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Fertility after Abdominal Myomectomy: A Retrospective Study of 64 Cases

Stephane Adjoussou[1*], Raoul Kasse[2], Souleymane Soumahoro[3], Kouamé Tano[3], Ibrahim Kanté[4], Fulgence Kouamé[1], Marcel Ettien[1], Rosemonde Kouakou[1], Mamourou Koné[5]

[1]Department of Obstetrics and Gynecology, Felix Houphouët-Boigny Regional Hospital of Abobo, Abidjan, Côte d'Ivoire
[2]Department of Obstetrics and Gynecology, Teaching Hospital of Cocody, Abidjan, Coŧe d'Ivoire
[3]Department of Obstetrics and Gynecology, Teaching Hospital of Angré, Abidjan, Coŧe d'Ivoire
[4]Department of Obstetrics and Gynecology, Point G Teaching Hospital, Bamako, Mali
[5]Fatima Medical Clinic, Abidjan, Coŧe d'Ivoire
Email: *alfonzoste@hotmail.com

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Abstract

Objective: To evaluate fertility after abdominal myomectomy. **Patients and Methods:** This was a retrospective descriptive and analytical cohort study conducted at the Fatima Clinic over a 7-year period, involving 64 infertile patients under 40 years of age who underwent abdominal myomectomy. We analyzed the operative data from the myomectomy and fertility after this procedure. **Results:** The mean age of our patients was 34.5 years, with a range of 28 to 39 years. The majority of our patients were nulliparous (90.6%), with a mean parity of 0.09. Infertility was secondary in 76.5% of cases. The mean uterine size was 13.2 weeks of gestational age in our study. Interstitial fibroids were the most frequent (90.6%). The average number of fibroids removed was 9.1, and the average size of the dominant fibroid was 7.7 cm. The most frequent surgical procedure associated with myomectomy was adhesiolysis (23.4%), followed by adenomyomectomy (17.2%). In our study, the average operative time was 107.4 minutes. The incidence of operative complications observed in our study was 3.2%. Postoperative complications consisted of bowel obstruction and hemorrhage. The spontaneous pregnancy rate in our patients was 20.3%. The average time to pregnancy after myomectomy was 11 months. We obtained 9 live births out of the 13 pregnancies observed, representing a 69.2% success rate. The only prognostic factor identified that favored the occurrence of a spontaneous pregnancy was the patients' significantly lower age ($p = 0.04$). **Conclusion:** Abdominal myomectomy is a reliable, safe, and effective technique that has enabled infertile women with fibroids to achieve pregnancy.

Keywords

Myomectomy, Laparotomy, Infertility, Pregnancy

1. Introduction

Leiomyoma, commonly known as a fibroid, is the most frequent benign tumor in women of reproductive age (20% to 45% of premenopausal patients) [1]. This high incidence makes fibromatous disease a significant public health issue [2]. According to most authors [3]-[5], Black women develop more fibroids at a younger age and with larger fibroids than White women. The standard treatment for symptomatic fibroids remains hysterectomy or myomectomy via laparotomy. Myomectomies are primarily performed on women of reproductive age whose fibroids are symptomatic: menorrhagia or menometrorrhagia, pelvic pain, and signs of compression of adjacent organs, particularly the bladder with pollakiuria and the rectum with constipation. These uterine fibroids can also cause infertility, but this etiology should only be considered after ruling out all other factors of infertility through a complete workup [6]. Numerous hypotheses have been proposed to explain the infertility related to fibroids [7]. These include: abnormalities in uterine contractility caused by the fibroid, which can hinder gamete transfer or implantation of the egg; alterations of the uterine lining related to fibroid development; abnormalities in uterine vascularization; and cornual obstruction by fibroids. Furthermore, it should be noted that data on fertility after myomectomy by laparotomy are scarce in sub-Saharan Africa, including in our country, Côte d'Ivoire. For all these reasons, we wanted to evaluate fertility after abdominal myomectomy in patients with uterine fibroids by reporting our experience.

