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Case Series

No two uteri are alike: clinical variability and management of uterine fibroids in pregnancy – a case series

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ABSTRACT

Uterine fibroids present with unpredictable clinical behavior during pregnancy depending on their size, number, and anatomical location, as gestational hormonal shifts and altered uteroplacental dynamics influence tumor growth, placentation, and labor mechanics. This prospective case series evaluated four singleton pregnancies (mean maternal age: 29.5 years; 3 primigravidae, 1 multigravida) complicated by subserosal and intramural fibroids ranging from 1.9 to 7.0 cm. One patient exhibited transient second-trimester uterine artery Doppler notch resistance without fetal growth restriction. Intrapartum, three patients required emergency caesarean delivery secondary to failed labor induction or labor dystocia, while one underwent elective caesarean section for cephalopelvic disproportion. Selective caesarean myomectomy was successfully performed in two cases (50%) where fibroids directly obstructed the lower uterine segment incision line. Conversely, myomectomy was intentionally deferred in the remaining two cases due to deep intramural placement or transient intraoperative uterine atony. All four neonates were delivered at term with favorable birth weights (mean: 3.03 kg) and robust Apgar scores, requiring no NICU admissions. Uterine fibroids exhibit marked clinical heterogeneity; however, vigilant antenatal surveillance, selective Doppler application, and individualized intrapartum decision-making performing myomectomy specifically when fibroids impede surgical access ensure optimal maternal and neonatal outcomes

Keywords: Pregnancy, Uterine Leiomyoma, Failed induction of labor, Uterine atony, Caesarean myomectomy

INTRODUCTION

Uterine fibroids (leiomyomas) represent the most common benign smooth muscle neoplasms in women of reproductive age, with an estimated general prevalence of 5-20%.[1,2] They coexist with pregnancy in approximately 1-4% of gestations and present unique clinical and surgical challenges due to their variable and often unpredictable behavior during pregnancy.[2,3] Arising from the smooth muscle cells of the myometrium or uterine vascular wall, fibroids may remain completely asymptomatic throughout gestation or manifest with severe maternal and fetal complications.[4,5]

Hormonal stimulation, primarily mediated by elevated estrogen and progesterone levels, as well as increased uterine vascularity during early pregnancy, can promote rapid fibroid enlargement. Conversely, mechanical factors and focal ischemia may induce red degeneration or tissue necrosis.[2] Depending on their anatomical subtype submucosal, intramural, or subserosal fibroids can interfere with blastocyst implantation, placentation, fetal orientation, and the mechanics of myometrial contractility

during labor.[2,6] Maternal complications include red degeneration, acute torsion, antepartum hemorrhage, fetal malpresentation, labor dystocia, uterine inertia, retained placenta, and postpartum hemorrhage.[2,4]

Large intramural or lower segment leiomyomas may lead to fetopelvic disproportion or cervical dystocia, significantly increasing the rate of operative caesarean deliveries.[1,3] Fetal risks predominantly stem from mechanical uterine distortion and impaired uteroplacental perfusion, leading to intrauterine growth restriction (IUGR), placental abruption, or premature rupture of membranes (PROM).[2,5]

Detection during pregnancy is predominantly ultrasonographic. While small posterior or isoechoic fibroids may be obscured by the gravid uterus, larger lesions are readily identified by their mass effect, altered acoustic attenuation, and peripheral vascularity.[2,3] Standard management remains conservative, centered on serial ultrasound surveillance, symptomatic relief, and expectant obstetric monitoring. Surgical intervention during pregnancy or at delivery remains controversial; however, selective intraoperative procedures, such as caesarean myomectomy, are increasingly recognized as safe and necessary when fibroids obstruct the lower uterine segment incision line.[4,7]

While existing literature largely focuses on isolated complications such as red degeneration or pain management, real-world data regarding the decision-making process for caesarean myomectomy versus conservative management during intrapartum failure to progress remain limited. This case series addresses this clinical gap by detailing the antenatal surveillance, Doppler parameters, intrapartum mechanics, and surgical strategies across four distinct clinical presentations of fibroids in pregnancy, offering actionable insights for practicing obstetricians.

CASE SERIES

Case 1

A 29-year-old primigravida with a spontaneously conceived singleton pregnancy presented to the antenatal clinic for routine evaluation. Her early pregnancy was uneventful, with no significant medical or surgical history. At 14 weeks + 1 days of gestation, a nuchal translucency (NT) scan revealed two subserosal exophytic fibroids located on the right lateral uterine wall, measuring 7 × 6.5 cm and 3.4 × 3 cm.

