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Review

Fibroids in pregnancy: management and outcomes

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Key content
- In pregnancy, fibroids can lead to complications such as placental abruption and increased caesarean section rates.
- Surgical intervention of fibroids within the first two trimesters is possible in selected women.
- Increasing evidence suggests that myomectomy can be performed concurrently with caesarean section without an increased risk of blood transfusion or hysterectomy.
- Adverse outcomes are associated with subsequent pregnancies following uterine artery embolisation.

Learning objectives
- To outline the complications of fibroids and treatment options in pregnancy.
- To determine pregnancy outcomes in those previously treated for uterine fibroids, including with uterine artery embolisation and ulipristal acetate.
- To discuss the mode of delivery in women with a previous myomectomy.

Ethical issues
- With the provision of informed consent, should women with a previous myomectomy be encouraged to proceed with vaginal delivery?
- A greater rate of certain complications has been observed in pregnancies that follow uterine artery embolisation. Should this information be provided routinely?

Keywords: fibroid / myomectomy / pregnancy / surgical treatment / uterine artery embolisation

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Introduction

Fibroids (leiomyomas) are the most common pelvic tumour in pregnancy, with a prevalence of 10.7% in the first trimester.[1] Fibroids are more common in women originating from South Asian, African and Middle Eastern subcontinents.

Fibroids are associated with advancing maternal age.[2] Most fibroids are innocent and have no effect on pregnancy. However, some fibroids adversely affect pregnancy outcomes.

The 2015 MBRRACE (Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries) report found postpartum haemorrhage (PPH) to be the second most prevalent cause of direct maternal mortality.[3] Uterine fibroids represent one of the most challenging causes of PPH, which can result in peripartum hysterectomy. Fibroids are also associated with malpresentation, preterm labour and an increase in caesarean section rates.[4]

The UK currently has no national guidance on the management of fibroids in pregnancy. This article discusses the complications of fibroids and their management options in pregnancy.

Classification of fibroids

Fibroids are located within the body of the uterus, cervix or broad ligament. Fibroids within the uterine body are either submucosal, intramural or subserosal (Figure 1).[5] Submucosal fibroids are located on the inner wall of the myometrium and are particularly associated with miscarriages, bleeding and subfertility.[4] Subserosal fibroids project from the outer surface of the uterus. Intramural fibroids are located within the muscular wall of the uterus. Pedunculated fibroids are attached to the uterus via a stalk. Broad ligament fibroids are located between the two layers of the broad ligament and are responsible for dextrorotation of the uterus. Cervical fibroids can lead to a failure of fetal head engagement and malpresentation. They also pose a challenge during surgery.

The effect of pregnancy on fibroids

Despite traditional teaching that fibroids increase in size during pregnancy, ultrasonographic surveillance of fibroids suggests that pregnancy has various effects on fibroid size. A study of 72 women[6] found that fibroids remained virtually the same size antenatally, while another study of 107 women[7] found that most fibroids decreased in size during the antenatal period. Any potential increase in size may be more likely in the first trimester than the third trimester.[8] Fibroids located close to the cervix may migrate upwards with advancing pregnancy, following the development of the lower uterine segment.

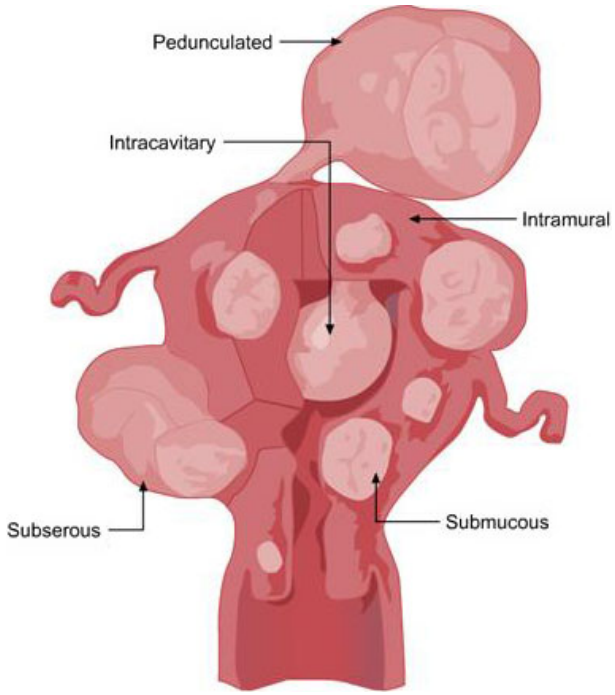

Figure 1. The classification of fibroids within the uterine body based on location.

