CASE REPORTS

ACUTE COMPLICATIONS OF LEIOMYOMA DURING PREGNANCY: REPORT OF THREE (3) CASES THAT REQUIRED ANTEPARTUM MYOMECTOMY

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Abstract

Introduction: Some women with uterine leiomyoma can experience life threatening complications during pregnancy. These leiomyomas are usually large and their associated symptoms were either neglected before the onset of the pregnancy or surgical treatment may have been rejected earlier by the patient.

Case Presentation: Three cases of antepartum myomectomy are reported in this paper. They had severe abdominal pains not responding to medical treatment with gross abdominal distention. Additionally, they had severe life-threatening symptoms including right hypochondria pain and shallow breath in case no.2 and intestinal obstruction in case no.3, an acute surgical complication which could not be resolved by conservative management. All three patients had successful antepartum myomectomy using a new flap techinique not previously described in the literature on reported cases of myomectomy during pregnancy. All the patients recovered successfully from the operation and their pregnancies continued to delivery of their babies at term by caesarean section. Cases no.1 and 2 presented in this report were managed in health facilities in Tamale, Northern Region in 2019. Case no.3 was managed in Accra at the Greater Accra Regional Hospital in 2022.

Conclusion: Pregnant women may present with life threatening complications of leiomyomas, antepartum myomectomy can be considered and successfully performed to improve quality of life or prevent maternal mortality. The procedure for the myomectomy in such situation may not be routine but a special approach is required to avoid fatal complications for both mother and foetus.

Keywords: *Myomectomy, Myomectomy during pregnancy, Caesarean myomectomy, Antepartum Myomectomy, Antenatal myomectomy*

Introduction

Leiomyomas are benign tumours of muscles cell origin containing varying amount of fibrous tissue believed to have resulted from degeneration of some of the smooth muscle cells and are the most common tumours found in the female pelvis[1]. Leiomyomas usually develop and are more symptomatic during the reproductive ages. Leiomyoma nodules contain collagen, fibronectin and proteoglycan which are surrounded by pseudocapsule of compressed areolar tissue and smooth muscle cells with very few blood and lymphatic vessels[1,2]. Some subserosal leiomyoma nodules and parasitic leiomyomas usually develop additional sources of blood supply independent of the uterus from the omentum[1,3], small and large bowels, appendix and the parietal peritoneum as they grow bigger and maintain contact with these structures. The prevalence of uterine leiomyomas in pregnancy was found to be 12.3-16.7% by studies done in West Africa[4,5]. The leiomyoma can be solitary or multiple nodules of various sizes from microscopic to term pregnancy size[3] distention of the abdomen with visible nodules distorting shape of the abdomen. The complications that occur are usually symptomatic in the leiomyoma nodules that are affected.

During pregnancy, anastomosis is established between extrauterine sources of blood supply to the leiomyoma such as the omentum in figure I, visceral organs and parietal peritoneum and the uterine, tubal and ovarian blood vessels of the gravid uterus. With advancing gestational age, the uterus hypertrophies with corresponding enlargement of the blood vessels thereby increasing the blood flow through these new blood vessels supplying the leiomyoma. Sometimes there are visible enlarged blood vessels just beneath the serosa layer without penetrating the leiomyoma nodule. Majority of leiomyomas (97.4%) in pregnant women are asymptomatic[6]. They are usually discovered during routine antenatal obstetric ultrasound scan examination. Due to high levels of estrogen and progesterone leiomyomas can grow rapidly during pregnancy with advancing gestational age resulting in red degeneration from infarction and hemorrhage[1,2,3]. These changes during pregnancy are manifested by pain which could be very agonizing and unresponsive to pain medications. Other acute complications such as discomforting

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abdominal distension, respiratory embarrassment, constipation, early satiety and bowel obstruction are due mechanical obstruction by the leiomyoma due to its large size and rapid growth. Gradually symptoms of compression of intra-abdominal organs as the pregnancy advances beyond the first trimester develop.

The majority of the complications of uterine leiomyoma during pregnancy can be successfully managed conservatively without the need for myomectomy during the pregnancy[6]. Acute life-threatening complications of leiomyomas during pregnancy are due to neglect or refusal of surgical treatment in pursuit of non-surgical treatment provided by herbalist and spiritualist before onset of pregnancy. These non-surgical treatments increase morbidity such as anaemia, deep vein thrombosis, urinary retention, constipation etc. with possibility of mortality. Other forms of degenerative changes such as fatty, hyaline, cystic, calcification, and sarcomatous changes also occur during pregnancy though not as common as red degeneration[1,2,3]. Complications specific to pregnancy co-existing with leiomyoma includes malpresentation, obstructed labour, increased risk of caesarean delivery, Postpartum haemorrhage and peripartum hysterectomy[6].