2. Materials and Methods

Our study was conducted at the Fatima Medical Clinic, located in Abidjan, the Ivory Coast. This medical facility specializes in the management of both benign and malignant gynecological conditions. This was a retrospective descriptive cohort study conducted over a seven-year period, from 2013 to 2019. The study population consisted of patients who consulted for infertility and underwent abdominal myomectomy. Infertile patients with fibroids who were aged 40 years or younger were included in the study. Patients in whom clinical and paraclinical investigations (hysterosalpingography, ovulation monitoring, semen analysis) revealed other causes of infertility besides the presence of uterine fibroids were excluded. Patients lost to follow-up or with incomplete records were also excluded. Records were considered incomplete if the operative report could not be found. Our sample consisted of a consecutive, non-randomized series of 64 patients. Initially, 79 records were collected. After applying the exclusion criteria, 15 records were excluded. Ten patients had other causes of infertility, and 5 patients were lost

to follow-up. All patients admitted to the clinic for abdominal myomectomy signed an informed consent form upon admission, authorizing the clinic to use their medical records for potential research. Furthermore, the study was approved by the institution's local ethics committee. Myomectomy was performed via laparotomy under regional anesthesia or general anesthesia when the uterus was too large. The type of incision on the uterus (anterior-posterior or fundic) depended on the position and location of the fibroids. After enucleation of the fibroids, hysterorraphy was performed in two or three layers, depending on whether or not the uterine cavity was opened. The cavity was sutured with 3-0 Vicryl, the myometrium with 1-0 Vicryl, and the serosa with 2-0 Vicryl. The abdominal cavity was thoroughly irrigated with saline solution before abdominal wall closure. After the procedure, a normal diet was permitted once bowel function had resumed. Patients were discharged on postoperative day 3 or 4. All patients were then seen for a gynecological consultation one month after the procedure. Two months postoperatively, a second-look hysteroscopy was performed on patients whose uterine cavity had been opened during their myomectomy. This second look allowed for the identification and treatment of any postoperative uterine synechiae. A second-look laparoscopy was also offered to all patients two months later. When performed, this laparoscopy included an initial diagnostic phase to identify any postoperative adhesions. The second phase of the laparoscopy was surgical, involving the most complete adhesiolysis possible. Fertility was then assessed by monitoring the occurrence or absence of pregnancy over a period of at least 5 years. Follow-up visits were scheduled at 3 months, 6 months, and 6 months thereafter. At each visit, the occurrence of pregnancy and pregnancy outcome were noted. Those women who could not visit the clinic at any particular follow-up were contacted telephonically, and the required information was obtained. No patients used assisted reproductive technology during follow-up. We also attempted to determine prognostic factors for pregnancy by comparing the group of operated patients who achieved pregnancy to the group of operated patients in whom infertility persisted after 5 years. All data were collected from patient records, including operative reports and postoperative follow-up. Data analysis was performed using Epi Info 3.5.3 statistical software. We conducted a comprehensive description of the patients' sociodemographic and clinical characteristics. Quantitative variables were described in terms of median and interquartile range (IQR). Qualitative variables were described in terms of weighted frequencies rounded to the nearest whole number and percentages. Univariate analysis of prognostic factors for pregnancy was performed. The statistical tests used were: Chi-square, Fisher's exact test in case of invalidity of the Chi-square given the small sample size, Student's t test for comparing means, and the significance threshold was set at 5%.