The effect of fibroids on the pregnancy

Between 10 and 30% of women with fibroids will develop a pregnancy complication.[9] Complications are more likely to occur with fibroids greater than 200 cm^3 in volume compared with those with volumes of less than 100 cm^3.[8]

Maternal outcomes

Maternal pain is the most common complication relating to fibroids in pregnancy. Pain is more evident with fibroids greater than 5 cm in diameter and during the second and third trimesters.[9,10] It is often related to red degeneration of fibroids or torsion of a pedunculated fibroid, where prostaglandins are released as a result of cell damage.[9] Fibroids can also cause pressure symptoms.

Obstetric outcomes with fibroids were analysed in a large study (Table 1).[4] The rate of certain outcomes including preterm labour, placental abruption and caesarean section, were significantly higher in those with fibroids.

Women with uterine fibroids have the potential to bleed significantly in pregnancy. Large fibroids, submucosal subtypes and those located adjacent to the placental site lead to a greater risk of placental abruption[11] because of a reduction in blood flow to the placenta and consequent ischaemic damage.[10,12] Fibroids double the risk of placenta praevia in pregnancy, even after adjusting for previous uterine surgery.[4,11] Fibroids are responsible for bleeding after delivery by mechanically interfering with restoration of muscle fibres, which impacts on the contractility of the uterus.[13]

Fibroids located within the lower uterine segment are especially associated with higher caesarean section rates and retained placentas.

Fetal outcomes

Fibroids are associated with higher rates of miscarriage in the first trimester. One study found higher miscarriage rates in those with fibroids (14%) than those without (8%).[14] Furthermore, miscarriage rates were higher in women with fibroids located within the body of the uterus compared with fibroids located low in the uterus.[15] Possible mechanisms include compressive effects from fibroids, an increase in contractility of the uterus, and a redirection in the uterine blood supply from the developing fetus.[16]

Rarely, fibroids are associated with fetal anomalies, possibly caused by compression effects from large submucosal fibroids. Structural anomalies including limb reduction defects, dolichocephaly (lateral compression of the fetal skull) and torticollis (abnormal twisting of the neck) have been reported.[17–19]

Multiple fibroids, large fibroids (greater than 5 cm in diameter) and lower segment fibroids have been described separately as risk factors for fetal malpresentation.[11,15,20,21]

Preconception period

Fertility

Subfertility has been reported in 5–10% of women with fibroids.[22] Possible mechanisms include a distortion of fallopian tubes affecting entry of spermatozoa into the uterine cavity, a distortive effect on the endometrium inhibiting implantation and the creation of a hyperestrogenic environment.[22]

Subserosal fibroids do not appear to affect fertility, while submucosal fibroids affect clinical pregnancy and live birth rates. The role of intramural fibroids remain uncertain.[23]

The Canadian national guideline recommends the removal of submucosal fibroids in women with otherwise unexplained subfertility.[23] In the presence of intramural fibroids, assessment should exclude uterine cavity distortion and, if this is the case, an individualised approach should be adopted. Two-thirds of women conceive following abdominal myomectomy where no other identifiable causes for subfertility exist.[24]

Medical management of fibroids in pregnancy

Most medical treatments for fibroids are contraindicated during pregnancy and breastfeeding, while others have

Table 1. A comparison of obstetric outcomes in women with fibroids and without fibroids[4]

