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Research Article

Surgical Management of Uterine Fibroids at the Teaching Hospital of Angre Abidjan Cote d'Ivoire: 193 Cases Report

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Abstract

Objective: To evaluate the surgical management of myomas at the Teaching Hospital of Angré according to the *FIGO* (International Federation of Gynecology and Obstetrics) classification.

Patients and methods: This was a cross-sectional study at the Teaching Hospital of Angre from January 1, 2020, to December 31, 2022. Patients whose operative indication was clearly identified were included in the study. Incomplete files were not included. The variables studied were anthropometric parameters, clinical characteristics of myomas, and surgery. Due to the large size and multifocal location of uterine myomas, the therapeutic option remained surgery by laparotomy.

Results: Most patients were over 35 years old (71.5%) and nulliparous (52.8%). The first indication for surgery was menometrorrhagia (88.6%), followed by the desire for motherhood (37.8%) and dysmenorrhoea (20.2%) for myomas most often *FIGO* type 4 (p = 0.0031). Myomectomy under cervical-isthmic tourniquet was the most common procedure for *FIGO* type 4 myomas (66.1%; p = 0.0543). Hysterectomy was most frequently performed for *FIGO* type 7 myomas (43.9%; p = 0.0543). For myomectomy, the first complication was anaemia (3.5%) followed by uterine suture haemorrhage (1.7%) (p = 0.5139).

Conclusion: Our surgical practice at the Teaching Hospital of Angre is in accordance with *FIGO* recommendations. However, an effort should be made to promote the minimally invasive surgical approach (laparoscopic, hysteroscopic, transvaginal ablation) for small fibroids (≤ 5 cm) or *FIGO* type 0 to 3, which is not very frequent in our current practice.

More Information

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Keywords: Leiomyofibroma; Menometrorrhagia; Maternity desire; Myomectomy; Hysterectomy

Introduction

The fibroid or uterine myoma is the most common benign tumour in genitally active women [1]. More precisely, it is a leiomyofibroma consisting mainly of smooth muscle fibres. The fibroma is thought to be the reaction of the myometrium to local hyperoestrogenism. The action of oestrogens is via growth factors [2]. Thus the main factors favouring myomas are sub-Saharan origin, age ≥ 30 years, nulliparity, high body mass index (BMI), alcohol consumption, early menarche before the age of 12 years, late menopause after the age of 50 years, generic predisposition [3-7].

The symptomatology of myomas is dominated by menometrorrhagia. Diagnosis is made clinically and by ultrasound. Magnetic resonance imaging is indicated for better mapping of myomas [8]. Whatever the diagnostic method used, the classification of the International Federation of Gynaecology and Obstetrics (*FIGO*) allows the localisation of myomas to be standardised and management to be guided [9].

Once diagnosed, the myoma must be managed. This concerns 20% to 50% of clinically expressed myomas [2,10]. The management of myomas have nowadays benefited from several therapeutic means: radio frequency, uterine artery embolisation, drugs (progesterone, GnRH analogue), and surgery [11-13]. Surgery is still the most common treatment option in our practice setting.

The objective of the study was therefore to evaluate the surgical management of myomas at the Teaching Hospital of Angré.

Patients and methods

We conducted a single-centre cross-sectional analytical study at the Teaching Hospital of Angre. The study was conducted from January 1, 2020, to December 31, 2022, i.e. over a period of 3 years. The study population consisted of all patients who had undergone surgical treatment for myoma at the Teaching Hospital of Angre during the study period. Patients whose indication for surgery was clearly identified and who had actually undergone surgery at the Teaching Hospital of Angre were included in the study. Incomplete files were not included in the study. The variables studied were anthropometric parameters (age, parity, BMI), the clinical characteristics of the myomas summarised in the myoma map, and the characteristics of the surgery (indication, procedure, and postoperative follow-up). Due to the large size and multifocal location of the uterine myomas diagnosed at the Teaching Hospital of Angré, the therapeutic option remained surgery by laparotomy. Our study was carried out in strict compliance with the fundamental principles of the 1964 Declaration of Helsinki, amended by the 52nd General Assembly in October 2000. These principles applicable to all forms of medical research are:

- The principle of the interest and benefit of research: also, the results obtained will be made available to the scientific community
- The principle of the harmlessness of research
- Confidentiality: concerning the information collected during the survey and the anonymity of the participants in the results relating to this study

Results

Socio-demographic characteristics

During the study period, we identified 193 patients who had undergone surgical treatment for uterine fibroids. For the socio-demographic parameters, we were interested in age, parity, and BMI. Most of the patients were over 35 years of age (71.5%). In 26.4% of the cases, the patients were between 25 and 35 years of age. Most patients were nulliparous (52.8%). Multiparous women represented 7.8% of the patients. BMI was high in most patients (59.1%): overweight (BMI [14-19] in 45.1% and obese (BMI ≥ 30) in 14% of patients.

