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Review of the Clinical Presentation of Uterine Fibroid and the Effect of Therapeutic Intervention on Fertility

Atombosoba. A. Ekine[1], Lucky O. Lawani[2,*], Chukwuemeka A. Iyoke[3], Israel Jeremiah[1], Isa. A. Ibrahim[1]

[1]Department of Obstetrics & Gynecology, Niger Delta University Teaching Hospital, Okolobiri, Bayelsa State, Nigeria
[2]School of Post Graduate Studies, Department of Community Medicine, University of Nigeria, Enugu, Enugu State, Nigeria
[3]Department of Obstetrics & Gynecology, University of Nigeria Teaching Hospital, Enugu, Enugu State, Nigeria
*Corresponding author: Lawkins2000@yahoo.com

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Abstract Uterine fibroid is a common gynecological problem among women of reproductive age. The objective of this study was to review the common clinical presentation of uterine fibroid and assess the effect of therapeutic intervention on fertility. A retrospective descriptive study of 368 women, who were managed for uterine fibroid over a 5 years period (January 1st, 2008 to December 31st, 2012) was conducted at a University Teaching Hospital. The main outcome measures were common presentations, effect of treatment on fertility. Data were analyzed with Epi Info™ statistical software version 7.0. The incidence of uterine fibroids was 29.3%. Fibroids mainly affected those in the reproductive age group (31-40 years). The common clinical presentations- were abdominopelvic mass (100%), menorrhagia (95.7%), infertility (41.9%), anemia (32.9%), dysmenorrhoea (12.5%), abdominopelvic pain (15.8%), and urinary pressure symptoms (6.8%). Abdominal myomectomy (97.3%) was the main stay of treatment. The Odd Ratio of achieving pregnancy within two year of therapeutic intervention was 1.33 (0.27-6.60), p-value=0.0007, while the risk ratio of recurrent pregnancy loss was about three times less in those who had therapeutic interventions [3.56 (0.52-24.21)], p-value=0.11. Uterine fibroid presents with abnormal uterine bleeding and impaired fertility in women of reproductive age, and removal conferred fertility benefits in some cases.

Keywords: *uterine fibroid, pregnancy, menorrhagia, clinical presentation, fertility, myomectomy*

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1. Introduction

Uterine fibroid is a common gynecological problem among women of reproductive age, and there are conflicting reports of its effect on fertility and pregnancy outcome. It is a common reason for gynecological consultation in most Nigerian hospitals [1,2,3,4], as well as the most common benign genital tract tumor which are associated with sub-fertility and early pregnancy loss in women of reproductive age [1,2,5,6]. According to a 2010 World Health Organization report, fibroids affects between 20 – 25% of women, and close to 235 million women which represent 6.6% of global women population are estimated to have been affected worldwide [7,8].

Uterine fibroids are commoner among Black women than Caucasians [9], the incidence in Nigeria ranges from 17.9- 26%, as against 5-11% reported in Europe and United States [10,11,12]. Studies have reported a life incidence of between 20-40% and 35-60% of women population at risk of having either symptomatic or asymptomatic uterine fibroid which may require treatment or no intervention [8,13,14]. These symptoms can adversely affect the quality of life, especially for those residing in middle and low income countries where late presentation to hospital is a common occurrence [15].

The majority of women with uterine fibroids are generally asymptomatic at the early stage and consequently get less clinical attention due to undiagnosed disease [1,16], while symptomatic women typically complain of abdominopelvic mass with or without abnormal uterine bleeding- mainly menorrhagia [1,2,3]. Studies have shown that women with myomas are more likely to present with abdominal mass and menorrhagia [1,3,4,17,18,19,20], and may also present with dyspareunia, dysmenorrhoea, abdominal discomfort or bloating, painful defecation, back ache, urinary frequency or retention, and infertility [1,4,18,19,20]. During pregnancy, fibroids may be a cause of miscarriage, bleeding, abnormal lie and presentation [13].

