



Caesarean myomectomy a technically feasible and safe option: A prospective study of 102 cases over period of twenty years

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Abstract

As per the traditional teaching and practice, myomectomy at time of caesarean delivery has traditionally been discouraged and been limited to myomas with a discrete pedicle and that can be clamped and easily ligated [1-3]. The fear of profuse bleeding while dissection of myoma during caesarean section may lead to unnecessary hysterectomy is the main reason of not doing caesarean myomectomy. There are few studies on caesarean myomectomy in the literature with conflicting results, [4-8] however the fresh evidence is in the favour of surgery [9,10]. Advances in imaging, surgical skills and techniques, improved suture materials, blood component support has made many complex surgeries easier. Doing a caesarean myomectomy not only reduce the chances of uterine bleeding due to poor uterine contractility and apposition but also avoids a repeat surgery, anaesthesia, and associated

complications. The present study shares author’s experiences in managing myomas complicating pregnancies, where caesarean myomectomy was done in selective cases during caesarean section for obstetrical indications. The experiences have been encouraging without much of technical difficulty or excessive blood loss even dealing with technically very difficult cervical fibroids. Study concludes that caesarean myomectomy is a safe procedure, very rarely requiring additional interventions and should be offered as an option to antenatal patients with fibroids undergoing caesarean section in tertiary care settings and experienced hands.

Keywords: Caesarean myomectomy, Myomectomy and pregnancy, Myomectomy in gravid uterus

Introduction

Ever since Victor Bonney performed first myomectomy in the year 1913, caesarean myomectomy has remained a controversial surgery [11]. Whenever indicated,

removing a myoma after caesarean section requires another surgery and anesthesia. It has financial implications, added hospital stay, loss of work hours and prolonged morbidity after caesarean till second surgery is undertaken.

With the safety and advances in modern surgical practices, availability of better energy sources, suture materials, blood component support and radiological intervention procedures; surgical approach to various conditions namely caesarean myomectomy has seen a shift from conventional nonintervention to active intervention. Laparoscopic and robotic surgery too has avoided many laparotomies for a range of procedures. Many caesarean myomectomies have been performed uneventfully 'off the record' due to lack of clear-cut guidelines for the fear of litigation. A caesarean myomectomy avoids the need for repeat surgery and anesthesia, additional hospital stays, prolonged suffering without adding to hospital bills. Authors are experienced surgeons working at tertiary care hospitals and have been performing caesarean myomectomies routinely over a period of 20 years. In this prospective study authors share their experience of 102 cases of caesarean myomectomies over a period of 20 years performed mostly by a single surgeon. Study concludes that CM is a safe procedure, very rarely requiring additional interventions and should be offered as an option to antenatal patients with fibroids undergoing caesarean section in advanced care settings and experienced hands.

Aim and Objective

- The aim of the study is to explore the technical feasibility and safety of caesarean myomectomy and its effect on gravid uterus in term of intra operative blood loss, operating time and postoperative morbidity.

- Formulation of strategy in dealing with fibroids in gravid uterus during caesarean section.

Material and Methods

The present multicentric study was conducted from Mar 2003 to Mar 2022 in various Zonal and Tertiary care teaching Hospitals in Southern, Western and Eastern part of India. Patients with symptomatic fibroids complicating pregnancy either diagnosed prior to pregnancy or during pregnancy who underwent caesarean myomectomy were included in the study. Myomectomy was also done for patients with sub serosal pedunculated fibroids however these cases were excluded from the study.