Clinical characteristics of myomas

The myomas were mapped according to the *FIGO* classification. It should be noted that the same patient often had several myomas in different locations. Thus the mapping of myomas was cross-referenced with the patient's BMI. Most of the overweight patients (74.7%) had *FIGO* type 4 myomas compared to 50% of patients with a BMI < 18 ($p = 0.17$). The results obtained are presented in Table 1.

The first indication for surgery was menometrorrhagia (88.6%), followed by maternity desire (37.8%) and dysmenorrhoea (20.2%). It should be noted that a patient could have several indications. The operative indications were cross-referenced with the myoma mapping. This is presented in Table 2. Thus, for these 3 indications, the myomas were most often *FIGO* type 4 with respectively 68.4%; 75.3%, and finally 76.9% ($p = 0.0031$).

Characteristics of the surgery

The approach for all patients in the study was laparotomy. Two surgical procedures were possible: myomectomy with or without placement of a cervical isthmic tourniquet and hysterectomy. The operative indications were cross-referenced with the surgical procedure. This is presented in Table 3. Myomectomy under cervical-isthmic tourniquet was the most performed procedure for maternity desire in 89.0% ($p = 0.0001$). Hysterectomy was most often performed for urinary, rectal, and venous compression, then for menometrorrhagia with respectively 48.5% and 35.7% ($p = 0.0001$).

The mapping of myomas guides the surgical treatment. Thus, we cross-referenced the myoma mapping with the type of surgery performed (Table 4). The results are presented in Table 4. Myomectomy under cervical-isthmic tourniquet was the most common procedure for *FIGO* type 4 myomas (66.1%; $p = 0.0543$). Hysterectomy was most frequently performed for *FIGO* type 7 myomas (43.9%; $p = 0.0543$).

We counted the postoperative follow-up immediately or within 48 hours after the surgery. The postoperative follow-up was simple or complicated. Complications included anaemia, uterine haemorrhage from the sutures, digestive or bladder wounds, pelvic abscess, and urinary tract infection. In most cases, the aftermath was simple (91.7%). The mapping of the myomas was cross-referenced with the operative follow-up (Table 5). *FIGO* type 3 myomas were more responsible for anaemia and *FIGO* type 7 myomas were more responsible for uterine suture haemorrhage (6.6% *vs.* 7%; $p = 0.947$). This is shown in Table 5.

The type of surgery performed was cross-referenced with postoperative follow-up (Table 6). It should be noted that the haemorrhage of the uterine sutures in the case of hysterectomy concerned the haemorrhage of the vaginal stump. In the case of myomectomy, the first complication was anaemia (3.5%) then uterine suture haemorrhage (1.7%) ($p = 0.5139$). For hysterectomy, the most frequent complication was bladder injury (2.9%). This is shown in Table 6.

Table 1: Cross-reference of BMI and myoma mapping.

BMI/Myoma mapping	*FIGO* 0	*FIGO* 1	*FIGO* 2	*FIGO* 3	*FIGO* 4	*FIGO* 5	*FIGO* 6	*FIGO* 7	Total
< 18	10,0% (1)	40,0% (4)	10,0% (1)	0,0% (0)	50,0% (5)	40,0% (4)	80,0% (8)	30,0% (3)	100% (26)
[14,24-30]	20,3% (14)	42,0% (29)	42,0% (29)	34,8% (24)	55,1% (38)	30,4% (21)	44,9% (31)	24,6% (17)	100% (203)
[14-19]	11,5% (10)	36,8% (32)	47,1% (41)	31,0% (27)	74,7% (65)	37,9% (33)	46,0% (40)	34,5% (30)	100% (278)
≥ 30	11,1% (3)	51,9% (14)	81,5% (22)	37,0% (10)	59,3% (16)	22,2% (6)	29,6% (8)	25,9% (7)	100% (86)
Total	14,5% (28)	40,9% (79)	48,2% (93)	31,6% (61)	64,2% (124)	33,2% (64)	45,1% (87)	29,5% (57)	100% (593)

The dependence is not significant. $\chi^2 = 26.96$, ddl = 21, $p = 0.17$. Some of the theoretical numbers are less than 5, the χ^2 rules are not really applicable. The χ^2 is calculated on the table of quotations (marginal numbers equal to the sum of the number of rows/columns).