An association between myomas and fertility has been observed but the responsibility of fibroids in infertility remains unclear and debatable [21]. At present, it is estimated that fibroids may be associated with infertility in 5 to 10% and are possibly the sole cause of infertility in 1 to 3% [3,4,21,23-29]. The location of fibroids is implicated to play a role in infertility and miscarriages, with intramural and submucous locations identified as major risk. Sub mucous fibroids are believed to interfere

with the function of the uterine lining and the ability of a fertilized ovum to implant [23,29]. It is also postulated that larger fibroids may distort or block the fallopian tubes [22,23,29].

In view of the variation in reports and expert opinion on the clinical presentation of uterine fibroids and its effect on fertility and pregnancy outcome, this study was designed to retrospectively review the common clinical presentation, the effect of fibroids and its treatment on the fertility of women of the Niger Delta region of south-south, Nigeria.

2. Materials and Methods

This is a retrospective descriptive study of women managed for uterine fibroids over a 5 year period (1st January, 2008 to 31st December, 2012) in the department of obstetrics and gynecology at the Niger Delta University Teaching Hospital, Okolobiri, Bayelsa State, Nigeria. During the period under review, a total of 1,256 gynecological cases were seen, 386 of them were managed for uterine fibroid. The medical records of all 386 cases of uterine fibroids managed during the period were retrieved from the hospital medical record department and retrospectively reviewed by four research assistants. Of the 386 cases, 154 had uterine fibroids coexisting infertility- 142 of these were unexplained infertility.

Inclusion criteria were- women with leiomyoma uteri within the reproductive age (15-49 years), women with fibroid and subfertility with no other significant infertility factors, women who had fibroid and miscarriage with histo-pathological analysis on expelled products of conception (to rule out other causes of miscarriage). Exclusion criteria include- infertile women managed with assisted reproductive technology, women with miscarriages due to causes other than uterine fibroids.

Eighteen women with incomplete records and documentation were excluded from the study, leaving the data of 368 women suitable for analysis. Information was retrieved from the patients' medical case notes, gynecological ward records, histopathology records, emergency and gynecological theatre records- data on socio-demographics characteristics of the participants, clinical presentation, clinical and histopathology diagnosis, effect of fibroids on fertility before and after treatment, and type of treatment intervention received were abstracted using a data entry pro forma. The main outcome measures were common clinical presentation of uterine fibroid, clinical pregnancy and spontaneous abortion rates before and after therapeutic interventions.

Data were analyzed with Epi Info™, version 7 (Centers for Disease Control and Prevention, Atlanta, GA, USA). The process involved the determination of simple percentages, mean and inferential statistics involving Odds Ratio (OR) and Risk ratio (RR). Test of statistical significance was by Fisher Exact test, *P*-value <0.05 at 95% Confidence Interval (CI) was considered statistically significant.

3. Results

The 386 cases of uterine fibroid constituted 29.3% of all gynecological cases managed during the period under review. The mean age of the women was 34.0 ± 6.2 years with their age distribution and other socio-demographic characteristics shown in Table 1. Fibroid was commonest in unmarried (193; 52.5%), nulliparous women (114; 31.0%), aged 31-40 years (301; 81.8%).

Table 1. Socio-demographic characteristics of participants, N = 368

Characteristics	N (%)
Age (years)	
20-30	23 (6.2)
31-40	301 (81.8)
41-50	44 (12)
Educational status	
None	32 (8.7)
Primary	232 (63.0)
Secondary	96 (26.1)
Tertiary	8 (2.2)
Marital status	
Married	166 (45.1)
Single	193 (52.5)
Separated	6 (1.6)
Divorced	3 (0.8)
Religion	
Christianity	341 (92.7)
African traditional religion	25 (6.8)
Islam	2 (0.5)
Parity	
0	114 (31.0)
1-4	254 (69.0)

