

## Evaluation of the fertility of patients after myomectomy in the department of Gynecology-Obstetrics of the Yalgado Ouedraogo University Hospital Center in Ouagadougou, Burkina Faso

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### Abstract

**Objective:** To assess the fertility of patients after myomectomy in the Department of Gynecology-Obstetrics of the Yalgado Ouedraogo University Hospital Center from September 1, 2014 to August 31, 2018.

**Patients and methods:** This were a retrospective cross-sectional descriptive and analytical exposure study with repeated survey and included patients of childbearing age who had undergone myomectomy during the study period; whose myomectomy is at least six (06) months old; having expressed a desire to become pregnant for at least twelve (12) months according to the definition of infertility; and having given their informed consent to the interview.

**Results:** A total of 102 patients were included in our study. Infertility was primary in 64.71% and secondary in 35.29%. The mean age of the patients was  $35.08 \pm 5.42$  years. Housewives accounted for 37.25%, and married women 66% of patients. After the myomectomy, 44 respondents (43.14%) achieved pregnancy; including 28/66 patients after primary infertility, and 16/36 after secondary infertility. The mean time to conception was  $5.63 \pm 3.46$  months after the start of her postoperative quest. We observed 90.91% live births. Cesarean section was performed in 82.5% of patients and vaginal route in 17.5% of them. The main factors associated with fertility after myomectomy were: young age ( $p = 0.000$ ), duration of infertility ( $p = 0.000$ ), normal hysterosalpingography result ( $p = 0.000$ ) and normal result spermogram of the spouse ( $p = 0.029$ ).

**Conclusion:** The relationship between myoma and infertility has not been clearly demonstrated. However, based on our results and given the difficulty of accessing ART, it seems lawful to us to offer myomectomy to patients with infertility associated with myomas, especially in patients under 35 years of age. A larger study would better establish the impact of myomectomy on the subsequent fertility of patients.

**Keywords:** Fibromyomas; Uterus; Myomectomy; Post-operative fertility; CHU-Yalgado Ouedraogo; Burkina Faso

### 1. Introduction

The impact of uterine fibroids on fertility is a subject of controversy, and to date, no study has been able to determine the threshold, number, size or location of fibroids above which the risk is significant [1]. In the case of in vitro fertilization (IVF), Stowall team from the University of Iowa in the United States demonstrated the deleterious effect of myomas on the result of IVF [2]. Fibroids can act directly on the decrease in fertility, by mechanical action (alteration

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of the permeability of the fallopian tube at the interstitial level, enlargement of the uterine surface, alteration of the cervix, etc.) or indirectly through the intermediary of the hyperestrogenia. Sometimes, associated endometrial abnormalities are also found, which are responsible for impaired egg receptivity [3]. The fertility result expected after myomectomy is also controversial, but it still depends on the characteristics of the fibroids considered. In the 2011 CNGOF clinical practice guideline, treatment of submucosal fibroids improves fertility and the level of evidence is high [4]. A few studies carried out in sub-Saharan Africa after myomectomy support this recommendation: 21.8% pregnancy rate in Libreville [5], 45.79% in Côte d'Ivoire [6]. Very few studies have been conducted in Burkina Faso on fertility after myomectomy despite the fact that the problem is posed with as much acuity, hence the need for us to conduct the present study.