Table 2: Cross-tabulation of surgical indication and myoma mapping.

Surgical indication/Myoma mapping	*FIGO* 0	*FIGO* 1	*FIGO* 2	*FIGO* 3	*FIGO* 4	*FIGO* 5	*FIGO* 6	*FIGO* 7	Total
Maternity desire	20,5% (15)	52,1% (38)	49,3% (36)	28,8% (21)	75,3% (55)	28,8% (21)	45,2% (33)	28,8% (21)	100% (240)
Menometrorrhagia	15,8% (27)	45,6% (78)	52,6% (90)	34,5% (59)	68,4% (117)	33,9% (58)	42,7% (73)	25,7% (44)	100% (546)
Urinary, rectal, and venous compression	12,1% (4)	21,2% (7)	33,3% (11)	30,3% (10)	60,6% (20)	48,5% (16)	84,8% (28)	63,6% (21)	100% (117)
Dysmenorrhea	5,1% (2)	20,5% (8)	56,4% (22)	35,9% (14)	76,9% (30)	48,7% (19)	43,6% (17)	33,3% (13)	100% (125)
Necrobiosis	12,5% (1)	25,0% (2)	25,0% (2)	12,5% (1)	50,0% (4)	0,0% (0)	75,0% (6)	75,0% (6)	100% (22)
Adenomyosis	13,0% (3)	39,1% (9)	60,9% (14)	56,5% (13)	78,3% (18)	52,2% (12)	21,7% (5)	17,4% (4)	100% (78)
Diaphragm compression	0,0% (0)	0,0% (0)	0,0% (0)	0,0% (0)	100% (1)	0,0% (0)	100% (1)	100% (1)	100% (3)
Total	14,5% (52)	40,9% (142)	48,2% (175)	31,6% (118)	64,2% (245)	33,2% (126)	45,1% (163)	29,5% (110)	100% (1131)

The dependence is highly significant. $\chi^2 = 71.39$, ddl = 42, $p = 0.0031$. Some of the theoretical numbers are less than 5, the χ^2 rules are not really applicable. χ^2 is calculated on the citation table (marginal numbers equal to the sum of row/column numbers).

Table 3: Cross-referencing of operative indication and surgical intervention.

Operative indication/ Surgical intervention	Myomectomy with cervical-isthmic tourniquet	Hysterectomy	Myomectomy without cervical isthmic tourniquet	Total
Maternity desire	89,0% (65)	4,1% (3)	6,8% (5)	100% (73)
Menometrorrhagia	60,8% (104)	35,7% (61)	3,5% (6)	100%(171)
Urinary, rectal and venous compression	45,5% (15)	48,5% (16)	6,1% (2)	100% (33)
Dysmenorrhea	59,0% (23)	38,5% (15)	2,6% (1)	100% (39)
Necrobiosis	62,5% (5)	25,0% (2)	12,5% (1)	100% (8)
Adenomyosis	69,6% (16)	30,4% (7)	0,0% (0)	100% (23)
Diaphragm compression	0,0% (0)	100% (1)	0,0% (0)	100% (1)
Total	59,6% (228)	35,2% (105)	5,2% (15)	100%(348)

The dependence is highly significant. $\chi^2 = 38.28$, ddl = 12, $p = 0.0001$. Some cells have a theoretical total lower than 5, the χ^2 rules are not really applicable. The χ^2 is calculated on the quotation table (marginal numbers equal to the sum of the number of rows/columns). The values in the table are the number of citations for each pair of terms.

Table 4: Cross-reference between myoma mapping and surgery.

Myoma Mapping/ Surgery	Myomectomy with cervical-isthmic tourniquet	Hysterectomy	Myomectomy without cervical isthmic tourniquet	Total
FIGO 0	50,0% (14)	35,7% (10)	14,3% (4)	100% (28)
FIGO 1	64,6% (51)	31,6% (25)	3,8% (3)	100% (79)
FIGO 2	59,1% (55)	39,8% (37)	1,1% (1)	100% (93)
FIGO 3	59,0% (36)	37,7% (23)	3,3% (2)	100% (61)
FIGO 4	66,1% (82)	33,1% (41)	0,8% (1)	100% (124)
FIGO 5	62,5% (40)	35,9% (23)	1,6% (1)	100% (64)
FIGO 6	62,1% (54)	36,8% (32)	1,1% (1)	100% (87)
FIGO 7	52,6% (30)	43,9% (25)	3,5% (2)	100% (57)
Total	59,6% (362)	35,2% (216)	5,2% (15)	100% (593)

The dependence is not significant. $\chi^2 = 23.39$, ddl = 14, $p = 0.0543$. Some of the theoretical numbers are less than 5, the χ^2 rules are not really applicable. The χ^2 is calculated on the table of quotations (marginal numbers equal to the sum of the number of rows/columns).

