

## Antepartum Myomectomy and Neonatal Humerus Fracture During Elective Cesarean Section

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Received: August 05, 2023

Published: December 28, 2023

### Abstract

**Objective:** Laparotomic myomectomy during pregnancy is controversial. Humerus fracture is a very rare occurrence after elective cesarean section. We present a case of successful myomectomy performed in the second trimester of pregnancy. Elective cesarean section was planned and was complicated by fetal humerus fracture.

**Case Report:** A nulliparous woman experienced severe abdominal pain at 16 gestational weeks because of torsion of a pedunculated subserosal myoma. Because analgesic therapy failed, laparotomic myomectomy was performed without complication. A male baby was delivered by elective cesarean at 38 completed weeks. After the incision of the lower uterine segment, protrusion of the left arm of the fetus in transverse lie occurred throughout the uterine breach. The arm was gently rotated and replaced in utero. During the obstetric maneuver to attempt breech extraction, the left arm protruded again and was replaced inside the uterine cavity with audible clunk. Successively, breech extraction was successful. Swelling of the arm developed after few hours from birth. On the first day of life, the radiography ruled out humerus fracture. The arm was then immobilized with bandage by the orthopedician. After two weeks, there was complete recovery without residual deformity on discharge.

**Conclusion:** Laparotomic myomectomy is a safe procedure during pregnancy to relief persistent abdominal pain. Although elective cesarean section is felt as a safe procedure, unavoidable and unpredictable long bones injury can still happen.

**Keywords:** Antepartum myomectomy; Cesarean section; Obstetric complications; Humerus fracture; Myoma; Pregnancy

### Introduction

Although uterine myomas are the most common benign pelvic tumors of the female reproductive tract, their prevalence during pregnancy is approximately 2% [1]. They represent a risk factor for adverse obstetrics outcomes, being associated to spontaneous abortion, placenta previa, placental abruption, fetal malpresentation, and mechanical dystocia [2]. Conservative management is preferred during pregnancy, because antepartum surgery increases the risk of severe bleeding and pregnancy loss [3]. However, symptoms arise during pregnancy in 10-20% of cases and surgical interventions is required when symptoms persist despite pharmacological therapy [4]. A very recent systematic review about myomectomy during pregnancy showed that there are very few cases of antepartum myomectomy reported in literature [5].

Neonatal long bones fractures are very rare birth-related injury, being the incidence less than 1/1000 live births [6]. Clavicle fracture is the most common, followed by humerus and femur fracture [7]. Three-fourths of delivery-related long bone fractures occur during vaginal breech delivery and very rarely such complications are described after cesarean section [8]. Among

the latter, the most of cases are reported during emergency cesarean section due to the obstetric maneuvers that are required in order to allow birth as fast as possible [8]. Although there is paucity of data about long bone fracture after elective cesarean section, fetal malposition and breech extraction have been associated to bone fracture.

We report a case of subserosal uterine myoma, which caused persistent abdominal pain during pregnancy and was treated by laparotomic myomectomy. Cesarean section was planned at term pregnancy and was complicated by fetal humerus fracture.

### Case Report

A 33 years old nulliparous woman was admitted to our unit at 16 completed gestational weeks for abdominal pain. Her pregnancy was uneventful. On physical examination, vital signs were normal, there was no vaginal bleeding, laboratory studies were unremarkable, and uterine contractions were absent. The ultrasound examination revealed a viable fetus at 16 gestational age and a 3 cm pedunculated mass on the left side of the uterus. Doppler interrogation showed the vessel supplying the

mass, and dishomogeneous echogenicity of the mass arouse the suspicion of degeneration. The woman referred augmented pain due to the transducer pressure. The presumptive diagnosis was torsion of a peduncolated myoma with degeneration and infarction. Because neither ovary was clearly visualized, magnetic resonance was performed in order to exclude ovarian torsion. Magnetic resonance demonstrated a 3x3 cm sized oval mass on the left side of the uterus with heterogeneous signals secondary to focal blood clots. Fluid collections was observed around the mass. Ovaries appeared normal. A peduncolated subserosal myoma was identified and the final diagnosis was the torsion of the small uterine myoma around its pedicle leading to infarction of the myoma.

The initial management was conservative, but worsening of abdominal pain without response to regular analgesics led to the need of emergency laparotomy. Through the Pfannenstiel incision, a torsion of a peduncolated subserosal myoma with complete necrosis was observed on the left side of the uterine wall. The base and pedicle of the myoma were identified and removed, and haemostasis was completed. Intraoperative blood loss was estimated as minimal and operating time was 40 minutes. Fetal heart beat was recorded both before and after the procedure. The postoperative course was uneventful, the abdominal pain fully regressed, and the woman was discharged from the hospital without complications. The pregnancy proceeded uneventfully and routine obstetric management was performed. Tocolytic therapy was not prescribed. The pathologic diagnosis was uterine myoma with infarction.

A male newborn baby was delivered by elective cesarean section. The indication for cesarean section was laparotomic myomectomy performed at 16 gestational weeks of the actual pregnancy and malpresentation, being the fetus in transverse lie. There was no history of metabolic bone disease, diabetes mellitus or maternal infection. Elective cesarean section was performed at 38 completed weeks. After the incision of the lower uterine segment, transverse lie of the fetus was noted and protrusion of the left arm occurred throughout the uterine breach. The arm was gently rotated and replaced in utero and breech extraction was attempted. However, the right femur was completely extended; hence, it was adducted in order to achieve complete breech presentation. During this maneuver, the left arm protruded again through the uterine breach and was replaced again inside the uterine cavity with audible clunk. Successively, both the two legs were grasped and breech extraction was finally successful.