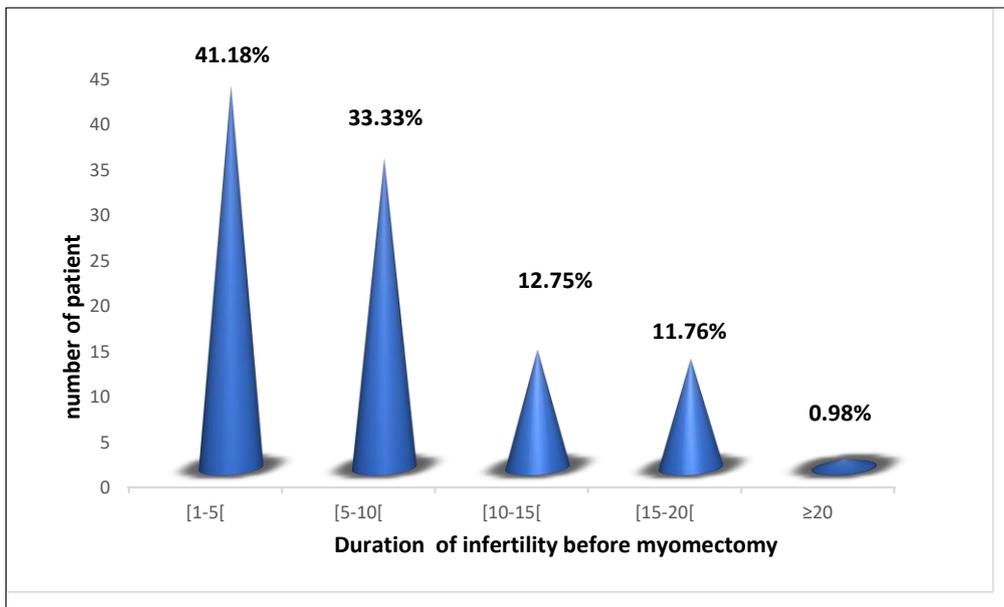
## 2. Material and methods

### 2.1. Patients and methods

We conducted a single-center study in the Department of Gynecology-Obstetrics (DGO) of the Yalgado Ouedraogo University Hospital Center. This was a retrospective descriptive and analytical cross-sectional study of exposure with repeated survey over a period of five (05) years, from September 1, 2014 to August 31, 2018. The questionnaire was administered from March 1, 2020 to May 31, 2020 over a period of three (03) months. A total of 102 patients who underwent myomectomy for pregnancy desire were included in the study. Data analysis was performed with Epi Info software to calculate means, percentages and standard deviation. We used the Student test and the Chi2 test with a significance level  $p < 0.05$ .

## 3. Results

A total of 102 patients were included in our study. Infertility was primary in 66 patients (64.71%) and secondary in 36 patients (35.29%). The average duration of infertility before myomectomy was  $6.94 \pm 4.88$  years with extremes of 1 and 20 years. Figure 1 illustrates the distribution of respondents according to the duration of infertility before myomectomy.



**Figure 1** Distribution of respondents according to the duration of infertility before myomectomy (n=102)

Table 1 gives the distribution of the respondents according to the **seat** of the myomas.

**Table 1** Distribution of the respondents according to the site of the myomas (n=102)

Site of the myomas	Number of patient	Percentage (%)
I	11	10.78
SM	02	1.96
I+SM	15	14.71
I+SS	43	42.16
SM+SS	01	0.98
I+SM+SS	30	29.41
Total	102	100

I: interstitial; SM: submucous; SS: subserous

Table 2 gives the distribution of respondents according to the number of myomas.

**Table 2** Distribution of the respondents according to the number of myomas (n=102)

Number of myomas	Number of patient	Percentage (%)
<5	23	22.55
[5-10[	33	32.35
[10-15[	25	24.51
[15-20[	07	6.86
[20-25[	03	2.94
[25-30[	05	4.90
≥30	06	5.88
Total	102	100

The average size of the largest myoma was  $9.28 \pm 4.88$  cm with extremes of 3 and 30 cm. The effraction of the `uterine cavity was observed in 48 respondents (47.06%). The postoperative course was simple for all our patients. Of the 102 patients who consulted for infertility, 44 respondents (43.14%) obtained a pregnancy, including 28/66 patients after primary infertility, and 16/36 after secondary infertility. Pregnancy was obtained on average  $5.63 \pm 3.46$  months after the start of its quest postoperatively; with extremes of 02 and 20 months. The pregnancy outcome was favorable in almost all of our patients. One patient underwent cervix suture for incompetence of the cervix, but delivered at term. One patient presented with a spontaneous abortion. In our study, 40 respondents gave birth. Caesarean section was the delivery route for 33 patients (82.5%) and the vaginal route was observed in 07 patients (17.5%).

The relationship between sociodemographic factors and fertility was analyzed in Table 3.

A very highly statistically significant link was demonstrated between the patient's age at the time of the operation and fertility after myomectomy ( $p=0.000$ ).