3. Results

The epidemiological characteristics of the patients and the myomectomy data are

reported in Table 1 and Table 2. The 35 - 40 age group represented 51.5% of cases. Nulliparous women represented 90.6% of cases. The duration of infertility was between 2 and 5 years in 44% of cases. An anterior and posterior incision was performed in 52 patients (81.2%) and 51 patients (79.6%), respectively. Interstitial fibroids were found in 90.6% of patients. Submucosal and subserosal fibroids were present in 34.3% and 71.8% of cases, respectively. The number of fibroids removed was less than 5 in 37.5% of cases. The largest fibroid removed was between 5 and 10 cm in 62.5% of cases. Adhesiolysis was associated with myomectomy in 23.4% of cases, and adenomyomectomy in 17.2% of cases. We also noted two postoperative complications, representing an incidence of 3.2%. These were an obstructive syndrome requiring surgical reintervention, and a postoperative hemorrhage requiring further treatment in the operating room with bilateral ligation of the hypogastric arteries. Postoperative follow-up and fertility prognosis are reported in Table 3. Second-look hysteroscopy performed on the 17 patients who had experienced uterine cavity perforation revealed synechiae in 5 patients, who underwent hysteroscopic synechiae removal either at the same time or a few days later. Second-look laparoscopy performed in 34 patients allowed for adhesiolysis in 32 patients, all of whom presented with postoperative adhesions. The spontaneous pregnancy rate observed in these patients was 20.3% (13 pregnancies). We obtained 9 live births out of the 13 observed pregnancies, representing a 69.2% (9/13) success rate. All births were by cesarean section. Of the 13 pregnancies achieved, 4 ended in spontaneous miscarriages during the first trimester. We did not observe any complications such as uterine rupture or ectopic pregnancy. In our study, the only prognostic factor identified as favoring the occurrence of a spontaneous pregnancy was the patients' age (Table 4). Indeed, significantly ($p = 0.04$), the patients who achieved a pregnancy were significantly younger (33 years) compared to those who did not (34.9 years).

Table 1. Patients' epidemiological characteristics.

Patients' Epidemiological Characteristics	**n (%)**
Average age	34.5
Average gravidity	1.4
Average parity	0.09
History of miscarriages	15 (23.4)
History of myomectomy	5 (7.8)
Secondary infertility	49 (76.5)
Average duration of infertility (years)	3.9

Table 2. Myomectomy operative data.

Myomectomy Operative Data	**n (%)**
Average uterine size (GA)	13.2
Anterior incision	52 (81.2)
Interstitial fibroids	58 (90.6)
Average number of fibroids removed	9.1
Average size of the largest fibroid (cm)	7.7
Opened the uterine cavity	17 (26.6)
Associated adhesiolysis	15 (23.4)
Average operative time (min)	107.4
Postoperative complications	2 (3.2)

Table 3. Postoperative monitoring and fertility prognosis.

Postoperative Monitoring and Fertility Prognosis	**n (%)**
Synechiae hysteroscopic removal	5 (7.8)
Second-look laparoscopy	34 (53.1)
Laparoscopic adhesiolysis	32 (50)
Spontaneous pregnancy	13 (20.3)
Average time to pregnancy (months)	11
Live births	09 (14)

Table 4. Pregnancy prognostic factors.

Pregnancy Prognostic Factors	**Pregnancy (13)**	**Absence of Pregnancy (51)**	***P***
Average age	33	34.9	**0.04**
Average parity	0.07	0.09	**0.8**
Average uterine size (GA)	13.5	13.1	**0.4**
Interstitial fibroids	12	46	**0.1**
Average number of fibroids removed	7.9	9.5	**0.1**
Opened the uterine cavity	4	13	**0.4**
Laparoscopic adhesiolysis	8	24	**0.2**

