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A 7-Year Review of Abdominal Myomectomy for Infertile Women in Delta State: Fertility and Obstetric Outcomes

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Abstract:

BACKGROUND: Laparoscopic myomectomy for removal of uterine fibroid in resource-limited settings is cost prohibitive. Open abdominal myomectomy is unarguably more affordable, despite the drawbacks.

OBJECTIVE: The study aimed to determine fertility and obstetric outcomes after an open abdominal myomectomy.

MATERIALS AND METHODS: A retrospective descriptive study that involved the retrieval of medical records, and analysis of the data of women who had open abdominal myomectomy due to uterine fibroid and unexplained infertility, in a private health facility in Abraka, Delta State, Nigeria, from 1 February 2014 to 31 January 2021. The age, duration of infertility, location of fibroid masses within the uterus, history of previous pregnancy, pregnancy after myomectomy, pregnancy outcome and amongst other variables were captured and analysed using IBM SPSS version 23.

RESULTS: The data for 69 (88.5%) out of the 78 patients who had myomectomy was available for analysis. The mean age of patients was 33.3 ± 4.7 years; about 2/3 (65.5%) of the patients were ≤30 years. The pregnancy rate after myomectomy was 55.1% (38/69), most (44.9%) of the pregnancies occurred in the 1st year after myomectomy and about half (46.4%) of the patients were delivered by caesarean section. Patient's age, shorter duration of infertility and fewer fibroid masses were significantly associated with favourable fertility outcomes ($P < 0.001$, $P < 0.001$ and $P < 0.05$, respectively). Age ≤30 years was most predictive of pregnancy after myomectomy, $P < 0.017$.

CONCLUSION: The study showed that women with uterine fibroid and unexplained causes of infertility at age ≤30 years have good fertility and obstetric outcome after open abdominal myomectomy.

Keywords:

Fertility outcome, open abdominal myomectomy, uterine fibroid

Introduction

Fibroids are common in women of reproductive age and without symptoms in about half of the cases.[1] Indeed, many women with fibroids achieve successful reproductive careers, resulting in the debate on whether fibroids can affect fertility. However, it is clinically reasonable to suggest that there are instances when the role of fibroid in infertility can be less contentious, such as in intracavitary and submucous fibroids, or when fibroid distort the uterine cavity, impinges on both fallopian tubes and when they are simply numerous or very large.[2] The study most frequently cited to give credence to the epidemiological evidence of the associational role of fibroid in infertility is the review published by Buttram and Reiter.[3] In the review, fibroid was the only cause of infertility in 2.4% of the cases. In another published work,[4] fibroid was

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responsible for only 1% out of 339 laparotomies for infertility. If the causal role of fibroid in infertility can be established in controlled studies, the contentions surrounding fibroid and infertility may cease. Even this may not address issues surrounding variations in the number of fibroids, location, size and other undiagnosed contributing factors to infertility in patients.

The other debate is open myomectomy and laparoscopic myomectomy. While some studies conclude similar fertility outcomes,[5-7] larger studies are needed to draw undisputable conclusions. A clear challenge of laparoscopic surgery in resource-limited setting is affordability. Open abdominal myomectomy is more affordable with less technical support. Surgical success may be more likely in cases of large multiple intramural fibroid masses compared to laparoscopic myomectomy. This study aimed to determine the fertility and obstetric outcomes following open abdominal myomectomy in patients with uterine fibroid and unexplained infertility, in a private health facility at Abraka, in Delta State.

Materials and Methods

Study design

This was a retrospective descriptive study.

Setting

The study was conducted at a Private Health Facility, Wima Fertility Consult, located in a suburban University Community of the Delta State University (DELSU), Abraka, Delta State, Nigeria.

Study materials and data tool

This involved the analysis of the medical records of infertile women who had open abdominal myomectomies from 1 February 2014 to 31 January 2021. In keeping with the facility protocol for the management of patients with uterine fibroid and infertility, the patients had ultrasound confirmation of their fibroid masses and were subjected to basic infertility workup. This included a day-3 hormone assay to assess their ovarian reserve, hysterosalpingogram (HSG) for tubal patency and seminal fluid analysis to exclude male factor infertility. The patients whose diagnosis was uterine fibroid and unexplained infertility were selected for the study. Patients who had myomectomy for other indications were excluded from the study. Furthermore, excluded were patients whose partner's seminal profile was abnormal.