Uterine artery Doppler evaluation demonstrated an end-diastolic notch (EDN) with an elevated pulsatility index (PI) on the right uterine artery, signalling mild early uteroplacental resistance. Fetal Doppler indices were within normal limits. The patient was asymptomatic and advised close antenatal surveillance.

At 20 weeks, a Targeted Imaging for Fetal Anomalies (TIFAA) scan confirmed normal fetal anatomy and growth. Uterine artery Doppler showed resolution of the notch with a normal mean PI of 1.2, and the patient remained normotensive throughout. Oral glucose tolerance test (OGTT) and thyroid function tests were normal. TIFAA confirmed three subserosal fibroids along the right lateral uterine wall, measuring 6.2 × 6.1 cm, 2.7 × 2.2 cm, and 3.3 × 3.6 cm.

The patient remained asymptomatic until 38 weeks + 2 days, when she presented with premature rupture of membranes (PROM). Labor was induced with misoprostol; however, due to failure to progress secondary to labor dystocia and uterine inertia, an emergency lower-segment caesarean section (LSCS) was performed. Intraoperatively, three subserosal fibroids (6 × 5 cm, 4 × 3 cm, and 3 × 3 cm) were situated directly along the lower uterine segment incision line (Figure 1).

To facilitate fetal extraction and ensure secure uterine closure, a caesarean myomectomy was performed. Hemostasis was achieved using continuous baseball sutures. Total blood loss was within normal limits (~450 ml) with no postpartum hemorrhage.

A healthy male infant weighing 3.18 kg was delivered with normal Apgar scores. The postoperative recovery was uneventful, and she was discharged on postoperative day 5. At her 6-week postpartum follow-up, the patient reported complete symptom recovery with well-healed surgical wounds.

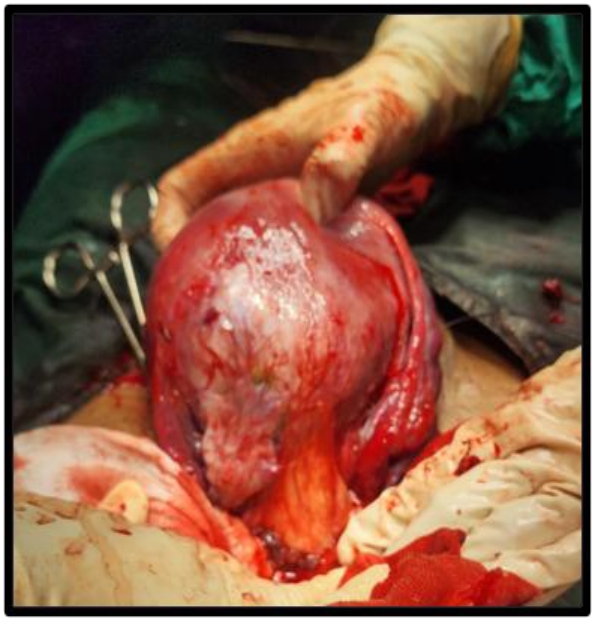

Figure 1: Intraoperative view of the lower uterine segment showing subserosal fibroids along the incision line prior to myomectomy during caesarean section.

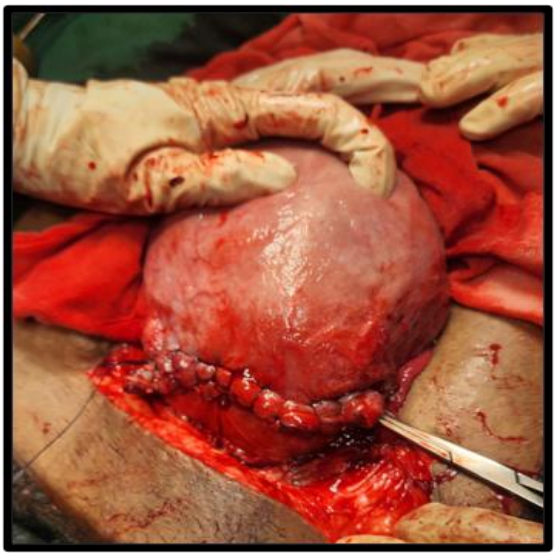

Figure 2: Post-myomectomy uterus with the lower segment incision closed and hemostasis achieved, demonstrating safe removal of fibroids during cesarean delivery.