Inclusion Criteria

- Patient with symptomatic fibroid complicating pregnancy who underwent caesarean myomectomy
- Asymptomatic fibroid in pregnancy with back pressure changes on urinary system.
- Patients desiring caesarean myomectomy

Exclusion Criteria

- Sub serosal pedunculated fibroids
- Patients with blood coagulation disorders
- Patients with cardio-pulmonary, liver, renal or hypertensive disorder.
- Patients with moderate to severe anemia
- Complicated diabetes mellitus with end organ damage
- Patients with fibroids who deliver vaginally
- Ante partum hemorrhage

All cases of pregnancy with fibroids were booked cases at a tertiary care or zonal level hospital on regular antenatal follow up. Route of delivery was decided on the basis of obstetrical indications and location of fibroids. Elective caesarean sections were planned at or near 39 weeks of gestation. Emergency caesarean section was done for obstetrical indications during labor like fetal

distress or dystocia and when a patient planned for elective procedure went into spontaneous labor prior to planned surgery. Pre-anesthesia evaluation was done in all cases, which include hematological and biochemical tests. Blood bank support confirmed for component therapy. Informed consent for the caesarean section, Caesarean myomectomy and rare possibility of hysterectomy was taken from all cases.

Surgery was done under spinal anesthesia in most of the cases. Whenever possible, a lower segment caesarean section is performed first. Except when fibroid is near the caesarean incision, uterus is closed with delayed absorbable sutures and followed by myomectomy. Oxytocin bolus (5 Units diluted) or Injection Methylergometrine 0.2mg im/iv was given and oxytocin infusion was started after delivery of baby. During myomectomy the principal of identification of correct plane of dissection, quick in and quick out were followed. Electrocautery was also used for making the myomectomy incision. When possible, it was tried to remove the myomas through same incision. The dead space was obliterated with delayed absorbable sutures and serosa sutured.

Time taken for myomectomy, operating blood loss from myoma bed and technical difficulty if any were recorded in each case. All specimen removed were sent for histopathological examination. Hb and PCV were done at 24 hours and 48 hours post operatively. The patients were monitored for postpartum haemorrhage, postoperative morbidity in terms of pyrexia, hospital stay. Blood transfusion was considered where indicated. All results were computed and analyzed to draw conclusion.

Observations

Total of 102-booked antenatal cases of pregnancy complicated by fibroid were included in the study after

applying inclusion and exclusion criteria. Sixty-four patients had fibroid diagnosed prior to conception and 38 had the first-time diagnosis of fibroid during the pregnancy. In patients who conceived with fibroid, abnormal uterine bleeding was the commonest preconceptional symptom (52 out of 64, 81%), however pain and lower abdominal discomfort was the chief complaint in patients where fibroid was diagnosed during pregnancy (32 out of 38, 84%). Asymptomatic cervical fibroid with backpressure changes over urinary system were encountered in three cases. The average maternal age was 29 years with majority of the women presenting in the age group of 26 to 30 years. The average BMI was 24.3 Kg/m² and the mean period of gestation at the time of surgery was 38 weeks and 02 days. The demographic details of the study population have been tabulated in Table 1.

Among study population of 102 cases, 29 were primipara and 73 were multipara. Thirty-eight patients had post caesarean section status and one patient had undergone myomectomy two years prior to conception. Impaired blood sugar or uncomplicated gestational diabetes mellitus was present in 12 participants. Mild to moderate gestational hypertension was present in 06 cases. Fetal malpresentations were present in 19 cases with breech being the commonest. IHCP and prurigo of pregnancy were present in two cases. The obstetrical characteristics of the study population have been tabulated in table 2.

In cases of fibroid complicating pregnancy, where there was no contraindication to vaginal delivery, were given trial of vaginal delivery. Those patients who had vaginal delivery were excluded from the study. However, caesarean myomectomy was done for the patients who required emergency caesarean for obstetrical indication. Total of 23 patients with fibroid complicating the pregnancy underwent emergency caesarean section and

myomectomy. Twelve patients who were planned for elective caesarean section required emergency surgery as they went into spontaneous labor prior to planned surgery. Elective caesarean section and myomectomy was done in 67 cases. Lower segment caesarean section was possible in almost all the cases with few modifications except one, which required classical caesarean section. Mean gestational age at the time of surgery was 38 weeks 2 days. The average preoperative hemoglobin was 10.8 gm% and the average neonatal birth weight was 3.1 Kg. the operative characteristics of the study population have been tabulated in Table 3.