Table 5: Cross-referencing of myoma mapping and surgical outcomes.

Myoma mapping/ Surgical outcomes	Simple	Anaemia	Digestive wounds	Pelvic abscess	Bladder wounds	Uterine haemorrhage from the sutures	Urinary tract infection	Total
FIGO 0	96,4% (27)	3,6% (1)	0,0% (0)	0,0% (0)	0,0% (0)	0,0% (0)	0,0% (0)	100% (28)
FIGO 1	87,3% (69)	6,3% (5)	2,5% (2)	0,0% (0)	0,0% (0)	3,8% (3)	0,0% (0)	100% (79)
FIGO 2	90,3% (84)	3,2% (3)	0,0% (0)	0,0% (0)	2,2% (2)	3,2% (3)	1,1% (1)	100% (93)
FIGO 3	85,2% (52)	6,6% (4)	3,3% (2)	0,0% (0)	1,6% (1)	3,3% (2)	0,0% (0)	100% (61)
FIGO 4	91,9% (114)	2,4% (3)	1,6% (2)	0,0% (0)	0,8% (1)	2,4% (3)	0,8% (1)	100% (124)
FIGO 5	93,8% (60)	1,6% (1)	0,0% (0)	0,0% (0)	0,0% (0)	3,1% (2)	1,6% (1)	100% (64)
FIGO 6	89,7% (78)	1,1% (1)	2,3% (2)	1,1% (1)	1,1% (1)	3,4% (3)	1,1% (1)	100% (87)
FIGO 7	84,2% (48)	3,5% (2)	1,8% (1)	1,8% (1)	1,8% (1)	7,0% (4)	0,0% (0)	100% (57)
Total	91,7% (532)	2,6% (20)	1,0% (9)	0,5% (2)	1,0% (6)	2,6% (20)	0,5% (4)	100% (593)

The dependency is not significant. $\chi^2 = 28.34$, ddl = 42, $p = 0.947$. Theoretical numbers are less than 5, the χ^2 rules are not really applicable. The χ^2 is calculated on the table of citations (marginal numbers equal to the sum of the number of rows/columns). The values in the table are the number of citations for each pair of terms.

Table 6: Cross-referencing of the type of operation performed and the post-operational effects.

Surgery/Surgical outcomes	Simple	Anaemia	Digestive wounds	Pelvic abscess	Bladder wounds	Uterine haemorrhage from the sutures	Urinary tract infection	Total
Myomectomy with cervical-isthmic tourniquet	93,9% (108)	3,5% (4)	0,9% (1)	0,0%(0)	0,0%(0)	1,7% (2)	0,0% (0)	100% (115)
Hysterectomy	88,2% (60)	1,5% (1)	1,5% (1)	1,5%(1)	2,9%(2)	2,9% (2)	1,5% (1)	100% (68)
Myomectomy without cervical isthmic tourniquet	90,0% (9)	0,0% (0)	0,0% (0)	0,0%(0)	0,0%(0)	10,0% (1)	0,0% (0)	100% (10)
Total	91,7% (177)	2,6% (5)	1,0% (2)	0,5%(1)	1,0%(2)	2,6% (5)	0,5% (1)	100% (193)

The dependence is not significant. $\chi^2 = 11.18$, ddl = 12, $p = 0.5139$ Some of the theoretical numbers are less than 5, and the χ^2 rules are not really applicable. The values in the table are the row percentages based on 193 observations.

Discussion

Socio-demographic characteristics

The percentage of uterine myomas would tend to increase with age, nulliparity, and high BMI. These 3 parameters maintain at different levels the hyperoestrogenism favourable to the growth of myomas. Several authors in their study of uterine myomatous pathology found a predilection age after 35 years in correlation with a late first pregnancy [20-22]. High BMI is also implicated in the genesis of uterine myomas [23]. According to some authors, vitamin D deficiency plays a role in the occurrence of myomas since vitamin D inhibits tumor cell division and helps reduce the size of myomas [24-26]. For Dora Pavone, lifestyle contributes a lot to the genesis of myomas (diet, caffeine, and alcohol consumption, physical activity, stress, and smoking) [27].