Outcome	Women with fibroids	Women without fibroids	Statistically significant? (*P* values <0.05)
Maternal			
Failure to progress	260/3471 (7.5%)	4703/148 778 (3.2%)	Yes
Placental abruption	115/4159 (2.8%)	517/60 474 (0.9%)	Yes
Placenta praevia	50/3608 (1.4%)	924/154 334 (0.6%)	Yes
Chorio- or endometritis	78/893 (8.7%)	2149/26 090 (8.2%)	No
Caesarean section	2098/4322 (48.5%)	22 989/173 052 (13.3%)	Yes
PPH	87/3535 (2.5%)	2130/153 631 (1.4%)	Yes
Retained placenta	15/1069 (1.4%)	839/134 685 (0.6%)	Yes
Fetal			
Preterm labour	116/721 (16.1%)	1577/18 187 (8.7%)	Yes
PPROM	123/1247 (9.9%)	7319/56 418 (13.0%)	Yes
FGR	112/961 (11.7%)	3575/41 630 (8.6%)	Yes
Malpresentation	466/3585 (13.0%)	5864/130 932 (4.5%)	Yes

Key: PPH = postpartum haemorrhage; PPROM = preterm prelabour rupture of membranes; FGR = fetal growth restriction

unknown effects (Table 2).[25,26] With the exception of tranexamic acid and selective use of non-steroidal anti-inflammatory drugs (NSAIDs), discontinuation of certain medications is advised before conception (Table 2). Tranexamic acid is important in the management of postpartum haemorrhage. Its use has also been described in the prevention of intrapartum bleeding complications, and for treating placental abruption. It has not been linked to adverse fetal outcomes.[26] NSAIDs should be avoided in the third trimester because of the risk of oligohydramnios.

Use of the progesterone receptor antagonist ulipristal acetate (UPA) is increasing for the medical management of symptomatic fibroids. The importance of discontinuing UPA before pregnancy was highlighted by a small retrospective study from Belgium in 2014,[27] which observed multiple adverse obstetric outcomes with antenatal UPA exposure. These included a 33% miscarriage rate (6/18 pregnancies), preeclampsia and preterm delivery in 25% (3/12 continuing pregnancies), a caesarean section rate of 92% (11/12 continuing pregnancies) and fetal malformation (ectopic kidney) in 8.3% (1/12 continuing pregnancies).[27]

Uterine artery embolisation

Some women conceive following uterine artery embolisation (UAE) for the treatment of fibroids. A meta-analysis of 227 women[28] to determine the outcome of pregnancies following UAE clearly demonstrated a higher rate of miscarriage, caesarean section and PPH, but not fetal growth restriction, malpresentation or preterm labour (Table 3).[28] Adhesions within the endometrial cavity, remnants of infarcted fibroids and ischaemia at sites of possible implantation help to explain the higher risk of miscarriage following UAE.[29]

There is also increasing evidence that placenta accreta complicates pregnancies following UAE. A multicentre Canadian study showed that 11% of mothers developed placenta accreta following UAE.[30] One explanation is the creation of a myometrial defect following fibroid infarction,[31] and also endometrial ischaemia.

The associated risks of UAE in pregnancy mean that it should not be routinely offered to women aiming to conceive.[32]

Antenatal

Women with fibroids with a diameter greater than 3 cm, or those located adjacent to the placental site or cervix, should be considered for consultant-led care to discuss the implications in pregnancy and to ensure timely management.

Treatment and prevention of anaemia prior to delivery is essential to reduce complications from major haemorrhage and the consequent need for blood transfusion or other blood products. Discussions surrounding the use of cell salvage should be held if haemorrhage is anticipated.