4. Discussion

The average age of our patients was 34.5 years, with a range of 28 to 39 years. The most represented age group was 35 to 40 years. Our results differ from those of Belinga in Cameroon [8] and Marchupalli [9] in the USA, who found that the predominant age group among patients who underwent abdominal myomectomy was 31 to 36 years. This could be explained by the fact that this age range corresponds to the time when the hormonal influence on fibroids is at its peak, and therefore, they are sufficiently numerous and large to interfere with fertility. The majority of our patients were nulliparous (90.6%). Our results are similar to those of Belinga [8], who found 74.5% nulliparous women in his study. These results are also similar to those of Marchupalli [9] and Adesina [10], who also found a majority of nulliparous women in their studies, with 53.9% and 77%, respectively. Among our patients, 7.8% had a history of myomectomy. This clearly demonstrates that women who have undergone myomectomy are not immune to potential recurrence. Among our patients, 76.5% presented with secondary infertility. The average duration of infertility was 3.9 years. In the general population, the prevalence of infertility, defined as at least one year of trying to conceive without success, is estimated to be between 10% and 15% [11]. For women with fibroids who require surgical intervention, analysis of several studies shows an increased risk of infertility. Rubin found 40% infertility in a retrospective series of patients operated on for uterine fibroids [12]. Buttram, in his meta-analysis of 1698 patients operated on for fibroids, found 27% infertility [13]. The sole indication for myomectomy in our study was infertility. According to the literature [14] [15], laparotomy myomectomies are primarily performed in cases of symptomatic polymyomatous uteri or in infertile patients with multiple interstitial fibroids, especially when they have a large diameter and an inner border close to the endometrium. Hysteroscopy is used for submucosal fibroids less than 4 cm in diameter, and laparoscopy is mainly for single interstitial and/or subserosal fibroids measuring 3 to 8 cm. Interstitial fibroids were the most frequent in our study, found in 90.6% of our patients. Our result is similar to those of most authors. Indeed, Belinga [8] also found a majority of interstitial fibromas (64%), as did Marchupalli [9], who found 64.6% interstitial fibromas.The average number of fibromas removed was 9.1. This figure is close to that of Belinga [8], in whom the average number of fibromas removed by laparotomy was 8.9. In Kubinova's study [16] in Prague, the average number of fibromas removed during myomectomies by laparotomy was 2.3, which is much lower than our results. This could be explained by the study populations. In fact, in this study, which took place in the Czech Republic, the patients were white, while in ours, they were exclusively black. Kjerulff et al. [4] examined whether there was a difference in fibroids between Negroid and Caucasian types in terms of severity, symptom presence, and age at diagnosis. This study included 409 black women and 836 white women aged 18 and over who underwent hysterectomy for benign conditions, including 301 black women and 281 white women for fibroids. The authors concluded that black women had

larger and more numerous fibroids despite the younger age at diagnosis and hysterectomy. In our study, the average size of the dominant fibroid was 7.7 cm. Our results are similar to those of Kubinova [16], in whose study the average size of the dominant fibroid was 7.4 cm. In contrast, in Dubuisson's study [17], the average size of the dominant fibroid was 4.9 cm, but these were myomectomies performed laparoscopically, a procedure primarily indicated for fibroids measuring 3 to 4 cm. The most frequent type of incision was anterior (81.2%). According to most authors [17]-[19], uterine-adnexal adhesions are significantly more frequent with posterior myomectomy incisions compared to fundic or anterior incisions. Therefore, it is recommended, whenever possible, to favor anterior or antefundic incisions and to reduce the length and number of posterior incisions. It is often possible to extract several fibroids through a single fundic incision via laparotomy. When this is not possible, a second-look laparoscopy to release adhesions should be considered. We also noted two postoperative complications, representing an incidence of 3.2%. These were an occlusive syndrome requiring surgical reintervention, and a postoperative hemorrhage requiring treatment in the operating room with bilateral ligation of the hypogastric arteries. Most authors conclude that abdominal myomectomy has a significant morbidity risk [20] [21]. This procedure exposes patients to a risk of hemorrhage requiring transfusion (20%), intraoperative visceral injuries, and postoperative complications such as fever, wound infection, and thrombophlebitis. Our low rate of complications, particularly hemorrhagic complications, is explained by the fact that all our myomectomies were performed after the application of a supra-isthmic tourniquet, which significantly reduced bleeding during the procedure. In the medium and long term, myomectomy poses the problem of recurrence of symptomatic fibroids as well as that of post-myomectomy adhesions and uterine synechiae. In our study, second-look hysteroscopy revealed synechiae in 5 patients out of the 17 patients who had their uterine cavity opened. These patients were able to undergo hysteroscopic synechiae removal either at the same time or a few days later. Second-look laparoscopy performed on 34 patients allowed for adhesiolysis in 32 patients, all of whom presented with postoperative adhesions. The spontaneous pregnancy rate obtained after abdominal myomectomy in our infertile patients was 20.3%. Our figures are lower than those reported by other authors. Kubinova [16] reports a 24-month pregnancy rate of 47.6%, while this rate was 47.9% in the study by Belinga [8]. The meta-analysis by Vercellini et al. reported a one-year conception rate of 57% in 138 prospectively included patients who underwent laparotomy myomectomy [22]. The difference with our results is explained by the different study populations. The average age of our patients was relatively high, with a mean age of 34.5 years, and 51.5% of our patients were over 35 years old. A woman's natural fertility declines with age: the decline becomes significant after 30 and accelerates between 35 and 40, such that fertility is almost nonexistent by age 45. The main mechanism is the quantitative and qualitative deterioration of ovarian reserve, which accelerates after the age of 38 [23]. Furthermore, our patients pre-