Marital status did not appear to have a statistically significant relationship with fertility after myomectomy ( $P > 0.05$ ).

The relationship between history and fertility was analyzed in Table 4.

**Table 3** Relationship between sociodemographic factors and fertility

Factors	Number of patient	Pregnancy n (%)	No Pregnancy n (%)	p
<b>Age (year)</b>				
≤ 30	27	24 (88.89)	03 (11.11)	0.000
>30	75	55 (73.33)	20 (26.67)	
<b>Origin</b>				
Rural	06	04 (66.67)	02 (33.33)	
Urban	96	40 (41.67)	56 (58.33)	0.230
<b>Schooling</b>				
Yes	71	34 (47.89)	37 (52.11)	
No	31	10 (32.26)	21 (67.74)	0.142
<b>Marital status</b>				
Married women	67	31 (46.27)	36 (53.73)	0.376
Unmarried women	35	13 (37.14)	22 (62.86)	

**Table 4** Relationship between history and fertility

Factors	Number of patient	Pregnancy n (%)	NoPregnancy n (%)	P
<b>Type of infertility</b>				
Primary	66	28 (42.42)	38 (57.58)	0.843
Secondary	36	16 (44.44)	20 (55.56)	
<b>Number of deliveries</b>				
00	79	38 (48.10)	41 (51.90)	0.060
≥ 1	23	06 (26.09)	17 (73.91)	
<b>History of myomectomy</b>				
Yes	07	01 (14.29)	06 (85.71)	
No	95	43 (45.26)	52 (54.74)	0.112
<b>Family history of uterine fibroids</b>				
Yes	39	15 (38.46)	24 (61.54)	
No	63	29 (46.03)	34 (53.97)	0.453
<b>Family history of infertility</b>				
Yes	33	12 (36.36)	21 (63.63)	0.339
No	69	32 (46.37)	37 (53.62)	

Neither the type of infertility, nor the number of parents, nor the history of myomectomy, nor the family history of uterine myoma, nor the family history of infertility seem to present a statistically significant link with fertility after myomectomy ( $p > 0.05$ ).

The relationship between infertility history and fertility was analyzed in Table 5.

**Table 5** Relationship between infertility history and fertility

Factors	Number of patient	Pregnancy n (%)	No Pregnancy n (%)	P
<b>Duration of infertility before myomectomy</b>				
5 ≤ years	56	39 (6.64)	17 (30.36)	0.000
5 > years	46	05 (10.87)	41 (89.13)	
<b>HSG results before Myomectomy</b>				
Normal	36	24 (66.67)	12 (33.33)	0.000
Pathological	61	15 (24.59)	46 (75.41)	
<b>Spermogram results of spouses before myomectomy</b>				
Normal	69	32 (46.38)	37 (53.62)	
Pathological	10	01 (10)	09 (90)	0.029

**Table 6** Relationship between myomectomy data and fertility

Factors		Number of patient	Pregnancy n (%)	No Pregnancy n (%)	p
<b>Site of myomas</b>					
Interstitial	Yes	99	44 (44.44)	55 (55.56)	0.125
	No	03	00 (0)	03 (100)	
Submucous	Yes	48	21 (43.75)	27 (56.25)	0.906
	No	54	23 (42.59)	31 (57.41)	
Subserous	Yes	74	33 (44.59)	41 (55.41)	0.629
	No	28	11 (39.29)	17 (60.71)	
Single site	Yes	13	5 (38.46)	08 (61.54)	0.715
	No	89	39 (43.82)	50 (56.18)	
<b>Size of the largest myoma</b>					
< 10 cm ≥ 10 cm		65	29 (44.62)	36 (55.38)	0.689
		37	15 (40.54)	22 (59.46)	
<b>Number of myomas</b>					
Unique Multiple		05	01(20)	04(80)	0.284
		97	43 (44.33)	54 (55.67)	
<b>Rupture of the uterine cavity</b>					
	Yes	48	21 (43.75)	27 (56.25)	0.906
	No	54	23 (42.59)	31 (57.41)	

A very highly statistically significant link was demonstrated between the duration of infertility before myomectomy and fertility after myomectomy ( $p=0.000$ ). The same is true for the results of the hysterosalpingography (HSG) before the myomectomy ( $p=0.000$ ). A statistically significant relationship between preoperative spermogram results and post-myomectomy fertility was observed ( $p=0.029$ ).