While the precise definition of a large fibroid is unclear, women with such fibroids are advised to undergo serial growth scans as symphysial fundal height measurements become inaccurate.[33] Regular ultrasonographic surveillance also permits the identification of rapidly enlarging fibroids, those that appear suspicious of malignancy, and to detect fetal malpresentation in the latter stages of pregnancy. Further imaging modalities such as magnetic resonance imaging (MRI) may provide further information about fibroids that appear suspicious of malignancy or that are difficult to define using ultrasound. Guidance from the USA suggests that MRI is safe for the developing fetus.[34]

In women with fibroids, abdominal pain may be caused by red degeneration or torsion of fibroids. Fibroid pain presents most commonly in the second or third trimesters. It is important to check the viability of the fetus and to exclude other causes of

Table 2. The safety of pharmacological agents used for the treatment of fibroids, in pregnancy and breastfeeding[25,26]

Medication Comments	Safe in pregnancy?	Comments	Safe while	breastfeeding?
Tranexamic acid	Yes	May be used if necessary, though menstruation effects not relevant.	Yes – if no further risk of VTE	Small amount only in breastmilk
Mefenamic acid	Unknown	There is a known risk with NSAIDs in general, especially in the third trimester, of pulmonary hypertension, NEC, intracranial haemorrhage, oligohydramnios and premature closure of the fetal ductus arteriosus. There is a lack of data for mefenamic acid specifically.	Yes	Amount in breastmilk too small to be harmful
Ulipristal	Unknown	Manufacturer advises to avoid (lack of data)	Unknown	Manufacturer advises to avoid (lack of data)
GnRH agonists Nil else	Contraindicated	Nil else		Contraindicated
Danazol	Avoid	Nil else	Avoid	Nil else
Aromatase inhibitors	Avoid	Nil else	Avoid	Nil else
Norethisterone	Unknown	Nil else	Yes	Safe though high doses may supress lactation
NSAIDs (for pain)	Conflicting data on congenital malformations. No association with stillbirth, fetal growth restriction or preterm labour.	See above as for mefenamic acid. Avoid in the third trimester.	Yes	Nil else

Key: VTE = venous thromboembolism; NSAIDs = nonsteroidal anti-inflammatory drugs; NEC = necrotising enterocolitis; GnRH = gonadotropin-releasing hormone agonist

Table 3. Comparison of outcomes in pregnancies following uterine artery embolisation with women with fibroids who did not undergo embolisation[28]

Outcome	Pregnancies following UAE	Controls that had fibroids and did not undergo UAE	Statistically significant (*P* values <0.05)
Miscarriage	80/227 (35.2%)	185/1121 (16.5%)	Yes
Fetal growth restriction (birthweight below the 5th centile)	7/96 (7.3%)	112/961 (11.7%)	No
Preterm labour	17/121 (14%)	183/1145 (16%)	No
Malpresentation	10/96 (10.4%)	466/3585 (13.0%)	No
Caesarean section	93/141 (66%)	2098/4322 (48.5%)	Yes
PPH	14/101 (13.9%)	87/3535 (2.5%)	Yes

Key: UAE = uterine artery embolization; PPH = postpartum haemorrhage

abdominal pain and preterm labour. In women with known fibroids and who present with acute pain, an ultrasound may yield useful information. Heterogeneous echogenic patterns or cystic changes within fibroids on ultrasound suggests red degeneration, although these are not specific.[16]

Fibroid pain may require hospital admission and the use of a hierarchy of analgesics. Paracetamol and opiate-based analgesia are safe in pregnancy. Ibuprofen is the most effective analgesic used for relieving fibroid pain.[4] Caution with NSAIDs is needed in the third trimester, especially if used for more than 48 hours.[16] Surgical intervention has been described in the event of lack of response.

Antenatal myomectomy may be required for severe pain from a degenerating fibroid, a large or rapidly enlarging fibroid, fibroids greater than 5 cm in diameter within the lower uterine segment, or torsion of a pedunculated fibroid. The

most suitable time to undertake a myomectomy is considered to be during the first and second trimesters.[12,35–41] The basis for antenatal myomectomy stems only from case reports and small case series of up to 18 women. Furthermore, these historical studies were not from the UK. Table 4 shows the results of a comparative study of 18 women who underwent an antenatal myomectomy.[39]

Importantly, and for unknown reasons, antenatal myomectomy appears to increase the rate of caesarean section.[12,35,37–41] Concerns over a potential risk of uterine rupture in some studies, if vaginal delivery is attempted, may help to explain this higher percentage. The lack of robust evidence means that antenatal myomectomy is not standard practice in the UK and should be only considered under the specific circumstances mentioned. Consideration must also be given to the transfer of women to centres with expertise in performing such procedures.