Table 2. Clinical presentation of fibroids and surgical interventions, N=368

Variables	n (%)
† Clinical presentation	
Menorrhagia	352 (95.7)
Dysmenorrhia	46 (12.5)
Anemia	121 (32.9)
Abdominopelvic pain	58 (15.8)
Abdominopelvic mass	368 (100)
Urinary pressure symptoms	65 (6.8)
Gastrointestinal pressure symptoms	12 (3.3)
Weight loss	21 (5.7)
Unexplained recurrent miscarriage	34 (9.2)
Infertility	154 (41.9)
Abnormal vaginal discharge	2 (0.5)
Duration of symptoms	
≤ 2 years	82 (22.3)
>2years	286 (77.7)
Type of surgery, N=338	
Vaginal Myomectomy	2 (0.6)
Abdominal Myomectomy	329 (97.3)
Total abdominal Hysterectomy	7(2.1)

Table 2 showing the major clinical presentations or symptoms of the patients indicates that abdominopelvic mass (368; 100%) and menorrhagia (352; 95.7%) were the commonest clinical presentation of fibroids. Abdominal mass in the participants ranged between 12-26 weeks

uterine size. Anemia (121; 32.9%) due to menorrhagia was also a common presentation, while other presentations were- dysmenorrhoea (46; 12.5%), abdominopelvic pain (58; 15.8%), weight loss (21; 5.7%), unexplained recurrent miscarriages (34; 9.2%), urinary (25; 6.8%) and gastrointestinal pressure symptoms (12; 3.3%).

One hundred and fifty-four (41.9%) participants presented with a history of infertility coexisting with uterine fibroids- they all had intramural (100; 64.9%) and submucous fibroids (54; 35.1%). Fertility work up showed that 142 couples had infertility with no known cause (unexplained infertility). The 12 cases with known causes were due to male factors (eight) and ovulatory factors (four). Majority (114) of the infertility were primary, while 40 were secondary.

A total of 338 (91.9%) patients had surgical intervention to treatment their myoma- 7 (2.1%) patients had abdominal hysterectomy, while 0.6% and 97.3% of the participant's had vaginal and abdominal myomectomy respectively (Table 2). The histology report of the samples of all 368 patients indicated that there were no malignant changes, while degenerative changes were common- Hyaline changes (64.2%), red degeneration (31.3%) and calcification (4.5%).

Following treatment, 33 (25%) of the 132 women with unexplained infertility achieved conception within two years of surgical treatment with myomectomy, while only 2 (20%) out of the 10 who had non-surgical conservative management achieved conception during the same period. The Odd ratio of achieving conception following treatment was 1.33 (0.27-6.60), p-value=0.0007- statistically significant at 95% confidence interval (Table 3), while the risk ratio of having recurrent miscarriages was more than three times higher in those who did not have any surgical intervention [3.56 (0.52-24.21)]- (Table 4).

Table 3. Odd ratio of pregnancy within two year of myomectomy and non-surgical management in couples with unexplained infertility co-existing with fibroids, N=142

Variables	Pregnancy n (%)	No pregnancy n (%)	Odd ratio (95% confidence interval)	*P*-Value
Myomectomy, N=132	33 (25)	99 (75)		
Non-surgical conservative management, N=10	2 (20)	8 (80)		
			1.33 (0.27-6.60)	0.0007*

*Statistically significant.

Table 4. Risk ratio of unexplained recurrent miscarriages before and after therapeutic intervention in women with fibroids and infertility, N=154

Variables	Occurrence of recurrent Miscarriage n (%)	Non-occurrence of recurrent miscarriage n (%)	Relative risk (95% confidence interval)	*P*-Value
Before therapeutic interventions, N=139	33 (23.7)	106 (76.3)		
After therapeutic interventions, N=15	1 (6.7)	14 (93.3)		
			3.56 (0.52-24.21)	0.11

4. Discussion

This study found that uterine fibroid is a common gynecological condition among young women of reproductive age and was associated with distressing and life threatening symptoms. It also showed that fertility and the chances of sustaining a viable pregnancy could be improved with therapeutic interventions in selected women who had co-existing unexplained infertility.