After surgery, all the patients were counselled and placed on barrier method of contraception for the first 2–3 months to allow for adequate myometrial healing. The follow-up period was for 2 years. Patients were advised to have unprotected sexual intercourse after 3 months of surgery without ovulation induction, and immediately present at the clinic if they missed their menstruation, for confirmation of pregnancy. Repeat HSG was done 6 months after surgery if no pregnancy was recorded, for early exclusion of tubal occlusion as a result of pelvic adhesion from surgery. The patients with at least one patent fallopian tube were subsequently placed on clomiphene citrate for ovulation induction and timed intercourse. All those who did not present in person for follow-up were contacted through their telephone number or that of their spouses, during the data capture. Information required during phone calls included the occurrence of conception after myomectomy and the time interval in months between surgery and pregnancy. Questions were also asked about the obstetric outcomes. The patient's age, duration of infertility, previous history of pregnancy by patients, number and distribution of fibroid masses, the time interval between myomectomy and pregnancy, the outcome of pregnancy and amongst other variables were retrieved from medical records of patients who presented for the scheduled follow-up period, for up to 2 years. Information captured was entered on the study proforma, which was subsequently transferred to a computer database for analysis.

Ethical consideration

Approval for the study was obtained from the DELSU Teaching Hospital Health Research Ethics Committee, with a research Approval number: HREC/PAN/2021/053/0439.

Data analysis

This was by SPSS version 23.0 (IBM Inc, Chicago, IL, USA). The dataset was presented in frequencies and percentages. The statistical association between categorical variables was subjected to Chi-square and Fisher's exact test. Variables that were significant in bivariate analysis were subjected to multivariate logistic regression. The level of significance was set at a $P < 0.05$.

Results

During the study period of 7 years, a total of 1263 patients, including referrals from other private health facilities, were evaluated for infertility from various causes: out of this number of patients, 6.2% (78/1263) had abdominal myomectomy performed on them as a result of unexplained infertility and uterine fibroid. About 12% (9/78) were lost to follow-up and could not be reached on telephone. Data for 88.5% (69/78) patients were available for analysis.

Shown in Table 1 are the sociodemographic and clinical characteristics of patients. The mean age of patients was 33.3 ± 4.7 years; about 2/3 (65.5%) of the patients

were ≤ 30 years. The duration of infertility ranged from 1 to 4 years in 68.1% of the patients. The factors responsible for delays before presentation at the clinic included ignorance about factors responsible for infertility, religious sentiments and patronage of alternative health practitioners. The majority (76.8%) of the patients have had previously confirmed pregnancies in the past, and this was considered a favourable predictor of future fertility. In 53.6% (37/69) of the patients, fibroid masses were in the three layers of the uterus. Moreover, there were more than five fibroid masses in 82.6% of the patients. Post-myomectomy, four patients had adhesiolysis performed on them for uterine synechiae.

The majority (85.5%) of patients performed pre-myomectomy HSG. Cannulation of the cervix was unsuccessful in 6 cases, while 4 declined HSG, on account of perceived pain from the procedure, 71.1% (42/59) of the patients had at least 1 patent tube before surgery, post-myomectomy HSG performed 6 months after surgery in patients who did not achieve pregnancy showed that 71.8% (24/39) had at least 1 patent tube [Table 2].

Following myomectomy, 55.1% (95% confidence interval [CI] = 43.3%–66.4%) of the patients became pregnant. Most (44.9%) of the pregnancies occurred within the 1st year. The mean time from surgery to pregnancy was 6.21 ± 1.06 months. Only 11.6% of the patients became pregnant after 1 year of surgery for up to 2 years of follow-up. Over half (50.7%) of the patients carried their pregnancies to term and had a live birth. In 46.4% of the patients, delivery was by caesarean section. This was largely on account of the increased risk of uterine rupture, especially in patients with submucous fibroid who had their endometrium breached. Five out of the eight women who got pregnant after the 1st year had vaginal deliveries [Table 3].

There was a significant association between pregnancy after myomectomy and the younger age of patients at the surgery, shorter duration of unexplained infertility before surgery and fewer fibroid masses at surgery [Table 4].

Following multivariate logistic regression, the only variable that predicted pregnancy after myomectomy was age ≤30 years, $P < 0.017$ (adjusted odds ratio of 15, 95% CI 1.61–139.60) [Table 5]. The test statistics from Hosmer–Lemeshow goodness ($\chi^2 = 0.405$; $P = 0.493$) shows a good fit of the logistic regression model.

Discussion

This study aimed to determine the fertility and obstetric outcomes of patients after open abdominal myomectomy. It was a facility-based review of the medical records of patients who had open abdominal myomectomy as a result of uterine fibroid and unexplained infertility. The study showed a clinical pregnancy rate of 55.1% after myomectomy. The factors that were favourably associated with pregnancy after open abdominal myomectomy, included younger age of patients at surgery, shorter duration of infertility and fewer fibroid masses. This study also demonstrated a peak pregnancy rate after myomectomy to be the 1st year after surgery. There was a satisfactory pregnancy outcome for both mother and the foetus.

