor and birth. (See '[Complications](#)' above.)

- Every effort should be made to avoid surgical removal of fibroids in pregnancy because of the risk of significant morbidity (hemorrhage). Myomectomy is performed if the procedure cannot be safely delayed. (See '[Indications for myomectomy during pregnancy or at delivery](#)' above.)
- Prior hysteroscopic removal of a submucosal fibroid may increase the risk of abnormal placentation, especially placenta accreta. Although the risk of placenta accreta after prior myomectomy appears to be low, we suggest ultrasound examination for possible placenta accreta in the late second or early third trimester. (See '[Abnormal placentation](#)' above.)
- For pregnant women with painful fibroids, we suggest supportive care and administration of [acetaminophen](#) as the initial intervention. Short-term use of opioids in standard doses or a course of nonsteroidal anti-inflammatory drugs (NSAIDs) can be given when pain is not controlled by these measures. (See '[Painful fibroids](#)' above.)
- For pregnant women with a prolapsed fibroid, clinically significant bleeding, excessive pain, urinary retention, or infection is a reasonable indication for resection. (See '[Fibroids prolapsing into the vagina](#)' above.)
- Cesarean delivery is performed for standard obstetrical indications (eg, malpresentation, failure to progress), including obstruction of the birth canal by a fibroid. (See '[Route of delivery](#)' above.)
- If the uterine cavity was entered during a prior myomectomy or a large number of myomas were removed, we suggest scheduled cesarean delivery rather than a trial of labor (**Grade 2C**). In the absence of these criteria, we manage patients with a prior myomectomy similar to women who have had a prior cesarean delivery. (See '[Management of patients with prior myomectomy](#)' above.)

Scheduled cesarean delivery is performed between 37^{0/7th} and 38^{6/7th} weeks of gestation, although consideration of delivery as early as 36 weeks is reasonable for women with prior extensive myomectomy (analogous to a patient with prior classical hysterotomy).

- Every effort should be made to avoid cutting through fibroids at cesarean delivery as it can be impossible to close the hysterotomy site if the fibroids are in it. (See '[Route of delivery](#)' above.)

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