Compared to Caucasians, Negroid women are reported to have a higher incidence of uterine fibroid age for age [15]. The incidence of uterine fibroid in this study (29.3%) was similar to the 25.9% reported in Enugu, and higher than the 11% reported in Caucasian women [12,19]. The high incidence among Nigerian women may be associated with race and genetic factors, which have been implicated as risk factors by several studies which reported higher incidence in black women and women of African descent [1,25,31,32,33,34].

Uterine fibroids are reportedly commoner amongst young nulliparous women within the reproductive age of 15-49 years- consistent with the findings from this study, where over one-third of the participants were nulliparous and over 3/4 were within the reproductive age group of 31-40 years [1,2,4,17,35,36]. "It is generally believed that most uteruses that fails to carry a baby, is bound to harbor fibroids". This may be due to the prolonged effect of estrogen on the uterine smooth muscle [14,15].

The majority (77.7%) of the participants in this study presented late for treatment- after two years of onset of symptoms, with huge fibroids which ranged between 12-26 weeks uterine size. This is a common occurrence in most Nigerian settings, where symptomatic patients prefer to initially sought treatment from un-orthodox sources, before seeking orthodox treatment after failed attempts. This is similar to the findings in Lagos, where the fear of complications of surgery prevented some patients with myoma from seeking orthodox treatment, until the fibroids become advanced or associated with complications [37].

Abnormal uterine bleeding in the form of menorrhagia- seen in 95.7% of the participants in this study is a common clinical presentation in women with uterine fibroids [1,3,4,18,19,20,21]. Menorrhagia in severe cases may result in anemia, which was noted in 32.9% of participant- consistent with the findings of other researchers [36]. However, the incidence of menorrhagia was higher in this study, compared to reports from Ile-Ife, Lagos and Ilorin- 47.7% and 64.3% [3,4].

Abdominopelvic mass was the commonest clinical presentation (100%) in this study- higher than but consistent as the commonest presentation in Maiduguri (63.7%), Nnewi (66.9%) and Enugu (70.5%) [1,2,29]. The other symptoms reported by women in this study-

dysmenorrhia, abdominopelvic pain, pressure symptoms and recurrent pregnancy loss are often distressing and have been shown to adversely affect the patients quality of life both physically and psychologically [1,4,18,19,20,21,28,36].

This study found that uterine fibroids could undergo degenerative changes like hyaline change, calcification and red degeneration- a significant cause of abdominal pain in pregnant women with co-existing fibroids. These findings were consistent with those of other researchers [12].

Analysis of the clinical presentation indicates that problems relating to sub-fertility with or without other symptoms were a significant part of the morbidity suffered by the participants. There is a well recognized association between uterine fibroid and infertility, however the actual contribution of fibroid in infertility remains controversial [21,25,28,31,38]. However, fibroids are found in 1% to 2.4% of women with unexplained infertility [39]. Despite the fact that evidence on the effect of fibroids on reproductive performance of women may be inconclusive, the results from this study showed that about one-third of participants who had unexplained infertility coexisting with uterine fibroids achieved conception within two years of therapeutic intervention- this finding coupled with the findings of other investigators are indications that in well selected cases, there is the chance of improved fertility and enhanced reproductive outcome in cases of unexplained infertility coexisting with fibroids [39-48].