Uterine fibroids are not a contraindication to external cephalic version (ECV)[42] and this may be considered in women with malpresentation. No studies have evaluated the success rates of ECV in women with uterine fibroids.

Delivery after myomectomy

Women with a previous myomectomy and a breach of the endometrial cavity are sometimes advised to deliver by caesarean section to reduce the risk of uterine rupture.[43]

Conversely, some advocate that the myometrium, rather than the endometrium, provides strength to the uterine wall and recommend a caesarean section if more than 50% of the thickness of the myometrium is disrupted at the time of myomectomy.[44]

Another review advised that women with previous myomectomies in which large defects within the active segment of the uterus were found should be offered a caesarean section. The authors concluded that the total size of the defect, rather than any breach within the endometrial cavity, increased the risk of uterine rupture.[24]

Women may have also undergone a previous laparoscopic myomectomy. A large meta-analysis of 2017 pregnancies following laparoscopic myomectomy suggested a risk of 1.2% of uterine rupture.[45] Another study of 65 women quoted an even higher risk of 6.8% after laparoscopic myomectomy.[46] This risk appears to be higher than that of open myomectomy, which is 0.4%. While Canadian national guidelines state that having this procedure should not be an absolute contraindication to vaginal delivery,[47,48] they acknowledge the lack of evidence in deciding the mode of delivery following a laparoscopic myomectomy.[49] Further, these guidelines describe that, for women who suffer uterine rupture following laparoscopic myomectomy, this may be a result of the difficulty in performing a multilayer closure of the myometrium at the time of the laparoscopic procedure. The use of excessive diathermy is also believed to weaken surrounding tissues.

Some have quoted a 90% successful rate of vaginal delivery following open and laparoscopic myomectomy.[45] The lack of robust data led the authors of this article to advise that individualised recommendations should be made for such women. A review of operative findings at the time of myomectomy may yield invaluable information in planning a subsequent delivery.

The time interval between myomectomy and delivery may be relevant. Following open myomectomy, MRI evidence suggests that the endometrium should be fully healed 12 weeks after the procedure.[50] Canadian guidance recommends at least a 6-month interval between a laparoscopic myomectomy and subsequent conceptions.[49,51]

The presence of asymptomatic fibroids should not dictate the timing of delivery. Concerns over a risk of spontaneous uterine rupture mean that the babies of many women are delivered by 37 weeks of gestation. An evaluation of 176 women with a previous myomectomy,[43] where the mean gestational length at the time of delivery was 37.3 weeks, found no cases of uterine rupture. In view of the general lack of evidence, Canadian guidelines advocate close follow-up in such women.[49]

Table 4. Comparison of outcomes in women with fibroids who did and did not undergo antepartum myomectomy[39]

Outcome	Women who underwent antepartum myomectomy	Women who did not undergo antepartum myomectomy
Miscarriage	0/18 0%	12/88 (13.6%)
PPROM	1/18 (5.6%)	20/88 (22.7%)
FGR	1/18 (5.6%)	4/88 (4.5%)
Preterm delivery	1/18 (5.6%)	19/88 (21.6%)
Caesarean section	17/18 (94.4%)	30/88 (34.1%)
Peripartum hysterectomy	0/18 0%	4/88 (4.5%)
Apgar score ≤7	0/18 0%	1/88 (1.1%)
Birthweight <2.5 kg	1/18 (5.6%)	8/88 (9.1%)

Key: PPROM = preterm prelabour rupture of membranes; FGR = fetal growth restriction

Intrapartum care

Vaginal delivery

In view of the increased risk of PPH and other associated complications, women with fibroids, with or without a history of a myomectomy, are often advised to deliver their babies within high-risk units with facilities for blood transfusion, caesarean section and cell salvage. Vaginal delivery may be attempted in women with fibroids without cervical fibroids, which can obstruct labour, or those causing fetal malpresentation. Elective caesarean section should be

considered if there is a history of previous myomectomy, especially if the endometrial cavity was breached, the resultant defect was large, or a laparoscopic myomectomy was performed for intramural or submucosal fibroids.