In this study, the clinical pregnancy rate of 55.1% (38/69) was lower than 88% in a retrospective study carried out in Portharcourt.[8] In a review of pregnancy after hysteroscopic and laparoscopic/abdominal myomectomy, Donnez and Jadoul documented a rate between 45% and 49%.[9] Other recent works have supported these figures.[10-14] Pregnancy rates as high as 61% and 54% were documented after myomectomy, amongst patients with unexplained infertility, and in women in which other causes of infertility were excluded, respectively.[15,16] The differences in pregnancy rates post-myomectomy may be attributed to patients'

Table 1: Sociodemographic, clinical characteristics and intraoperative findings in patients (*n*=69)

	Frequency (%)
Age (years)	
20–25	2 (2.9)
26–30	19 (27.5)
31–35	24 (34.8)
36–40	20 (29.0)
>40	4 (5.8)
Duration of infertility (years)	
1–2	19 (27.5)
3–4	28 (40.6)
5 and above	22 (31.9)
History of previously confirmed pregnancy	
Yes	53 (76.8)
No	16 (23.2)
Outcome of previous pregnancy	
Spontaneous miscarriage	11 (15.9)
Pregnancy terminated	21 (30.4)
Pre-term delivery	4 (5.8)
Term delivery	17 (24.6)
Operative findings	
Location of fibroid masses	
Intramural	7 (10.1)
Submucous	4 (5.8)
Subserous + intramural	21 (30.4)
All three layers of the uterus	37 (53.6)
Number of fibroid masses	
1–5	12 (17.4)
6–10	30 (43.5)
11–15	12 (17.4)
>15	15 (21.7)

selection, study design, sample size and the surgical skill of the surgeon.

The majority (65.5%) of the patients were 30 years and below. This was comparable, but lower than the 35 years who made up 95.5% of patients in a retrospective study in Port Harcourt by Orazulike and Uzoigwe.[8] The age of patients in these studies represented the period fibroid growth was most prevalent in women of reproductive age.[17] Age was also an important factor impacting fertility outcomes after myomectomy.[18] Studies have shown that patients aged <35 years were more likely to achieve conception after myomectomy compared to women ≥35 years.[18,19]

Table 2: Frequency distribution of pre- and post-myomectomy hysterosalpingogram findings (*n*=69)

	Frequency (%)
HSG before myomectomy	
Declined	4 (5.8)
Unsuccessful	6 (8.7)
Yes	59 (85.5)
Results of pre-myomectomy HSG	
Patent tubes bilaterally	17 (28.8)
Single tube patent	25 (42.4)
Both tubes blocked	17 (28.8)
HSG 6 months after myomectomy	
Yes	39 (56.5)
No	30 (43.5)
Result of HSG after myomectomy	
Patent tubes bilaterally	11 (28.2)
Single tube patent	13 (33.3)
Both tubes blocked	15 (38.5)
Total	39 (100.0)

HSG: Hysterosalpingogram

Table 3: Frequency distribution of myomectomy outcome, time interval to pregnancy and mode of delivery

	Frequency (%)
Pregnancy after myomectomy	
Yes	38 (55.1)
No	31 (44.9)
The time interval between surgery and pregnancy	
Nil	30 (43.5)
<6 months	16 (23.2)
7–12 months	15 (21.7)
13–24 months	8 (11.6)
Pregnancy outcome	
Nil	29 (42.0)
Pre-term delivery	2 (2.9)
Spontaneous miscarriage	3 (4.3)
Carried to term	35 (50.7)
Mode of delivery	
Nil	32 (46.4)
Caesarean section	32 (46.4)
Spontaneous vaginal delivery	5 (7.2)

In this study, the patients who had fewer (≤5) fibroid masses, which implied fewer uterine incisions were more likely (P = 0.049), to be pregnant post-myomectomy compared to those with > 5 fibroid masses. In a study by Jeldu *et al.*,[18] participants who had more than 2 fibroid masses had a reduced chance of conception. It could be argued, therefore, that patients with fewer fibroid masses and unexplained infertility if given more time, may achieve spontaneous pregnancy, but such conception may be associated with a risk of fibroid-induced miscarriage if such masses are submucous or intracavitary.[2]

Study population and surgical technique may be the probable explanation for the difference in the number of incisions and impact on fertility post-myomectomy in studies.[18,19] Clinically, increased surgical incisions were associated with an increased risk of adhesions and tubal obstruction.[20]

Most (44.9%) of the pregnancies that occurred after myomectomy in this study were within the 1st year. In a systematic review,[21] the meantime from myomectomy to pregnancy was 18 months; patients' selection may account for the mean time of 6 months in this study: the cohort of patients was young and many with previously established fertility. Thus, it could be argued that many of the patients may have gotten pregnant in future if surgery was delayed.