The role of fibroids in miscarriages has also remained controversial, given the wide variation in reported data- 32.3% by Emembolu, 10.3% by Adesiyun and 1% by Ezeama [1,20,27]. Despite these variations, the possible role of fibroid in miscarriages was strengthened by the findings of this study, where 9.2% of the patients had at least two or more spontaneous miscarriages- consistent with the findings by Connolly et al in Dublin [41]. There was also more than a 3-fold reduction in this risk after therapeutic intervention

Myomectomy is indicated in symptomatic women who wish to preserve their reproductive function. This may be performed by hysteroscopy, laparoscopy, or laparotomy- depending to their size, location, number, and the experience of the surgeon [44]. Abdominal myomectomy was the commonest (97.3%) surgical intervention performed in this study- similar to the findings in most Nigerian settings [2,3,19,35]. This is owing to the multiple nature and huge sizes of the fibroid masses which correlates with late presentations in our setting. This makes the application of newer therapies like laparoscopic myomectomy difficult even when they are available. Other modern therapies and technologies which are independent of the fibroid size- like uterine artery embolization are not readily available, making myomectomy an important treatment modality in our environment [1].

Most studies in western countries have reported successful pregnancy rates ranging between 33-69.9% following treatment of fibroids with myomectomy [39-48] - greater than the 25% recorded in the present study. This wide gap in fertility outcome emphasizes the need to review surgical techniques and improve patient selection in low resource settings like Nigeria, where myomectomy is the most commonly performed surgical treatment modality for fibroids. However, other studies showed no evidence for a significant effect of myomectomy on the clinical pregnancy rate for uterine fibroids. Similarly, there was no evidence for a significant effect of myomectomy on miscarriage rate [49]. In the present study, the pregnancy rate of 25% vs 20% in participants that had myomectomy and non-surgical treatment respectively is an indication that myomectomy provides greater benefits than non-surgical treatment in improving fertility in women with these pathology.

In the present study, symptomatic uterine fibroid was found to have negative impact on women's health. Evidence from this review indicates that subfertility was a common finding in women with uterine fibroids, and that treatment confers some improvement on reproductive potential of women who had fibroids coexisting with unexplained infertility. Based on these findings which are consistent with those of other researchers [41-48], we recommend the treatment of fibroids in women with coexisting infertility and the need to conduct larger, prospective, randomized controlled trials, to better define possible associations of improved reproductive outcome following treatment of myoma in women with unexplained infertility.

References

[1] Ezeama C, Ikechebelu J, Obiechina N, Ezeama N: Clinical Presentation of Uterine Fibroids in Nnewi, Nigeria: A 5-year Review. Ann Med Health Sci Res 2012, 2: 114-118.

[2] Okeke TC, Okezie OA, Obioha KC, Ikeako LC, Ezenyeaku CC: Trends of myomectomy at the University of Nigeria Teaching Hospital (UNTH) Enugu Nigeria. Niger J Med 2011, 20: 224-227.

[3] Okogbo FO, Ezechi OC, Loto OM, Ezeobi PM: Uterine Leiomyomata in South Western Nigeria: a clinical study of presentations and management outcome. Afr Health Sci 2011, 11: 271-278.

[4] Aboyeji AP, Ijaiya MA: Uterine fibroids: a ten-year clinical review in Ilorin, Nigeria. Niger J Med 2002, 11: 16-19.

[5] Akinyemi BO, Adewoye BR, Fakoya TA: Uterine fibroid: a review. Niger J Med 2004, 13: 318-329.

[6] Ben-Nagi, J., et al. "Endometrial implantation factors in women with submucous uterine fibroids." Reprod.Biomed.Online. 21.5 (2010): 610-15.

[7] Crum A. The Next Century- Advances in Uterine Leiomyoma. Environ Health Perspec. 1999, 108 (5).

[8] Borgfeldt C, Andolf E. Transvaginal ultrasonographic findings in the uterus and the endometrium: low prevalence of leiomyoma in a random sample of women age 25-40 years. Acta Obstet Gynecol Scand. 2000; 79(3):202-207.

[9] Ogunniyi SO, Fasubaa O. Uterine fibromata in Ilesha, Nigeria. Nig. Med Pract 1990; 19:93-95.