The newborn did not cry immediately and received oxygen support. Apgar score was 7 at 1 minute and 8 at 5 minutes, arterial cord pH was 7.2. Birthweight was 3185 g. Swelling of the arm was noted after few hours from birth, and brachial plexus injury was firstly suspected. Systematic examination did not reveal further abnormalities. On the first day of life, the radiography of the upper limb was done and humerus fracture was diagnosed.

The arm was than immobilized with bandage by the orthopedician. Vascular and neurologic examination did not reveal any damage. After two weeks, there was complete recovery without residual deformity on discharge. The last follow-up was recorded at 1 month after birth: the baby was able to move the humerus completely and movements were spontaneous and painless.

**Citation:** Cristina Rossi A\*, Angela Anfossi, Giuliano Dicuonzo, Vincenzo Martino and Giuseppe Lovascio. Antepartum Myomectomy and Neonatal Humerus Fracture During Elective Cesarean Section. *IJCMCR*. 2023; 32(5): 004

**DOI:** 10.46998/IJCMCR.2023.32.000799

## Discussion

The differential diagnosis of abdominal pain during pregnancy encompasses both gynecologic and non-gynecologic etiologies [9]. Gynecologic etiology includes spontaneous abortion, threatened preterm delivery, ovarian torsion, inflammatory pelvic disease, whereas non-gynecologic etiology includes appendicitis, cystitis, urinary tract stones. The large size of the myoma and the distance between the placenta and the myoma are associated to adverse obstetric outcomes [10]. However, our case shows that also small myomas located far from the placenta can worsen and may require surgical management. Surgical management is deemed necessary if pain persists for more than 72 hours due to possible necrosis and peritoneal inflammation [11]. Ultrasound is the diagnostic method of first line, but magnetic resonance might be necessary if ultrasound images are unclear. In our case, both the two ovaries were not visualized by ultrasound, thus we performed magnetic resonance, which clearly showed the torsion of a small peduncolated myoma. Since conservative management failed, the woman underwent surgery because the untreated torsion of myoma leads to necrosis, infarction, and peritonitis, resulting to significant maternal morbidity [4].

A very recent systematic review shows that only 70 cases are described in literature, of which in 60 cases laparotomy was chosen, while only 10 were subjected to laparoscopy [5]. The size of myomas ranges from 4 to 40 cm and the gestational age at which the myomectomy is performed, ranges from 8 to 26 weeks. The vast majority of women delivered at term by cesarean section and only 3 pregnancies ended with spontaneous abortion. With regard to the surgical procedure, the choice between laparotomy and laparoscopy is still debated [5]. Given the current lack of evidence-based guidelines concerning the route of myomectomy during pregnancy, we preferred the laparotomic approach. In our case, laparotomic myomectomy was safely performed, but was probably associated to fetal malpresentation.

Long bones fractures are unpredictable complications of the birth-related injury and can still happen by cesarean section during breech extraction [12]. Although there is paucity of data because of its rarity, humerus fracture is generally associated with vaginal breech delivery and emergency cesarean section. To our knowledge, this is the second case of humerus fracture after elective cesarean section. In the previous case [12], cesarean section was performed for transverse lie and the operating obstetrician reported difficult extraction of the baby, inverted T extension was needed and disengagement of the right hand by traction was performed. Similarly, in our case, fetal extraction was difficult, but no energetic traction was applied on the upper limbs. We hypothesized that spontaneous dislodgment of the fetal arm, which occurred twice, might have led to humerus injury. Obstetric risk factors that may predispose to long-bones fractures are prematurity, instrumental delivery, macrosomia, malpresentation, abnormal lie, and multiple pregnancy [7]. In our case, the transverse lie might have led to arm dislodgment and consequently humerus fracture occurred.

Clinical findings of humerus fracture should be promptly differentiated from brachial plexus injury, since postnatal remodeling is very rapid, effective and rarely fails to heal when humerus fracture is detected early [12]. In our case, although brachial plexus injury was suspected during the initial examination, the correct diagnosis was promptly obtained by radiography. Pediatricians should be aware that in the setting of com-

plicated deliveries, both vaginally and abdominally, complete examination of the newborn should include careful investigation of the limbs, even if excessive traction and rotation are not applied to the forearm.

In conclusion, our case report shows that antepartum laparotomic myomectomy is a safe procedure when uterine myoma is subserosal. However, the surgical procedure might lead to fetal malpresentation. During elective cesarean section spontaneous fetal movements can lead to humerus fracture. Because fetal movements are unpredictable, we believe that we could have not neither prevented nor avoided birth injury. Parents should be counseled that cesarean section has been reported to reduce the incidence of birth injury, although long bones fractures are rare but still known complications during planned cesarean section. However, appropriate investigation and management prevent future deformities and disabilities.

#### Authors' contribution:

- A.C. Rossi: project development, manuscript writing;
- A. Anfossi and G. Dicuonzo: collected data about the pregnancy, commented on the previous versione of the manuscript;
- V. Martino and G. Lovascio: collected data about the antepartum myomectomy, commented on the previous versione of the manuscript.

All the Authors read and approved the final version, and gave final consensus on the publication.

The patient gave written informed consent to the potential publication.

**Statement and declaration:** The authors declare that no funds, grants, or other support were received during the preparation of this manuscript. The authors have no relevant financial or non-financial interests to disclose. The Authors have no conflict of interest to declare.

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