The relationship between myomectomy data and fertility was investigated in Table 6.

Neither the site, nor the size, nor the number of myomas, nor the presence of an invasion of the uterine cavity during the operation seem to present a statistically significant link with fertility after myomectomy ( $p > 0.05$ ).

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#### 4. Discussion

Of the 102 patients who consulted for infertility, 44 respondents (43.14%) obtained a pregnancy; including 28/66 patients after primary infertility, and 16/36 after secondary infertility. A review of the literature by Poncelet and al [7] found a pregnancy rate after myomectomy ranging from 9.6% to 76.9%. Our rate remains lower than data from the Western literature. Indeed, Donna and al [8] found a conception rate of 75%. The same is true of Vercellini and al [9]; Li and al [10] and Soriano and al [11] who respectively found a conception rate of 57%, 56.8% and 55.6%. These differences could be explained by the level of technological development in the field of health. In these countries, additional examinations as well as Medically Assisted Procreation (M.A.P) are available and accessible to a greater majority of patients. Nevertheless, even outside of any M.A.P, spontaneously nearly 60% of patients were able to conceive according to Poncelet and al [7]. The conception rate of 43.14% that we found in our study is close to that of Yao [6] in Ivory Coast which was 45.79%. This result could be explained by the similarity of the study populations and the technical platform, these two countries being neighbours. Similarly, Chaker and al [12] found a conception rate of 46.34% in Tunis. On the other hand, our rate is higher than that of Bang Ntamack and al [5] in Gabon, which was 21.8% conception.

Pregnancy was obtained on average  $5.63 \pm 3.46$  months after the start of her postoperative quest; with extremes of 02 to 20 months. This average time to onset of pregnancy seems short in our study compared to those of Dessole and al [13]; Chaker and al [12] which are on average 7 months and 16 months respectively. This could be explained by the fact that our calculation was made with the starting point of the actual start of the procreation attempt after the surgical intervention and not since its completion date. The pregnancy outcome was favorable in almost all of our patients. We observe 90.91% of live births. Our rate is similar to what Verit [14] found, which was 90.9% live births after myomectomy. This rate remains lower than that of Donna and al [8] which was 100% live birth with no spontaneous abortion. This result could be explained by their smaller sample size. Nevertheless, our rate is higher than reported respectively by Yao [6]; Rakotomahenina and al [15] in France, which was 84.70% and 82.22% of children alive. It should be remembered that spontaneous abortions are not necessarily linked to myomectomy because generally speaking, about 60% are due to chromosomal abnormalities [16]. Caesarean section was the way of delivery for 82.5% of patients and the vaginal route was observed in 17.5% of patients. This rate is comparable to that of Yao [6] which was 87.64% of deliveries by caesarean section. It is higher than that found by Rakotomahenina and al [15] which was 60.6% of deliveries by caesarean section. The observation is rather logical because in addition to the history of infertility and late pregnancy, the fear of obstetricians is essentially uterine rupture with the uterus which is considered to be scarred [11].

Young age is an asset for fertility after myomectomy. These data are corroborated by most authors [12, 17, 18] who confirm the reduction in the pregnancy rate after myomectomy beyond the age of 35. In our study, a very highly statistically significant link was demonstrated between the patient's age at the time of the operation and fertility after myomectomy ( $p=0.000$ ). In the texts of the recommendations, the French National college of Obstetricians and Gynecologist stipulates that myomas certainly play a role in infertility, but this role is mainly related to age [4]. In our study, no pregnancy was possible after 39 years. Indeed, the natural fertility of women decreases with age: its fall becomes noticeable after 30 years and accelerates between 35 and 40 years, so that fertility is almost nil at 45 years. The main mechanism is the quantitative and qualitative alteration of the ovarian reserve which accelerates after the age of 38 years [19]. The type of primary or secondary infertility does not seem to be related to fertility after myomectomy in our study. Indeed, we did not find a statistically significant link between the type of infertility and fertility after myomectomy ( $p=0.843$ ). Also according to Chaker and al [12], no significant difference was noted in terms of subsequent fertility between the group of respondents with primary infertility compared to that with secondary infertility. Two other studies confirm our observations, those of Marchionni and al [20]; Campo and al [16]. Nevertheless, Rakotomahenina and al [15] observed in their study that those who were nulligest before myomectomy were less likely to have a pregnancy compared to those who had already had a pregnancy ( $p=0.003$ ). The length of infertility seems to have a negative impact on fertility after myomectomy. A very highly statistically significant link