sented with other infertility factors discovered during the procedure, such as pelvic adhesions and adenomyosis. Adhesiolysis was associated with myomectomy in 23.4% of our patients, and adenomyomectomy in 17.2% of cases. The average time to pregnancy after myomectomy was 11 months. This time is close to that reported by Bang [24], who found an average time to conception of 12 months after abdominal myomectomy. Furthermore, 3/13 (23%) of our pregnant patients conceived before 6 months. Therefore, the minimum recommended waiting period of 6 months before conception after uterine surgery was not respected. We obtained 9 live births out of the 13 pregnancies observed, representing a 69.2% success rate. The spontaneous miscarriage rate was 30.8%. According to data from the literature, the miscarriage rate increases with age: 15% at 30 years, 20% at 37 years, and 27% at 42 years [23]. In our study, the only prognostic factor identified as favoring the occurrence of a spontaneous pregnancy was the patients' age. Indeed, significantly ($p = 0.04$), patients who achieved a pregnancy were significantly younger (33 years) compared to those who did not (34.9 years). Other prognostic factors, such as parity, uterine size, type of fibroid, number of fibroids removed, opened uterine cavity, and laparoscopic adhesiolysis, were not significantly associated with the occurrence of a pregnancy. Our results are consistent with the literature, which finds that age has a significant impact on the spontaneous pregnancy rate after abdominal myomectomy. This pregnancy rate is lower in women over 40, and patients who conceive spontaneously after surgery are significantly younger [25]-[27]. These same authors conclude that fertility outcomes in women who have undergone abdominal myomectomy are not significantly influenced by the type, size, and number of fibroids before surgery. Like any clinical study, this one has limitations. It is a single-center retrospective study, with recruitment taking place in a clinic specializing in infertility, which introduced a selection bias. Other limitations of the study include the small sample size and the fact that nearly half of the patients were unable to undergo a second-look laparoscopy, which may introduce analytical bias. Moreover, the small number of pregnancies limits the precision of prognostic-factor analyses and prevents strong inferences from non-significant associations.

5. Conclusion

This study shows that pregnancy occurred after abdominal myomectomy in patients with fibroids who desire motherhood. It is a reliable, safe, and effective technique. These myomectomies are primarily intended for infertile patients with polymyomatous uteri and multiple interstitial fibroids, often of significant diameter. The prognosis for fertility after abdominal myomectomy is good, provided that the patients are not too old, are properly operated on, and have no other factors contributing to infertility.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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