Cases Presentation

Settings

Cases no.1 and 2 in this report were managed in health facilities in Tamale, Northern Region in 2019. Case no.3 was managed in Accra at the Greater Accra Regional Hospital in 2022.

Presurgical Preparations

Once the laparotomy decision is taken, the necessary informed consent procedures are undertaken. Importantly patients are made to consent for blood transfusion and hysterotomy if that becomes necessary. The indications for hysterotomy includes severe or uncontrollable haemorrhage, accidental rupture of the membranes and abruoptio placentae or any other complications requiring use of uterotonics to control any severe haemorrhage from the uterus. Uterotonics can only be effectively used to control haemorrhage effectively only if the uterus is empty. At least three units of whole blood and 2-4 units of fresh frozen plasma for transfusion must be available in the theatre before the start of the operation.

Surgical Procedure

1. The laparotomy incision should be mesogastric midline incision extended towards xiphisternum or symphysis pubis if necessary for exteriorization of large leiomyomas from the abdomen.
2. Anaesthesia type must allow for extension of the incision towards the xiphisternum.
3. Application of tourniquet at the level of internal cervical os should be avoided due to ongoing intrauterine pregnancy so as not to asphyxiate foetus into demise.
4. Ten to twelve large and medium size artery forceps needed for application on the blood vessels supplying the leiomyoma since tourniquet cannot be used.
5. When the abdomen is entered, identify and apply artery forceps or clamps to all extrauterine blood supplies to the leiomyoma as shown in figures 2 and 4, cut and suture with vicryl no. 2 to ligate all extrauterine blood supplies to the leiomyoma.
6. Big blood vessels of uterine origin to the leiomyoma which are visible under the serosa of the affected leiomyoma nodules may also be ligated just beneath the level where the circular incision on the leiomyoma would be made after exteriorization of the leiomyoma as in figure 3. Big artery forceps should be used in addition to secure any bleeding vessels after incisions are made on the leiomyoma.
7. Packing with abdominal towels of the bowels and omentum should be done. The gravid uterus should not be exteriorized. There should be minimal handling of the gravid uterus to minimize risk of loss of the pregnancy.
8. Aim to remove only symptomatic leiomyomas causing the complications during the surgical operation so as not to disturb the pregnancy.

Serosa and pseudocapsule flap technique

1. Make a circular incision on the leiomyoma to create a flap from the serosa and pseudocapsule at a level 3 to 5cm form the base of the pedicle of the leiomyoma as shown in figure 5.
2. Make circular incision from the junction of the uterine muscles and the serosa covering a subserosal leiomyoma as shown in figure 8.
3. Excision of the complicated leiomyoma nodule is done at the level of the circular incision as shown in Figures 6-8 sparing the serosa and pseudocapsule.
4. Portions of the leiomyoma are excised piece meal beneath the circular incision sparing the serosa and pseudocapsule for use as flap for the closure as in figure 9.
5. The incision is closed using vicryl no.1 and 2 interrupted and continuous suturing as may be needed as shown in figures 10-14. The flap in figure 9 provides enough serosa and pseudocapsule to close the incision without having to suture through the myometrium.
6. Hemostasis is completely secured and any redundant portion of the serosa and pseudocapsule may be trimmed off and the repaired areas left as in figures 10-14.
7. The upper abdomen is then washed with normal saline and an abdominal drain left in place through the mesogastric midline incision to monitor for haemorrhage post-operatively. The incision is closed with nylon no.2 continues suturing for the fascia layer and nylon no.0 or 2-0 interrupted

suturing for the skin. The scar of the incision and site of the drain shown in figure 15.