[10] Sagay S, Udoeyop EU, Pam C, Karshina JA, Daru PH, Otubu JAM (1998): Laparoscopic evaluation of 1000 consecutive infertile women in Jos Nigeria. Tropical Journal of Obstetrics and Gynaecology;15(1): 30-35.

[11] Vollenhoven BJ, Lawrence AS and Healey DC (1990). Uterine fibroid: a clinical review. British Journal of Obstetrics and Gynaecology 1990: 97: 285-98.

[12] Ogedengbe OK (2003). Uterine Fibroids In: Contemporary obstetrics and gynaecology for developing countries. Okonofua. F and Odunsi K (Ed) Intec printers limited Ibadan. Pg 202-213.

[13] Laughlin SK, Baird DD, Savitz DA, Herring AH, Hartmann KE. Prevalence of uterine leiomyomas in the first trimester of pregnancy: an ultrasound-screening study. Obstet Gynecol. 2009;113(3):630-635

[14] Baird DD, Dunson DB, Hill MC, Cousins D, Schectman JM. High cumulative incidence of uterine leiomyoma in black and white women: ultrasound evidence. Am J Obstet Gynecol. 2003; 188(1):100-107.

[15] Merrill RM. Hysterectomy surveillance in the United States, 1997 through 2005. Med Sci Monit. 2008; 14: CR24-CR31.

[16] Jindabanjerd, K; Taneepanichskul, S (2006). "The use of levonorgestrel - IUD in the treatment of uterine myoma in Thai women". Journal of the Medical Association of Thailand. 89 Suppl 4: S147-51. PMID 17726816.

[17] Okezie O, Ezegwui HU: Management of uterine fibroids in Enugu, Nigeria. J Obstet Gynaecol 2006, 26: 363-365.

[18] Sankaran, S.; Manyonda, I. (2008). "Medical management of fibroids". Best Practice & Research Clinical Obstetrics & Gynaecology 22 (4): 655.

[19] Ozumba BC, Megafu UC, Igwegbe AO: Uterine fibroids: clinical presentation and management in a Nigerian teaching hospital. Ir Med J 1992, 85: 158-159.

[20] Emembolu JO: Uterine fibromyomata: presentation and management in northern Nigeria. Int J Gynaecol Obstet 1987, 25: 413-416.

[21] Legendre, G., J. L. Brun, and H. Fernandez. "[The place of myomectomy in woman of reproductive age]." J.Gynecol.Obstet.Biol.Reprod.(Paris) 40.8 (2011): 875-84.

[22] Bendifallah, S., J. L. Brun, and H. Fernandez. "[Myomectomy for infertile women: the role of surgery]." J.Gynecol.Obstet.Biol.Reprod.(Paris) 40.8 (2011): 885-901.

[23] Ekwere PD, Archibong EI, Bassey EE, Ekabua JE, Ekanem EI, Feyi –Waboso P (2007). Infertility among Nigerian Couples as seen in Calabar, Port Harcourt Med. J. 2: 35-40.

[24] Olotu EJ, Osunwoke EA, Ugboma HA, Odu, KN. Age prevalence of uterine fibroids in south-southern Nigeria: A retrospective study. Scientific Research and Essay Vol.3 (9), pp. 457-459, September, 2008.

[25] Ezugwu EC, Iyoke CA, Ezugwu FO, Ugwu G: Successful pregnancy following myomectomy for giant uterine fibroid in an infertile woman. J Reprod Infertil 2014, 15: 233-236.

[26] Obed JY, Bako B, Kadas S, Usman JD, Kullima AA, Moruppa JY: The benefit of myomectomy in women aged 40 years and above: Experience in an urban teaching hospital in Nigeria. Niger Med J 2011, 52: 158-162.

[27] Adesiyun AG, Ojabo A, Durosinlorun-Mohammed A: Fertility and obstetric outcome after caesarean myomectomy. J Obstet Gynaecol 2008, 28: 710-712.