( $p=0.000$ ) was demonstrated. Indeed, we observe that the longer the duration of infertility before the myomectomy, the less the women were able to conceive. This could be explained by the fact that the probability of obtaining a pregnancy or even a live birth after one year of trying goes from 75% at the age of 30 to 55% at the age of 38, then at 30% at age 43 [19]. Chaker and al [12] came to the same conclusion by suggesting myomectomy, especially to young women with infertility under five years of age. A normal preoperative hysterosalpingography (HSG) result seems to be an argument in favor of a return to fertility after myomectomy. We found a conception rate of 66.67% in patients in whom HSG was normal preoperatively with a very highly statistically significant link ( $p=0.000$ ). Donna and al found a 75% higher rate of pregnancies in patients with normal HSG and no other detectable pathology [8]. We found a link between the result of the spermogram of the spouse and the fertility of the respondent ( $p=0.029$ ). Nevertheless, this result could only be explained in the conditions where other pathologies that could explain the infertility in the respondents apart from fibroids have been eliminated; especially tubal obstructions. According to Bajekal and al, 50% of women with unexplained infertility become pregnant after myomectomy [1]. This unexplained infertility means that the results of the spermograms are normal and without any other pathology found in the woman apart from fibroids. The intrinsic parameters of the myomas (site, size, number of myomas) had no influence on the rate of occurrence of pregnancy after myomectomy in our study ( $p > 0.05$ ). In the literature, it seems that to date for the majority of authors, there is no role played by characteristics such as the number, type or location of myoma that is statistically significant, in connection with fertility and pregnancy complications [11]. These hypotheses were reiterated by Zhang and al who concluded that the number of myomas has no influence on the obstetrical future of patients [21]. For Chaker and al [12], no significant difference was noted regarding the number, size or location of myomas during surgery compared to subsequent fertility. Nevertheless, according to Garcia et al, 63% of these respondents obtained a pregnancy within an interval of 11 months after removal of a submucosal myoma. Thus, resection of submucosal fibroids increases fertility compared to infertile controls without fibroids [22]. Sudik et al found 65.2% conception after removal of subserous or interstitial myomas. Similarly, according to him, the pregnancy rate was significantly higher in patients with less than five myomas removed or in whom the volume of the myoma was greater [23]. In our study, a 38-year-old respondent who had bilateral tubal obstruction before myomectomy showed a return to fertility after myomectomy. One might wonder whether the location and/or the size of the fibroids would not be the cause of this tubal obstruction before the myomectomy.

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## 5. Conclusion

At the end of our study, it appears that uterine myomas in the population of women of childbearing age, remain a major public health problem in our country because encountered in many cases of infertility. A myomectomy remains a therapeutic approach for these patients. We find a significant pregnancy rate after myomectomy. The main factors associated with fertility after myomectomy were age, duration of infertility, hysterosalpingography results and spousal spermogram results. Even if the myoma-infertility relationship is not clearly demonstrated, according to our results and taking into account the difficulty of access to MAP, it seems to us legitimate to propose myomectomy to patients presenting with infertility associated with myomas, especially in patients under 35 years old. A larger study would better establish the impact of myomectomy on the subsequent fertility of patients.

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## Compliance with ethical standards

### *Acknowledgments*

We would like to thank the head of the department of Gynecology and Obstetrics of Yalgado Ouedraogo University Hospital Center for allowing us to carry out the study.

### *Disclosure of conflict of interest*

The authors declare that they have no competing interests.

### *Statement of informed consent*

consent was obtained from participants. Participants were allowed to leave the survey at any time they desired. Confidentiality of information was assured, and the survey was anonymous.