Figure 1*: Extrauterine blood supply to leiomyoma*

Figure 2: *Artery forceps on extrauterine vessels.*

Figure 3*: ligation of uterine vessels beneath the serosa or use artery forceps.*

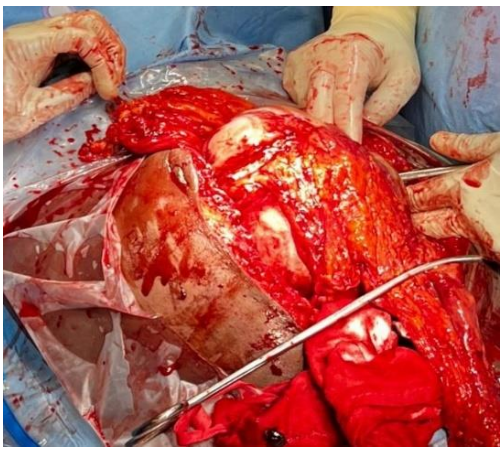

Figure 4*: uterus of case no.3 showing complicated leiomyoma with dilated blood vessels of the omentum and other sources of extrauterine blood supply.*

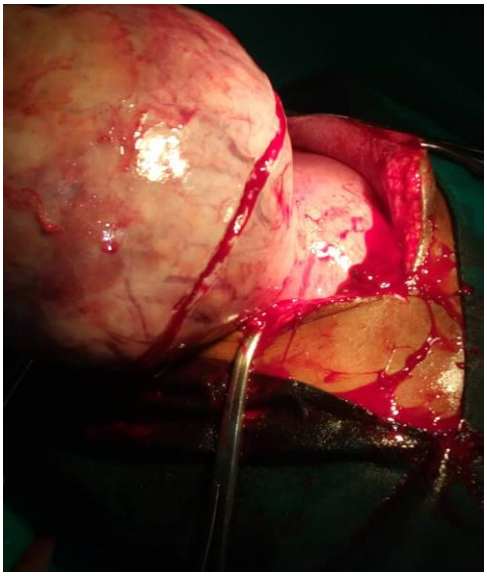

Figure 5*: Showing the circular incision on the serosa and pseudocapsule of the leiomyoma in case no.2.*

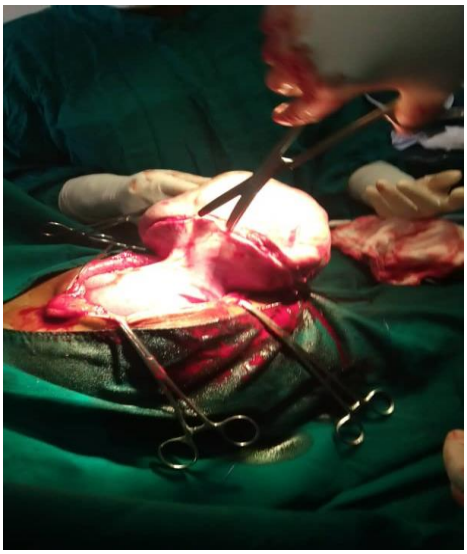

Figure 6*: Developing serosa and pseudocapsule flap 3-5cm from base of the pedunculated leiomyoma in case no.2.*

Figure 7*: Uterus of case no.3 showing complicated leiomyoma excised after circular incision was made on it.*

Figure 8*: Developing serosa and pseudocapsule flap in a subserosal leiomyoma.*

Figure 9*: Lateral view of serosa and pseudocapsule flap in a subserosal leiomyoma.*

Figures 10*: The repair on the posterior part of the gravid uterus in case no.1*

Figure 11*: Shows the repair area on anterior in case no.2. Smaller leiomyomas were left during the myomectomy since they were not symptomatic.*