[28] Egwuatu VE: Fertility and fetal salvage among women with uterine leiomyomas in a Nigerian Teaching Hospital. Int J Fertil 1989, 34: 341-346.

[29] Geidam AD, Lawan ZM, Chama C, Bako BG: Indications and outcome of abdominal myomectomy in University of Maiduguri Teaching Hospital: Review of ten year. Niger Med J 2011, 52: 193-197.

[30] Parker WH. Etiology, symptomatology, and diagnosis of uterine myomas. Fertil Steril.2007; 87(4):725–36.

[31] Fields KR, Neinstein LS. Uterine myomas in adolescents: case reports and a review of the literature. J Pediatr Adolesc Gynecol. 1996; 9(4):195-198.

[32] Okolo S. Incidence, aetiology and epidemiology of uterine fibroids. Best practice & research. Clinical obstetrics & gynaecology 2008. 22 (4): 571-588.

[33] Elugwaraonu O, Okojie AIO, Okhia O, Oyadoghan GP. The Incidence of Uterine Fibroid Among Reproductive Age Women: A Five Year Review of Cases at ISTH, Irrua, Edo, Nigeria. International Journal of Basic, Applied and Innovative Research IJBAIR, 2013, 2(3): 55-60.

[34] Akinyemi BO, Adewoye BR, Fakoya TA: Uterine fibroid: a review. Niger J Med 2004, 13: 318-329.

[35] Omu AE, Ihejerika IJ, Tabowei G: Management of uterine fibroids at the University of Benin Teaching Hospital. Trop Doct 1984, 14: 82-85.

[36] Parker WH. Etiology, symptomatology, and diagnosis of uterine myomas. Fertil Steril. 2007; 87(4):725-36.

[37] Adegbesan-Omilabu MA, Okunade KS, Gbadegesin A: Knowledge of, Perception of, and Attitude towards Uterine Fibroids among Women with Fibroids in Lagos, Nigeria. *Scientifica (Cairo)* 2014, 2014: 809536.

[38] Adinma, J.I.B. Uterine fibroid and fertility in Enugu. *Nig. Med. J. 1999.* 5: 3-5.

[39] Vilos, G. A. "Uterine fibroids: relationships to reproduction." Minerva Ginecol. 55.5 (2003): 417-23.

[40] Chaker, A., et al. "[Uterine fibromyomas: fertility after myomectomy. About 41 cases]." Tunis Med. 82.12 (2004): 1075-81.

[41] Connolly, G., et al. "Fertility after abdominal myomectomy." J.Obstet.Gynaecol. 20.4 (2000): 418-20.

[42] Kasum, M. "Fertility following myomectomy." Acta Clin.Croat. 48.2 (2009): 137-43.

[43] Olive, D. L., S. R. Lindheim, and E. A. Pritts. "Non-surgical management of leiomyoma: impact on fertility." Curr.Opin.Obstet.Gynecol. 16.3 (2004): 239-43.

[44] Luciano, A. A. "Myomectomy." Clin.Obstet.Gynecol. 52.3 (2009): 362-71.

[45] Kably, Ambe A., et al. "[Abdominal myomectomy and subsequent fertility]." Ginecol.Obstet.Mex. 58 (1990): 274-76.

[46] Poncelet, C., et al. "[Myoma and infertility: analysis of the literature]." Gynecol.Obstet.Fertil. 29.6 (2001): 413-21.

[47] Smith, D. C. and J. K. Uhlir. "Myomectomy as a reproductive procedure." Am.J.Obstet.Gynecol. 162.6 (1990): 1476-79.

[48] Veliz, V. H. and G. Rosa. "[Myomectomy to preserve fertility]." Rev.Chil.Obstet.Ginecol. 59.1 (1994): 49-52.

[49] Metwally, M., Y. C. Cheong, and A. W. Horne. "Surgical treatment of fibroids for subfertility." Cochrane.Database.Syst.Rev. 11 (2012): CD003857.