In all the 102 cases, baby was delivered before proceeding for myomectomy. Remaining and reaching the correct plane for myomectomy with quick in and quick out surgical technique was followed. The average operative time for caesarean section and myomectomy was 50 min. A solitary fibroid was present in 67 cases. Nineteen cases had two to three numbers of fibroids, 09 cases had four to five numbers of fibroids and seven cases had more than five fibroids. Maximum number of fibroids removed in a case was eighteen.

In 58 cases fibroid was present in the upper segment and in 9 cases there was a solitary lower segment fibroid. Thirty-five cases had multiple fibroids at various locations. Majority of the fibroids were intramural or mixed variety. Myomectomy for sub serosal pedunculated fibroid was performed on seven cases however these cases were not included in the study. Seventy-four fibroids were up to 5 cm in size, fifty-three fibroids were between 6 to 10 cm in size and fifty-eight fibroids were between 11 to 15 cm in size. The characteristics of the fibroids have been tabulated in Table 4.

Nearly all cases of caesarean myomectomy could be performed without much technical difficulty following

the basic surgical principals. The mean operative blood loss for both caesarean section and myomectomy was 630 ml. Total operative blood loss was less than 500 ml in 62 cases and between 500 ml to 1000 ml in 39 cases. In one case with multiple fibroids approximate blood loss was 1200 ml. Two units of packed RBC were transfused to this patient in the immediate post operative period. Blood loss of more than 1000 ml was considered as post-partum hemorrhage.

There were no major surgical complications or injury to other pelvic structures. There was no need for internal iliac vessel ligation or peripartum hysterectomy. Five cases had fever in the immediate post operative period which was probably attributed to misoprostol application. One patient had superficial wound infection, which was managed with antiseptic dressing and antibiotics. Average hospital stay was three days. None of the patient presented back with any complication related to surgery. The details of operative blood loss and surgical morbidity have been tabulated in Table 5 and Figure 1.

Discussion

Myomas are commonest benign tumors of monoclonal smooth muscle origin. The incidence of myoma complicating pregnancy is around 0.2 -1.4 % of all pregnancy [12].

The prevalence of myomas increase with age of lady. Changed lifestyle, socio-economical-cultural factors have caused a delay in the marriage and childbearing age. Higher number of pregnancies is now diagnosed to be complicated with myomas. Further, advances and wider availability of ultrasonography has further resulted in detection of more fibroids during pregnancy. Fibroid in gravid uterus can cause various complications during antenatal, intra partum as well as postpartum period. Effects of myoma on pregnancy depend on size, location, and numbers of fibroids. Myoma size greater than 3 cm

has increase rate of preterm labor, placenta abruption and caesarean delivery [13]. A lady may conceive with a known fibroid, or it can be detected during pregnancy or at the time of caesarean section. Present study included symptomatic fibroids complicating pregnancy, which have been diagnosed before or during pregnancy. Even small intramural fibroid can cause in coordinate uterine contraction and increase incidence of caesarean delivery [14]. The incidences of life-threatening post-partum hemorrhage in gravid uterus with fibroid, which can only be corrected by hysterectomy, have been documented [15].

Keeping all the possible complication during antenatal, intrapartum and post-partum period, it is noteworthy to undertake caesarean myomectomy which is not only technically feasible also safe for the patient and may avoid future major gynecological and obstetrical complications [16]. Conventionally, myomectomy is not recommended during cesarean section as there is risk of complications, especially the excessive hemorrhage which may require an emergency hysterectomy [17-19]. Advances in imaging, surgical skills and techniques, blood component support has made many complex surgeries easier. Doing a caesarean myomectomy not only reduce the chances of uterine bleeding due to poor uterine contractility and apposition but also avoids a repeat surgery, anaesthesia and procedure associated complications.

Points in favor of caesarean myomectomy

➤ Fibroids may increase in size during pregnancy. However, the increase in the size of myoma is much less when compared to increase in the size of uterus from pre-pregnancy or non-gravid state to term due to hyperplasia of myometrial cells. This differential growth of myoma and uterus make the false capsule

more distinct and laxer thereby making intracapsular removal easier.