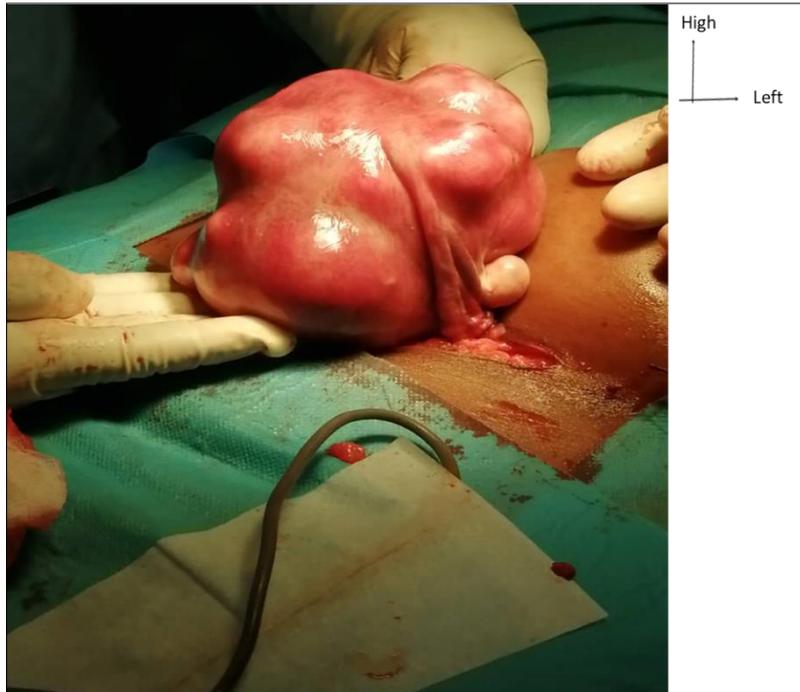
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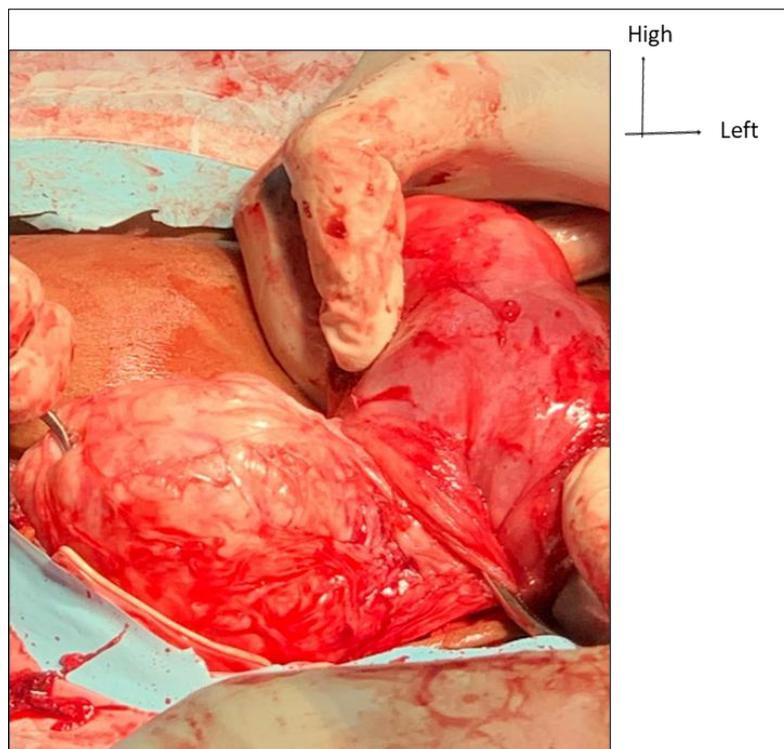
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**Appendix**



**Figure 2** Appearance of a polomyomatous uterus in a 32 - year - old patient in the Department of Gynecology-Obstetrics of the Yalgado Ouedraogo University Hospital Center.



**Figure 3** Surgical enucleation of a myoma in a 32-year-old patient in the Department of Gynecology-Obstetrics of the Yalgado Ouedraogo University Hospital Center



**Figure 4** Appearance of myomas after surgery