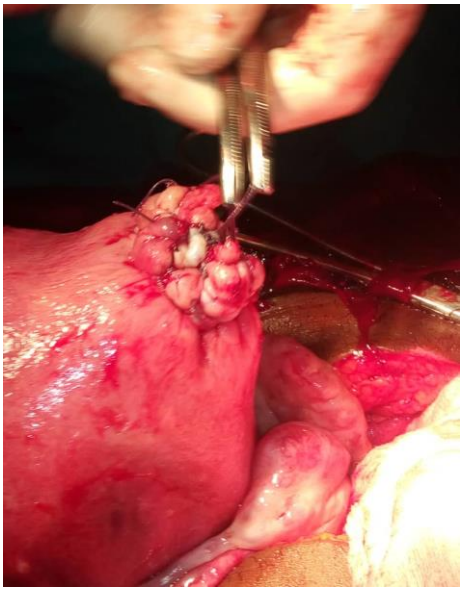

Figure 12*: Repaired uterus using the flap.*

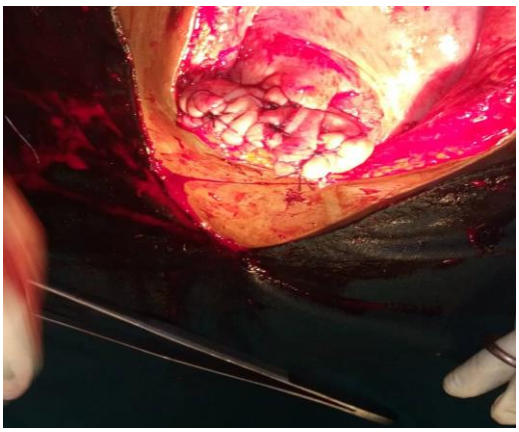

Figure 13*: The repaired area on anterior part of the gravid uterus in case no.2 showing a more prominent stump of the flap in view.*

Figure 14*: Showing the large leiomyoma nodule with smaller parts of it excised piece meal below the circular incision from case no.3.*

Figure 15*: showing scar of the mesogastric midline incision and site of abdominal drain through the incision.*

Case no.1

The first case was a 38-year-old G1P0 who presented at 13 weeks gestation complaining of severe abdominal pains which was unresponsive to pain management. She also had early satiety and insomnia. She knew she had uterine leiomyoma before the onset of the pregnancy but was unwilling to have surgical operation. She expressed her unwillingness to continue with the pregnancy due to the severe pains.

Examination showed a young woman who was in agonizing pain. She was anxious but not pale or jaundiced. Her pulse rate was 106 beats per min and regular with Blood Pressure of 130/90mmHg, with normal heart sounds present. Respiratory rate was 18 cycles per min with adequate air entry and breath sounds. She had a term size abdominal mass which was globular, markedly tender to palpation with no palpable fetal poles. Ultrasound scan reports: Confirmed a viable normal ongoing intrauterine pregnancy at 13 weeks. A fundal uterine leiomyoma 20cmx22cmx18cm was noticed. The liver, spleen, both kidneys and other abdominal organs were normal. There was no ascites or free fluid in the pouch of Douglas.

A diagnosis of degenerating uterine leiomyomas in pregnancy was made. Patient was given im Pethidine 100mg 8hrly for 24hrs each time she was admitted to hospital but unable to stay out of hospital on oral tramadol 100mg 12hourly but was unable to bear the pain without medications beyond 48hrs. Pre-operative investigations and preparations were done and laparotomy was performed after unsuccessful conservative management for two weeks. Findings at laparotomy was large pedunculated leiomyoma about 30cm x 30cm x 25cm, with pedicle about 6cm wide on posterior fundal part of the uterus. The gravid uterus was about 16 weeks size. There were normal tubes and ovaries. The estimated blood loss was 300mls.

She did not receive any blood transfusion, the abdominal drain collected less than 200mls of blood in 72 hours. She remained stable on antibiotics, analgesics and tocolytics and was discharged on the fifth post-operative days on haematinics and antibiotics. Her antenatal care continued without any complications and an elective caesarean section at 38 weeks was performed with delivery of a normal life baby.

Case no. 2

Case 2 was a 27-year-old G1P0 who presented at 24 weeks gestation complaining of severe abdominal pains which is unresponsive to pain management at other health facilities. She also had discomforting abdominal distention, early satiety, insomnia, right hypochondria pain and compression with painful breathing. She was unwilling for surgical treatment for uterine leiomyoma before the onset of the pregnancy because she was afraid of the surgery. She used over the counter pain killers and herbal medications as treatment for the leiomyoma before onset the pregnancy. She wanted to have the operation this time as a way of relieving the pain she was

experiencing. Examination showed a young woman who was in severe pains. she was not pale or jaundiced. The pulse rate was 100 beats per min regular, blood Pressure was 118/87mmHg, normal heart sounds with no murmurs. The respiratory rate was 20 cycles per min with adequate air entry bilaterally. The abdomen was asymmetrically enlarged, term size with palpable very tender mass in the upper abdomen to the right. The gravid uterus was palpable rising above the level of the umbilicus. The fetal heart rate was 148 beats per minute and regular. The liver, spleen and both kidneys not palpable.