- High vascularity of gravid uterus helps in better healing and remodeling
- Gravid uterus has different hemostatic mechanisms where alignment of myometrial cells helps in occlusion of vessels acting as living ligatures. These myometrial cells are highly sensitive to oxytocin, Methylergometrine and Prostaglandins in gravid state. These additional mechanisms have very effective hemostatic effect even in patients with coagulation disorders. Compared to the normal uterus myometrium, there is decreased blood flow rate in uterine fibroids and adjacent normal myometrium, which may decrease the distribution of oxytocin. The low distribution of oxytocin may result in uterine atony during cesarean [20].
- The relative size of uterine incision needed to remove a myoma is much smaller in gravid uterus when compared to non-gravid state due to exponential increase in uterine size in pregnancy. The physiological involution process further helps in remodeling of myomectomy scar and uterine shape.
- There is better involution of uterus following myomectomy.
- Uterus has better contractility and therefore less bleeding
- Surgical approach is easier as gravid uterus brings the fibroid near to the site of abdominal incision.

In recent years, many studies indicated that myomectomy during cesarean delivery was safe and feasible [21-23]. In the present study majority of 102 myomectomies have been done by a single surgeon over a period of twenty year at well-equipped Centres. Author is an experienced Surgeon with over 30 years of experience. There was no need to resort to hysterectomy in any case and blood

transfusion was required only in one case. The study is comparable to study by Y. Simsek, et al. in terms of perioperative blood loss and need for blood transfusion who reported no significant increase of bleeding risk and frequency of blood transfusion between the patients underwent caesarean myomectomy or caesarean section alone [24].

In present study five patients had fever in the immediate post-operative period which was probably due to effect of misoprostol application for uterine contractility. The average hospital stay was three days which was comparable to that of post caesarean delivery. The post-operative morbidity in terms of fever, hospital stay is comparable to study by Topcu et al who concluded that outcome variables like frequency of postoperative fever and mean duration of hospital stay had no significant difference between the cesarean myomectomy group and cesarean group [25].

Dedes I et al. reported that a larger size of fibroid (≥ 5 cm) and a maternal age more than 40 years are risk factors of increased blood loss in women with uterine fibroids during cesarean [22], however no such association was noted in the present study [26].

Several studies have described techniques, which can minimize blood loss at cesarean myomectomy, including uterine tourniquet, bilateral uterine artery ligation, and electro cautery, although we have used electro cautery in our study, to reduce blood loss [27,28]. The safety profile of caesarean myomectomy as observed in this study is further supported by a recent systematic review and

meta-analysis of 17 studies and 4702 caesarean myomectomies by Manu Goyal, Ayman et al[29]. Authors concluded that caesarean myomectomy is associated with clinical insignificant increase in operative time, blood loss and hospital stay, should be preferred over CS alone especially by experienced surgeons with appropriate haemostatic techniques and tertiary care centres.

Conclusion

So caesarean myomectomy is a safe and technically feasible option if it is done with patience, skill and observing meticulously all the safety precautions of any other pelvic surgeries in gravid condition. Caesarean section may be seen as an opportunity to address the fibroid. Author recommends that Caesarean section and delivery of the baby should be performed first before proceeding for myomectomy. Whenever possible lower segment caesarean section should be performed. Electrocautery or another energy sources may be used meticulously for hemostasis. Identification of correct surgical plane and enucleation of myoma with blunt finger dissection decreases the blood loss. Whenever possible, adjacent fibroids should be removed by single incision and obliteration of dead space to arrest the bleeding. A quick in and quick out technique should be followed. Role of training for such surgery for young surgeon is also most important to make it a routine practice. Therefore, Caesarean myomectomy should be offered to selected patients in well-equipped centers in an experienced hand with expertise.