Case 2

A 32-year-old primigravida with a surgical history of left ovarian cystectomy presented with a spontaneously conceived singleton pregnancy. Early ultrasound (<5 weeks) confirmed a viable intrauterine gestation and revealed a posterior subserosal fibroid measuring 2.4 × 1.6 cm alongside a 2 × 1.5 cm right ovarian corpus luteal cyst. The patient remained asymptomatic, and her 20-week TIFAA scan demonstrated normal fetal growth, normal amniotic fluid volume, and normal placentation with normal OGTT and thyroid parameters.

At 20 weeks, a targeted fetal anomaly (TIFAA) scan demonstrated a normally developing fetus with normal amniotic fluid and placentation. Screening for pregnancy-induced hypertension (PIH) was negative, and routine investigations, including oral glucose tolerance test for gestational diabetes mellitus (GDM) and thyroid function tests, were within normal limits. The previously noted posterior subserosal fibroid and right ovarian cyst persisted, with no additional complications.

At 39 weeks + 3 days, the patient presented with lower abdominal pain and dysuria. Examination revealed term gestation with vertex presentation and 1 cm cervical dilatation with intact membranes. After 5 hours of observation, cervical dilatation reached only 4 cm. Artificial rupture of membranes (AROM) and 50 µg misoprostol were administered for labor augmentation; however, due to non-progression of labor, an emergency LSCS was undertaken. A live male infant weighing 2.68 kg was delivered.

Intraoperatively, four fibroids were identified: two subserosal (5 × 7 cm anteriorly, 3 × 3 cm posteriorly with fatty degeneration) and two intramural (5 × 6 cm upper segment, 4 × 3 cm lower segment) (Figure 3). Following delivery of the placenta, the patient developed intermittent uterine atony with an estimated blood loss of 800 ml. Management included two doses of intramuscular methergine and transfusion of one unit of packed red blood cells (PRBCs), achieving adequate uterine contractility and hemostasis.

Myomectomy was intentionally deferred in view of uterine atony and satisfactory primary hemostasis. The postoperative course was smooth, and both mother and infant were discharged on day 5. At 6 weeks postpartum, ultrasound confirmed steady uterine involution without delayed bleeding.

Figure 3: Intraoperative view of posterior surface of uterus showing
A- intramural right lateral fibroid of 5×6cm size in the upper segment of the uterus.
B- subserosal fibroid of 3×3cm size with fatty degeneration
C- intramural fibroid of 4×3cm size in the lower segment of uterus.

Case 3

A 32-year-old multigravida (G3A2) with a spontaneously conceived singleton pregnancy presented for routine evaluation. Early ultrasound at 8 weeks confirmed gestational age. At 22 weeks + 2 days, a TIFAA scan demonstrated normal fetal growth and morphology with a subserosal fibroid measuring 5.1 × 3.9 cm on the anterior uterine wall, in close proximity to the placenta. Screening for pregnancy-induced hypertension (PIH), thyroid dysfunction, and gestational diabetes mellitus (GDM) was negative at this stage.

At 33 weeks, she was diagnosed with GDM based on an OGTT value of 145 mg/dl, which was successfully managed conservatively via Medical Nutrition Therapy (MNT). At 39 weeks + 2 days, she presented with vague

lower abdominal pain of 1 week duration. Clinical examination revealed cephalopelvic disproportion (CPD). In view of term gestation, GDM on MNT, and CPD, an elective LSCS was scheduled and performed, delivering a healthy male neonate weighing 3.27 kg.

Intraoperatively, an anterior subserosal fibroid measuring 5 × 3.9 cm was located directly in the lower uterine segment operative field. Cesarean myomectomy was performed prior to incision closure, with hemostasis secured using baseball sutures. Operative blood loss was minimal (~350 mL). Postoperative glycemic control was maintained on a normal diet, and both mother and baby were discharged in stable condition on postoperative day 8. At 6 weeks follow-up, maternal fasting blood glucose was normal, and recovery was complete.