Ultrasound scan confirmed a viable normal ongoing intrauterine pregnancy at 24 weeks. A fundal uterine leiomyoma nodule 20cm x 18cm x 16cm was noticed coexisting with smaller uterine leiomyoma nodules. There was no free fluid in the pouch of Douglas. She was diagnosed of degenerating uterine leiomyomas in pregnancy. The patient was given im Pethidine 100mg 8hrly for 24hrs on three occasions that she was admitted within two weeks and often discharged home on Tablets morphine 10mg every four hours in 24 hours when necessary. She was unable to do without treatment for a single day. The necessary pre-operative investigations and preparations were done and laparotomy was performed.

The findings at laparotomy: huge pedunculated leiomyoma about 20cm x 20cm x 20cm, with pedicle about 7cm, right lateral anterior-fudal part of the uterus with level of attachments of the round ligaments. Gravid uterus about 24 weeks size. There were normal tubes and ovaries. The estimated blood loss was 200mls. Abdominal drain collected about 100mls of blood in 72 hours. She remained stable antibiotics, analgesics and tocolytics and was discharged on the fifth post-operative day on haematinics and antibiotics. Her antenatal care continued without any complications and had a caesarean section at 38weeks with delivery of a normal life baby. There were adhesions noticed between anterior abdominal wall and the uterus.

Case No. 3

A 35-year-old JS G3P0 with 2 spontanoues miscarriages presented at GARH as referral from one of the district hospitals in the Greater Accra Region at 21weeks 4days with 3 weeks history of severe abdominal pain and gross distention of the abdomen. She had loss of apepite, early satiety, vommitting and constipation. She also had headaches, dizziness, palpitations, burning sensation in the chest with interminent pains and insomia. Conservative treatment in many health facilities have been unsuccessful. She was middle aged woman, maderately pale but not jaundiced; she looked worried, dehydrated, afebrile and chronically ill. She had lost weight and had mild pitting pedal oedema. The pulse rate was 96 min regular and thread with Blood Pressure of 113/68mmHg, normal heart sounds with no murmurs. The respiratory rate was 20 cycles per min, with SPO2 98% on room air. The chest had adequate air entry and breath sounds. The abdomen was asymmetrically enlarged with palpable tender mass in the upper abdomen. The gravid uterus could be palpated rising above the level of the umbilicus with no distinguishable fundus due to tenderness. The fetal heart rate was 167 beats per minute and regular. She had renal angle tenderness bilaterally. There were no signs of ascites. Bowel sounds were present but reduced. She had a normal vulvar with no discharge or bleeding from the vagina.

She had an obstetric and abdominal ultrasound scan report which showed single intrauterine viable pregnancy at 21weeks. The placenta was low lying with adequate liquor volume. There were multiple intrauterine leiomyomas with largest at the fundus of the uterus measuring more than 25cmx20cmx 20cm. There was bilateral hydronephrosis and hydroureters. The liver and spleen were reported to be normal. Some loops of bowels were noted to be distended. There was no free fluid in the abdomen. A provisional diagnosis of degenerating uterine leiomyomas in pregnancy with intestinal obstruction was made and general surgical consult was requested. Patient was jointly managed conservatively with the general surgical team but no improvement of the obstructive symptoms and abdominal pains so a laparotomy was planned by the joint team on the 5th day of admission at the Greater Accra Regional Hospital. Her initial investigations showed Haemoglobin 8.2g/dl so she was transfused 2 units of whole blood and pre- operative Haemoglobin rose to 11g/dl. Three units of whole blood and four units of fresh frozen plasma was cross matched and brought to the theatre for intra-operative transfusion. Her pre-operative renal function and liver function test were all normal.

Findings at laparotomy: Figures 4,7 and 14

Huge mostly subserosal leiomyoma 30cm x 25cm x 20cm with cystic degeneration at its core, extending from the hepatic flexure of the large bowel in the right hypochondria region to the splenic flexure in the left hypochondria region. Its attachment to the uterus was about 12cm at the right anterior fundal part. There were extra uterine blood supplies to the leiomyoma from enlarged vessels of the omentum, right tubo ovarian structures and the parietal peritoneum of the left lateral upper abdominal wall. There were three areas of adhesions and obstruction of the proximal part of the small bowel on the posterior upper part of the leiomyoma which were separated. The upper abdominal organs were compressed against the diaphragm. The gravid uterus was about 24 weeks' size with multiple smaller intramural leiomyomas and adherent to the anterior abdominal wall below the umbilicus so the tubes and ovaries could be fully visualized. There was purulent ascitic fluid of about 200mls. There was active bleeding from the leiomyoma and other structures during the surgery with estimated blood of 2200ml during the operation.