Legend Tables and Figures

Table 1: Demography

Demographic Details		
Sn.	Characteristic	Value
1	Average maternal age (years)	28.9
2	Age group (Years)	
	• 21-25	22
	• 26-30	66
	• 31-35	10
	• >35	04
3	Average BMI (Kg/m ²)	24.3
4	Mean period of gestation at time of myomectomy (in weeks)	38.2
5	Booked case	102

Table 2: Obstetric characteristics

Obstetrical Characteristics			
Sn.	Characteristic		Value
1	Gravidity/ Parity	• Primipapa	29
		• Multipara	73
2	Pregnancy associated complications	• Post LSCS pregnancy with fibroid	38
		• GDM/DM	12
		• Post myomectomy pregnancy with fibroid	01
		• Malpresentation	19
		• IHCP	02
		• Gestational Hypertension	6

Table 3: Operative details

Operative Details		
Sn.	Characteristic	Value
1	Mean period of gestation at time of CS (weeks)	38.2
2	Average hemoglobin (pre-operative) gm%	10.8
3	Caesarean delivery	
	• Emergency (for obstetrical indications)	35
	• Elective/ scheduled CS	67
	• Classical	01
4	Average neonatal birth weight (Kg)	3.1

5	Average Operative time	50 min
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Table 4: Fibroid Characteristics

Characteristic of Fibroids		
Sn.	Characteristic	Value
1	Number of Fibroids	
	• Solitary	67
	• Two to three	19
	• Four to five	9
	• More than five	7
2	Location of Fibroid	
	Solitary Upper Segment	58
	• Solitary Fundal /cornual	12
	• Solitary Anterior/ anterolateral	28
	• Solitary Posterior/ posterolateral	18
	Solitary Lower segment	9
	• Cervical	9
	• Broad ligament (not included in study)	3
	Multiple locations	35
4	Type of Fibroid	
	• Sub-serosal (not included in study)	7
	• Intra myometrial	66
	• Sub mucosal	Nil
	• Mixed variety	140
5	Size (diameter) of the fibroid	
	• Up to 5 cm	74
	• 6 to 10 cm	53
	• 11 to 15 cm	58
	• > 15 cm	21

Table 5: Operative characteristics

Blood loss and post-operative morbidity		
Sn.	Characteristic	Value
1	Mean blood loss (in ml)	630
2	Blood transfusion	01
3	Intra-operative blood loss	

	<ul style="list-style-type: none"> < 500 ml 	62
	<ul style="list-style-type: none"> > 500 ml but < 1000 ml 	39
	<ul style="list-style-type: none"> > 1000ml (described as PPH) 	01
4	Operative complications (like injury to ureter, bladder, or great vessels)	Nil
5	Internal Iliac artery ligation	Nil
6	Peripartum hysterectomy	Nil
7	Post-operative fever	5
8	Average Hospital Stay (days)	3
9	Early post-operative complication (<15 post op day)	01(superficial wound infection)
10	Late post-operative complications (> 15 days to six months)	Nil