For those attempting labour, it is crucial to ensure the fetus is cephalic. In women with a previous myomectomy who are deemed suitable for vaginal delivery, it is imperative to recommend continuous fetal heart monitoring to detect early signs of uterine rupture during labour. Intravenous access should also be secured to aid a timely response to suspected uterine rupture. A full blood count and group and save samples should be requested early. Some authorities suggest extending the use of oxytocic infusions from 12 hours to 24 hours following delivery to reduce the risk of PPH.[52,53] If not contraindicated, intramuscular ergometrine serves as a potent uterotonic, with a relatively long duration of action.

In the event of a major haemorrhage following a vaginal delivery, and with concomitant use of oxytocics, balloon tamponade may be attempted. Uterine packing can be considered if large submucosal fibroids interfere with the correct placement of a balloon. With continuing torrential bleeding, the 'major obstetric haemorrhage protocol' should be instigated, and facilities for cell salvage and interventional radiology utilised. Uterine compression sutures, internal iliac artery ligation, uterine tourniquet,[54] bilateral uterine artery ligation and peripartum hysterectomy are all well documented.[55]

Caesarean section

Consent for caesarean section in women with large or cervical fibroids must include knowledge of the risk of hysterectomy, admission to intensive care and modified skin incisions. The incision used may be located vertically in the midline for reasons including cervical fibroids, for those requiring a classical uterine incision or in those for whom significant pelvic adhesions are anticipated.

The uterine incision should be made away from any fibroid to reduce the risk of torrential bleeding. A distance of 2 cm is considered a safe distance. Fibroids can interfere with the feasibility of a caesarean section. Particular difficulty can be encountered with cervical fibroids, and gaining access to the lower uterine segment often mandates a classical caesarean in such cases. The length of a classical uterine incision should be at least 10 cm.[56] Broad ligament fibroids can result in dextrorotation of the uterus, and identifying key anatomical landmarks such as round ligaments and fallopian tubes may assist orientation. Dextrorotation should be corrected prior to any uterine incision. Cell savage should also be utilised where possible.

Pelvic adhesions pose a potential problem in women with a previous myomectomy. A subumbilical midline incision should be considered in women known to have significant pelvic adhesions.[56] Care must be taken in such cases, where the bladder may be higher than anticipated. Interestingly, no adhesions were found in one small series of five women following laparoscopic myomectomy.[57]

Uterine artery ligation undertaken immediately following a caesarean section has been prospectively evaluated. This procedure decreased blood loss and reduced the risk of a myomectomy or hysterectomy.[58] In those requiring peripartum hysterectomy in the presence of broad ligament fibroids, it is advisable to deal with the side that is anatomically more accessible first.[59] Every effort should be made to identify the ureters in such women.

Myomectomy at the time of caesarean section

Growing evidence suggests that myomectomy undertaken at the time of caesarean section is safe and cost effective since it avoids possible fibroid removal at a later stage.[40,52,60] Fibroids causing difficulty with closure of the uterine incision, to facilitate safe delivery of the fetus, large fibroids greater than 6 cm in diameter,[61] or visible subserosal fibroids are indications for this procedure.

In a retrospective case–control study,[52] 47 women with fibroids undergoing a myomectomy at the time of caesarean section were compared with a group of 94 women with fibroids who underwent a caesarean section without myomectomy. No significant difference was seen in haemoglobin levels, incidence of blood transfusions or postoperative fever between the groups. However, there were significant differences in mean operating time with myomectomy (an additional 15 minutes) and length of hospital stay (an additional 0.4 days). The most common site for myomectomy was where fibroids were located within the uterine incision, rather than those that were large, intramural, fundal, or found adjacent to the fallopian tubes. The findings of this study are supported by a larger 10-year study in China of 1242 women,[62] and a 2014 study of 65 women, which drew similar conclusions in patients with fibroids greater than 5 cm in diameter.[2] Another study of 76 women with fibroids also found caesarean myomectomy to be feasible in women with subserosal fibroids and those located within the body of the uterus.[63] One concern may be the incomplete removal of multiple fibroids at caesarean myomectomy compared to myomectomy in the non-pregnant state, which leads to a risk of further treatment in future.