Case 4

A 25-year-old primigravida presented with a spontaneously conceived singleton pregnancy. Confirmatory scan at 12 weeks was normal. At 20 weeks, a TIFAA scan identified a small posterior wall intramural fibroid measuring 1.9 × 2.3 × 1.6 cm. Fetal growth, Doppler parameters, and routine laboratory screening (OGTT, thyroid profile) remained entirely normal throughout the antenatal period. At 38 weeks + 4 days, the patient presented with abdominal pain and was admitted for labor induction. Following a failed trial of induction using dinoprostone gel and oxytocin, she was taken up for emergency LSCS.

Intraoperatively, a posterior wall intramural fibroid measuring 2 × 3 cm was confirmed. A male infant weighing 2.99 kg was delivered with robust Apgar scores. Uterine tone was maintained with rectal misoprostol (800 µg total) and oxytocin infusion. Because the fibroid was small, asymptomatic, and located on the posterior intramural wall away from the incision line, myomectomy was deferred. The patient was discharged on day 5, and 6-week follow-up was unremarkable. Table 1 summarizes all of the 4 cases.

Table 1: provides a comprehensive side-by-side comparative summary of antenatal characteristics, intrapartum events, surgical decision-making, and neonatal outcomes across all four cases.

Case ID	Age / parity	Fibroid type and location	Gestational age and doppler	Antenatal complications	Delivery and indication	Intraop findings and myomectomy	Maternal / neonatal outcome
Case 1	29y / G1P0	Right lateral subserosal (x3; largest 7×6.5 cm)	14 wks (Early EDN/raised PI; normalized by 20 wks)	None (Normal OGTT/Thyroid)	Emergency LSCS at 38w+2d (PROM leading to Labor dystocia)	Subserosal fibroids along incision line; Caesarean Myomectomy performed	EBL ~450 mL; No PPH. Neonate: 3.18 kg Male, Apgar 9/10, No NICU
Case 2	32y / G1P0	Posterior & Anterior subserosal + 2 Intramural (total 4; largest 5×7 cm)	<5 wks (Normal Doppler)	Dysuria at term	Emergency LSCS at 39w+3d (Labor non-progression)	Multiple fibroids with Intermittent uterine atony; Myomectomy deferred	EBL ~800 mL; Methergine + 1 PRBC. Neonate: 2.68 kg Male, Apgar 8/10, No NICU
Case 3	32y / G3A2	Anterior subserosal (5.1×3.9 cm) adjacent to placenta	22 wks (Normal Doppler)	GDM (Diet-controlled via MNT)	Elective LSCS at 39w+2d (Cephalopelvic Disproportion)	Anterior fibroid along incision line; Cesarean Myomectomy performed	EBL ~350 mL; Stable post-op. Neonate: 3.27 kg Male, Apgar 9/10, No NICU
Case 4	25y / G1P0	Posterior intramural (1.9×2.3 cm)	20 wks (Normal Doppler)	None	Emergency LSCS at 38w+4d (Failed labor induction)	Posterior intramural fibroid away from field; Myomectomy deferred	Minimal blood loss; Rectal misoprostol. Neonate: 2.99 kg Male, Apgar 9/10, No NICU

Abbreviations: PROM: Premature Rupture of Membranes; LSCS: Lower Segment Caesarean Section; CPD: Cephalopelvic Disproportion; PPH: Postpartum Hemorrhage; PRBC: Packed Red Blood Cells ; EDN: End-Diastolic Notch; PI: Pulsatility Index; GDM: Gestational Diabetes Mellitus; MNT: Medical Nutrition Therapy; OGTT: Oral Glucose Tolerance Test; EBL: Estimated Blood Loss; NICU: Neonatal Intensive Care Unit

DISCUSSION

The physiological interaction between uterine leiomyomas and pregnancy remains highly variable. In our present study, the antenatal course was overall uncomplicated: only one patient (Case 3) developed diet-controlled gestational diabetes mellitus (GDM) and one (Case 1) showed transient uterine artery Doppler notch resistance that resolved by 20 weeks. None of our four patients experienced red degeneration or acute severe pain, contrasting with Amber et al (2025), where 66.7% (2 of 3) presented with red degeneration requiring emergency analgesia. This absence of painful degenerative episodes in our series may be attributed to the predominance of subserosal architecture and stable fibroid sizes during mid-to-late gestation, avoiding the rapid tissue growth, vascular stealing, and focal ischemia that typically trigger hemorrhagic infarction. Additionally, our largest fibroid was 7 × 6.5 cm with minimal growth, whereas a previous study reported massive fibroid growth expanding up to 15 × 12 cm. This contrast highlights how smaller, subserosal tumors are less prone to outgrowing their blood supply compared to massive intramural lesions.[7]