Post-operative management

She was nursed at the high dependency ward. She had an NG tube in for five post-operative days and was receiving 4-5L of intravenous fluids and parenteral nutrition daily. She received iv antibiotics for five days and tocolytics while the NG tube was still draining actively. She received anticoagulation on the first post-operative day but it was discontinued as the abdominal drain was noted to be more bloody. Her post-operative pain management was with parenteral and rectal suppositories medications for the five days. Her vital signs remained stable throughout the post-operative period until she was discharged. All her preoperative symptoms resolved completely by the fifth day post-operation. Serosanguineous fluid totaling 2250mls was drained during the first 5 days after the operation from 500mls to 50mls on the 5th post-operative day. The NG tube also drained a total of about 3200mls in the first 5 days and removed when bowel activity was normal with the passage of stool and flatus. Average amount of urine was 1500mls produced daily until the foleys catheter was removed. She was discharged on the 10th day post-operation with satisfactory wound healing on haematinics to continue antenatal care on outpatient basis.

Her pregnancy progressed to term and had elective caesarean delivery in November 2022 to live male foetus weighing 3.1kg, myomectomy was also performed at caesarean section for two leiomyoma nodules in the lower uterine segment. The placenta was posterior with minor degree previa. Blood loss was about 1.5L so patient was transfused 2 units of whole blood immediately post operation. Her recovery was normal, haemoglobin checked on the third post-operative day was 10.2g/dl and she discharged home with her baby on fifth day after the operation on oral antibiotics and haematinics. The rest of the puerperium was normal without any complications.

Discussion

Myomectomy during pregnancy is not a surgical procedure that should be routinely scheduled. As much as possible it should be avoided in favor of conservative management of complications of leiomyomas during pregnancy. However, myomectomy during pregnancy would to be performed as a lifesaving operation (Rescue Myomectomy) for patients with neglected leiomyomas which may develop very serious life-threatening complications during pregnancy. Cases of myomectomy during pregnancy have been reported dating back to the past 30 years in the literature[6]. As has been presented in these cases reported, the most common indication for myomectomy during pregnancy was abdominal pain not responding to medical treatment as in other publications[6,7,8]. Case no.3 presented with severe life-threatening surgical complications of intestinal obstruction with unsuccessful conservative management. Pain is a common complication of leiomyoma during pregnancy due to red degeneration with majority of patients having successful conservative or medical management[6,7,8]. Complications specific to myomectomy during pregnancy include haemorrhage, preterm delivery both iatrogenic and spontaneous, increased caesarean delivery due to weak uterine scar and formation of adhesions which can affect future pregnancies.

The techniques of myomectomy as described in the standard literature[1,2,3] has associated limitations in myomectomy during pregnancy if it is to be performed same way. The very high risk of intraoperative and post-operative complications is specifically related to hemorrhage. Though there have been reported cases of myomectomy during pregnancy, there is no description of the operative procedure that was used in most publications. The technique reported by D.E Lolis et al is different from the flap technique used in the three cases reported here. This technique of using the serosa and the pseudocapsule of the leiomyoma was first used on a huge cervical leiomyoma presenting abdominally by the lead author[9]. This technique has been successfully used in both myomectomy and sequential myomectomy plus hysterectomy for leiomyomas at inaccessible locations such as the pouch of Douglas which makes application of tourniquet impossible. The flap technique described in this paper minimizes handing of the gravid uterus, avoids enucleation of leiomyoma nodules from myometrium and extensive deep incisions into the myometrium that would require deeper repairs of the myometrium. This also inimizes blood loss, iatrogenic complications, spontaneous abortion, preterm labour, abruption of the placenta and possible maternal mortality.

Due to the high risk of pregnancy loss that may be associated with myomectomy during pregnancy, the patient must clearly understand the risk of loss of pregnancy associated with the procedure and give consent for blood transfusion, use of uterotonics and hysterotomy should life threatening haemorrhage or other intraoperative complications arise. Myomectomy during pregnancy is still a grey area. There is the likelihood of an increasing trend of complicated leiomyomas during pregnancy due spiritual and medical treatments and lack of assess to surgical treatment of cases requiring myomectomy before pregnancy.

Conclusions

Pregnant women may present with life threatening complications of leiomyomas. Antepartum Myomectomy can be considered and successfully performed to improve quality of life or prevent maternal mortality. The procedure for the myomectomy in such situation may not be routine but a special approach is required to avoid fatal complications for both mother and foetus.

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