If clinically indicated, national guidelines from Canada now support both antenatal myomectomy and caesarean myomectomy.[49]

Another study analysed 51 women for the safety of caesarean hysterectomy for fibroids. The risk of bleeding, drop in haemoglobin levels, postoperative fever length of operation and length of stay, were comparable with caesarean myomectomy.[62]

Postnatal care

The natural history of fibroids postpartum has been extensively researched. Fibroids regress from early pregnancy to 3–6 months postpartum in over 70% of women.[64] While the precise mechanism for fibroid regression remains unclear, mechanical and cellular changes at birth and involution of the uterus are thought to affect fibroids and regression may occur via a hypoxic mechanism.[65]

A prospective study from the USA found that black women were statistically less likely to have regression of fibroids after delivery (adjusted odds ratio [OR] 0.47, 95% confidence interval [CI] 0.25–0.88).[64] Furthermore, women using a progesterone-only contraceptive demonstrated significantly reduced regression of uterine fibroid size (adjusted OR 0.33, 95% CI 0.14–0.79) compared with controls. Compared with women who gave birth to live babies, women with miscarriages are also statistically less likely to have fibroid regression (OR 0.19, 95% CI 0.09–0.39). There is no difference in regression based upon age, parity, body mass index, level of education, income, smoking, size and location of fibroids, mode of delivery, postpartum infection, breastfeeding, or time for the return of menstruation.

Complications of fibroids in the postpartum period are rare, but have been described. Pyomyoma is a life-threatening complication resulting from infarction and infection of fibroids.[66] It can present with abdominal pain, fever and septicaemia with common organisms such as *Clostridium*.[67] Imaging findings tend to be nonspecific. Definite diagnosis and treatment are achieved by laparotomy with either myomectomy or hysterectomy. Computed tomography-guided drainage of pyomyoma is also possible.[68] Rupture of degenerated fibroids in the postpartum period can also arise.[69] Women present with acute abdominal pain, and ultrasound reveals a large hyperechoic mass on the uterine wall and free fluid within the pelvis. Exploratory laparotomy may be required to confirm the diagnosis.

The outcome of pregnancies following a previous caesarean myomectomy has been studied. The spontaneous pregnancy rate is as high as 79.3% following a caesarean myomectomy,[53] in marked contrast to interval myomectomy, which has quoted rates of between 38.6 and 55.9%.[69–71] A study of 29 women showed a mean interpregnancy interval of 31.2 months following caesarean myomectomy; 20.7% required fertility treatment in the form of clomiphene, division of intrauterine adhesions and hydrotubation for distal tubal occlusion.[53] Also highlighted with caesarean myomectomy is the higher risk of placenta praevia, abnormal lie and talipes.[53] These risks, and the inherent danger of bleeding with placenta praevia, should be taken into consideration when evaluating the benefit of avoiding a later interval myomectomy.

Conclusions

Uterine fibroids affect many aspects of pregnancy. They are a significant cause of PPH and can pose challenging surgical problems.

Caesarean myomectomy is a safe procedure. Antepartum myomectomy reduces the risk of peripartum hysterectomy but increases the risk of caesarean section.[16] Further studies are required in populations that resemble the UK demographic, as is the need for greater evaluation of the effect on subsequent pregnancies that follow both caesarean myomectomy and treatment with UPA.

Disclosure of interests

There are no conflicts of interest.

Contribution to authorship

KS was involved in conception, design, acquisition of data, drafting the article and revising it critically for important intellectual content. DA was involved in the design, drafting the article and revising it critically for important intellectual content. Both authors approved the final version.

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