Clinical characteristics of fibroids

Patients with a high BMI were more likely to have *FIGO* type 4 myomas ($p = 0.17$). Myoma mapping was not influenced by BMI.

The operative indication for uterine myomas depends on their mapping. Indeed, depending on the mapping of the myomas, particular symptomatology is manifested. This clinical expression concerns 1 in 3 women [28,29]. Intracavitary localisation (*FIGO* type 0-2) is frequently responsible for menometrorrhagia and fertility problems [14-16,30]. For intramural locations (*FIGO* 3,4) the symptomatology is dominated by dysmenorrhoea and menometrorrhagia. This is consistent with the cross-over with our study ($p = 0.0031$). The mechanism of this bleeding is explained by the poor retraction of the myometrium during the menstrual period and by the proliferation of the endometrium due to hyperoestrogenism. The more external myomas, i.e. sub-serous (*FIGO* 5-7), mainly cause compression of the neighbouring organs [16]. All this symptomatology contributes to altering the quality of life of patients [Erica E.]

Characteristics of the surgery

The surgical indication corresponded to the clinical expression of the myoma. The surgical attitude was conservative (myomectomy) when the indication was the desire for maternity or menometrorrhagia ($p = 0.0001$). However, it was radical (hysterectomy) when other organs were involved (ureters, diaphragm, veins), particularly due to compression. Kedra and colleagues found that more hysterectomies were performed than myomectomies in cases of menometrorrhagia (84.8% *vs.* 83.0%; $p = 0.39$) [20]. In her study there were more women aged 40 and over who did not want a child, hence the difference with ours. The more complications there are, the more radical the treatment of the myoma. Myomectomy, when possible, considerably reduces the signs and improves the quality of life of the patients as well as urinary disorders and reduces the risk of subsequent miscarriage, especially for *FIGO* type 0-2 myomas [18,19,31].

Myomectomy was most often performed for *FIGO* 4 myomas and hysterectomy for *FIGO* 7 myomas ($p = 0.0543$). Today, the management of uterine fibroids benefits from several means: medicinal (progestins, GnRH analogue), physical (radiofrequency ablation, arterial embolisation, vaginal occlusion of uterine arteries, cryotherapy), surgical (myomectomy, hysterectomy, robotic) [21,23,28,29,32-34]. For surgery there are several approaches: laparotomy, laparoscopy, and the vaginal route, the last two being less invasive [18]. Each of these methods has specific indications. The hysteroscopic approach should be avoided in case of obesity. It is preferred for *FIGO* type 0 and/or 1 fibroids < 2 cm [36-38]. An alternative to hysteroscopic myomectomy remains transvaginal ablation of the fibroid using the Sonata® system [39]. This is a system using radio frequencies. We do not use it in our current practice, especially as we are most often dealing with large fibroids ≥ 6 cm and most often *FIGO* type 4.

We did not find any significant increase in postoperative complications ($p = 0.947$). Myoma mapping has little influence on the medium-term postoperative course. Our study found no significant difference in postoperative complications for myomectomy and hysterectomy ($p = 0.51$). Myomectomy mainly poses a problem of anaemia due to the previous preoperative state of anaemia. This condition is aggravated postoperatively by uterine suture haemorrhage which can occur especially in *FIGO* type 5-7 myomas. Uterine suture haemorrhage can be considerably reduced by the cervical-isthmic tourniquet intraoperatively. But in general, there are few complications of myomectomy, i.e. 1% to 5% [40]. Bladder sores are complications described in cases of hysterectomy [41]. It is necessary to be able to prevent them by the dexterity of the surgical team and by respecting the operative steps, but above all to repair them intraoperatively.

Conclusion

This study allowed us to assess our surgical practice in the management of myomas at the Teaching Hospital of Angre. The most common procedure was laparotomy under a cervical-isthmic tourniquet. The patients were most often over 35 years old and nulliparous. The main indications for surgery were menometrorrhagia, desire for motherhood, and dysmenorrhoea. These indications led to surgical management, which in most cases was conservative. Hysterectomy was reserved for cases with excessive compressive complications. In general, few postoperative complications were observed.

From this work, it appears that at the Teaching Hospital of Angre, surgical practice is in line with *FIGO* recommendations concerning the surgical management of myomas. That is to say, myomectomies in young women and hysterectomies in older women without a desire for motherhood.

However, an effort must be made to promote the minimally invasive surgical approach (laparoscopic, hysteroscopic, transvaginal removal) for small fibroids (≤ 5 cm) or FIGO type 0 to 3.

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