The ideal time interval after myomectomy for pregnancy to avoid uterine rupture is contentious. A study recommended contraception for the first 6–24 months after myomectomy for fear of uterine rupture in pregnancy.[22] There was no uterine rupture in any of the patients operated upon in this cohort of women, despite some of the early pregnancies that were documented. It was reported in a study[22] that the average time interval between myomectomy and a live birth group was much shorter than in the non-live group. It may, therefore, be inferred that reproductive outcomes may be better a few months after myomectomy. Uterine rupture after myomectomy may be related to intracorporal tissue damage from electrocautery and poor suturing technique.[22-24] Electrocautery was not used for any of the patients operated upon in this study. Magnetic resonance imaging for the study of uterine wound healing suggests that the process of healing after myomectomy was completed 12 weeks after surgery, in the absence of haematoma and oedema formation.[25,26] Based on these findings, it may be safe to advise patients to commence unprotected coital exposure 3 months after abdominal myomectomy.

Table 4: Frequency distribution of association between the patient's age, location of the fibroid, number of fibroids, duration of infertility and achievement of pregnancy after myomectomy

	Pregnancy after myomectomy		χ^2	*P*
	Yes	No		
Age				
20–25	2 (100.0)	0	25.467	<0.001†
26–30	18 (94.7)	1 (5.3)		
31–35	12 (50.0)	12 (50.0)		
36–40	4 (20.0)	16 (80.0)		
>40	2 (50.0)	2 (50.0)		
Duration of infertility				
1–2	18 (94.7)	1 (5.3)	24.230	<0.001
3–4	16 (57.1)	12 (42.9)		
5 and above	4 (18.2)	18 (81.8)		
Location of fibroid masses				
Intramural	5 (71.4)	2 (28.6)	4.437	0.202†
Submucous	3 (75.0)	1 (25.0)		
Subserous + intramural	14 (66.7)	7 (33.3)		
All three	16 (43.2)	21 (56.8)		
Number of fibroid masses				
1–5	10 (83.3)	2 (16.7)	7.837	0.049
6–10	18 (60.0)	12 (40.0)		
11–15	4 (33.3)	8 (66.7)		
>15	6 (40.0)	9 (60.0)		
Previously confirmed pregnancy				
Yes	31 (58.5)	22 (41.5)	1.079	0.299
No	7 (43.8)	9 (56.3)		
HSG before myomectomy				
Declined	3 (75.0)	1 (25.0)	1.239	0.592†
Unsuccessful	1 (33.3)	2 (66.7)		
Yes	34 (54.8)	28 (45.2)		

†Fisher's exact test. HSG: Hysterosalpingogram

Table 5: Multivariate logistic regression associating age, number of fibroids and duration of infertility with pregnancy achievement after myomectomy

	P	AOR	95% CI for AOR
Age group			
≤30	0.017	15.00	1.61–139.60
>30		1.00	
The number of fibroid masses			
1–10	0.146	2.46	0.73–8.31
>10		1.00	
Duration of infertility			
1–2	0.092	7.18	0.73–70.92
>2		1.00	

Hosmer–Lemeshow goodness of fit (χ^2=0.405, *P*=0.493). AOR: Adjusted odds ratio, CI: Confidence interval

The association between the patient's age, duration of infertility, location of fibroid masses, previously confirmed pregnancy and pregnancy following myomectomy does not show a consistent pattern in predicting pregnancy in the literature.[8,9] Age of patients ≤30 years was the most important predictor of pregnancy post-myomectomy in this study. This finding was similar to the average age of 30.0 ± 3.7 years, with higher pregnancy after myomectomy in a study conducted in China.[22]

The fertility and obstetric outcome following myomectomy are generally considered satisfactory.[8,22,23,25] All the term pregnancies had live births. They were mostly delivered by caesarean section due to perceived scar weakness because of the short interval between surgery and pregnancy, thus making the uterus susceptible to rupture during labour.

The strength of this study stems from the fact that all the surgical procedures were carried out by the same surgeon under the same pre-operative and post-operative conditions.

The limitations included the small sample size, which made the generalisation of the findings from the study difficult. It is also pertinent to state that the study design, which was retrospective and descriptive, imposed a limitation on the causal role of fibroid in the infertility of these patients. Incomplete data contributed to the weakness of this study, as data from 11.5% of the patients who had myomectomies were excluded from the

analysis because the patients were lost to follow-up. The follow-up period for the study was 2 years, consequently, patients who got pregnant thereafter were not accounted for.

Conclusion

This study set out to determine the fertility and obstetric outcomes after open abdominal myomectomy. The findings showed that women with unexplained infertility and uterine fibroid at age ≤30 years have good fertility and obstetric outcome after open abdominal myomectomy. A multicentre prospective study involving a larger sample size with randomisation of patients with uterine fibroid and infertility for myomectomy versus conservative management of fibroid is recommended.

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Conflicts of interest

There are no conflicts of interest.

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