Intrapartum labor dysfunction was a primary outcome in our study, with 75% (3 of 4) requiring emergency caesarean delivery for labor dystocia or failed induction. This closely mirrors a previous study, who had documented a 73.3% caesarean section rate in fibroid-complicated pregnancies.[12] However, our labor induction failure rate (66.7% of induced cases) was notably higher than the previous study, where all laboring patients achieved successful vaginal delivery.[6] The higher induction failure rate in our series may reflect critical differences in anatomical fibroid location particularly lower-segment involvement obstructing engagement unfavorable baseline cervical status, altered local myometrial contractility, or sample size constraints, emphasizing the clinical heterogeneity of labor mechanics in fibroid-complicated gestations. Mechanistically, intramural and large subserosal fibroids disrupt the synchronized propagation of myometrial electromechanical waves required for effective cervical effacement.

Decision framework for caesarean myomectomy

Historically, caesarean myomectomy was strongly discouraged due to catastrophic risks of severe intraoperative hemorrhage, uncontrolled uterine atony, and emergency hysterectomy.[4] However, contemporary surgical evidence supports selective caesarean myomectomy when performed by experienced operators using modern uterotonics and precise hemostatic suturing.[7]

In our series, we applied a strict institutional decision framework- Caesarean myomectomy indications: performed in 50% (2 of 4) of cases (Cases 1 & 3) because subserosal fibroids directly obstructed the lower uterine segment incision line. This aligns with a study, where they successfully performed emergency caesarean myomectomy for a 15 cm×12 cm lower segment fibroid to facilitate delivery and uterine closure.[7] Uterotonics and continuous baseball sutures maintained low blood loss (~350–450 ml) with no postpartum hemorrhage (PPH), confirming the safety of caesarean myomectomy seen in recent studies when fibroids directly impede surgical access.

Deferral Criteria: deferral occurred in 50% of cases (Cases 2 and 4) due to deep posterior intramural location or intraoperative uterine atony. Avoiding myomectomy during uterine atony prevented major hemorrhage, adhering to principles outlined by previous study regarding the high risk of catastrophic bleeding and emergency hysterectomy during unindicated open myomectomy.[4]

Regarding vascular monitoring, Case 1 had early second-trimester uterine artery Doppler notch resistance that normalized by 20 weeks with preserved fetal growth. In contrast, to a previous study which reported intrauterine growth restriction (IUGR) in 13.3% of cases, and a study noted early-onset oligohydramnios.[12] This difference suggests that transient Doppler notches in our series resulted from temporary mechanical vascular compression by the lateral fibroid rather than true global placental insufficiency.

Neonatal outcomes in our study were 100% favourable, with all infants delivered at term (mean birth weight: 3.03 kg), robust Apgar scores, and zero NICU admissions. These outcomes compare favourably to a previous study, which reported 20% preterm birth and 26.6% low birth weight, and one more study observed late preterm deliveries at 35-36 weeks due to acute maternal symptoms.[12,6] Our superior neonatal parameters likely stem from successful conservative antenatal surveillance, effective pain management preventing preterm labor triggers, and timely decision-making for elective or emergency operative intervention before fetal compromise occurred.

Limitations

The primary strength of this study lies in its standardized prospective documentation of intrapartum mechanics, explicit institutional criteria for caesarean myomectomy versus conservative deferral, and detailed maternal-neonatal outcome correlation. However, key limitations include the small sample size (n=4) and single-center nature, which restricts generalizability across broader population cohorts. Furthermore, long-term follow-up evaluating post-myomectomy myometrial scar integrity, recurrence rates, and subsequent reproductive outcomes was not performed, highlighting an essential area for future prospective research.

CONCLUSION

Pregnancies complicated by uterine fibroids exhibit remarkable clinical variability, reinforcing the principle that no two cases behave identically. Management requires tailored antenatal monitoring, selective application of uterine Doppler, and preparedness for intrapartum labor dystocia. Caesarean myomectomy is a safe, effective option when fibroids directly obstruct the lower segment surgical incision line; however, conservative deferral remains essential in deep intramural locations or in the setting of intraoperative uterine atony. With vigilant, individualized care, excellent maternal and neonatal outcomes can be consistently achieved.

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