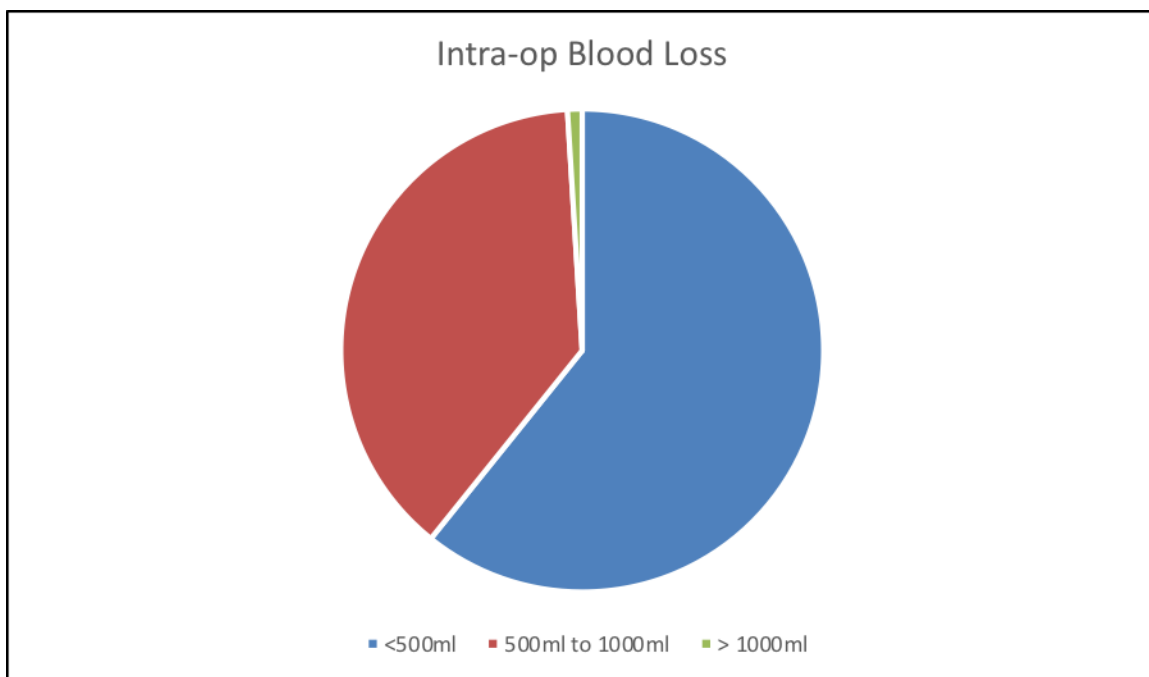


Figure 1

Representative index cases of myomectomy in gravid uterus at various locations

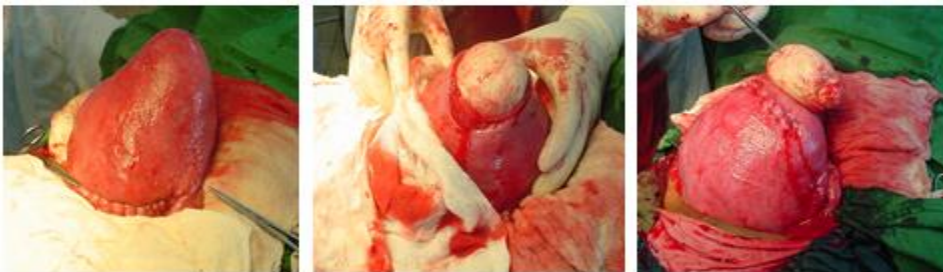


Fig 2: Caeserean Myomectomy (CM) of Fundal Fibroid



Fig 3. CM of large Cervical Fibroid after Classical Section



Fig 4: Cervical /broad lig. Fibroid after LSCS

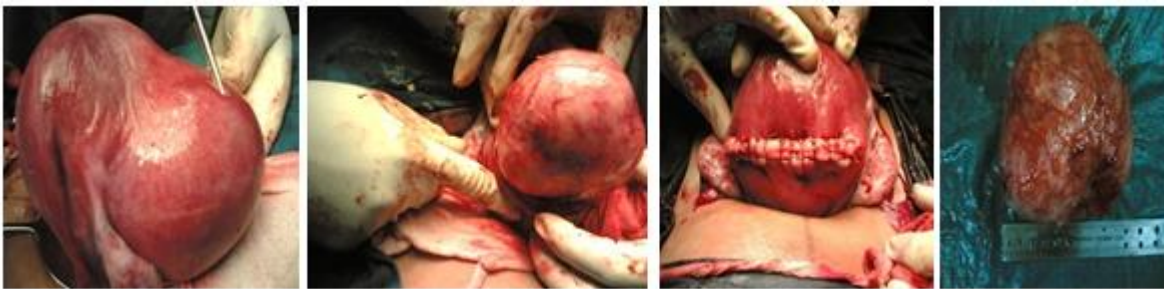


Fig 5: A large Posterior Wall Intramural-Subserous Fibroid



Fig 6: Multiple fibroid (08 myoma) of various size through 3 incisions.



Fig 7: A lower segment Posterior wall intramural-subdecidual fibroid addressed through LSCS Incision.



Fig 8: Caeserean Myomectomy of fundo-anterior fibroid



Fig 9: Twin Anterior, lateral Intramural Myomas

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