Uterine Fibroid: Clinical Presentation and Relative Morbidity of Abdominal Myomectomy and Total Abdominal Hysterectomy, in a Teaching Hospital of Karachi, Pakistan

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ABSTRACT

Objective: To compare clinical presentation and morbidity of abdominal myomectomy and hysterectomy.

Methods: We reviewed medical records of 441 patients with symptomatic fibroid, treated by myomectomy (135) or hysterectomy (306) at The Aga Khan University Hospital, Karachi, from January 1991 to December 1995. Z-test and risk estimates with 95% confidence intervals were calculated.

Results: Pregnancy loss [Risk Ratio = 2.79, 95% Confidence Interval= 1.90 - 4.10], pelvic mass [Risk Ratio = 2.22, 95% Confidence Interval = 1.68 - 2.92] and infertility [Risk Ratio = 1.44, 95% Confidence Interval = 1.05-1.96] were more likely to be managed by myomectomy than in the absence of these complaints. Abnormal uterine bleeding was less likely to be treated by myomectomy than in its absence [Risk Ratio = 0.54, 95% Confidence Interval = 0.41 - 0.71]. With myomectomy, both the estimated mean intra-operative blood loss and the risk of febrile morbidity were significantly less than with hysterectomy [Mean (S.D.): 386 milliliters (48) versus 567 milliliters (62), p-value 0.000 and Risk Ratio = 0.37, 95% Confidence Interval = 0.16 - 0.87, respectively]. The risk of visceral injury [Risk Ratio = 2.24, 95% Confidence Interval = 0.74 - 6.82], blood transfusion [Risk Ratio = 0.69, 95% Confidence Interval = 0.44 - 1.07], mean duration of operating time [Mean (S.D.) 127 minutes (35) versus 131 minutes (47), p-value 0.93] and mean duration of hospital stay [Mean (S.D.): 5.44 days (1.28) versus 5.42 days (1.09), p-value 0.92] did not differ significantly between the groups.

Conclusion: Myomectomy can be considered as a safe alternative to hysterectomy for the surgical management of uterine fibroids, with an added advantage of preservation of women's sexual and reproductive functions.

Keywords: Uterine fibroid, abdominal myomectomy, total abdominal hysterectomy, intra-operative blood loss, febrile morbidity

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INTRODUCTION

Uterine fibroids are the commonest benign tumours of the female genital tract, occurring in more than 50% of women[1]. However, they are symptomatic in less than 50% of the cases, presenting commonly as abnormal uterine bleeding, infertility or pressure symptoms[2]. They cause menorrhagia in 30% of patients that can produce anaemia[3]. Fibroids are associated with infertility in 5% to 10% of cases, but when all other causes of infertility are excluded, they are responsible for infertility in 2% to 3% of cases[4]. Also, the risk of repeated spontaneous abortions is estimated to be two to three times greater with fibroid than in its absence[3].

Generally, symptomatic fibroids require treatment in the form of hormones or surgery[1,5]. Hysterectomy has been considered the traditional and definitive treatment for symptomatic fibroids[1,5,6]. Fibroids account for 20-30% of all hysterectomies[5] and 40% of abdominal hysterectomies[7]. Approximately, six hysterectomies are performed for every myomectomy in the surgical management of fibroids[8].

Hysterectomy is generally recommended, if the patient's family is complete and if there is no cultural or individual desire to preserve the uterus, as it cures menorrhagia and prevents recurrence of fibroid mass[9]. However, with hysterectomy, sexual feelings are adversely affected through dyspareunia and the loss of deep orgasm[6]. Psychological implications, such as depression and anxiety are observed in 8% and 6% of the cases respectively, up to one year after surgery[10]. Besides, hysterectomy is associated with three-fold increase in the risk of cardiovascular disease among pre-menopausal women[11], 1-3% risk of haemorrhage[12], an estimated 15-38% post-operative febrile morbidity[13]

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and an additional morbidity due to incidental injury to adjacent organs in 0.5% of the patients[13].

Considering the short-term and the long-term adverse effects of hysterectomy, concern about preservation of the reproductive organs is rising in current clinical practice. Myomectomy is therefore, being preferred over hysterectomy in the surgical management of patients with symptomatic fibroids, irrespective of their desire for future childbearing[14]. Myomectomy is followed by a subjective relief of menorrhagia in 75% of patients[5], successful pregnancies in up to 59% of those trying to conceive after surgery[15,16] and a decrease in the incidence of spontaneous abortion in women with fibroids from 40% to about 20%[1].

However, fibroids recur in 15-30% of women who undergo myomectomy[4,6] and 10-25% of these women require further surgery[5,14]. Besides, it may be technically more difficult[5], often time consuming[6] and associated with three times greater risk of elevated temperature postoperatively compared to hysterectomy[17]. On the other hand, studies based on series of patients who underwent abdominal myomectomy have described no major operative complications, requirement for blood transfusions or occurrence of febrile morbidity, suggesting myomectomy in carefully selected patients[15,18-20].

Being the leading cause of hysterectomy among pre-menopausal women[21], uterine fibroid remains the major public health problem, for which sufficient epidemiological evidence for its management is lacking. Thus, the debate continues in the medical literature about what could be the best surgical management for a patient with symptoms of uterine fibroid, keeping in view her sexual and reproductive needs. The argument revolves around factors such, as the need for preservation of uterus, operative complications, need for blood transfusion and post-operative morbidity. Except for the reports by Iverson RE et al[17,22], most of the available evidence is based upon a series of patients who underwent abdominal myomectomy without having appropriate comparison group[15,18-20]. Furthermore, the studies on the surgical management of fibroid have been primarily carried out in the clinical setting of the developed world, with the availability of improved facilities and expertise. The need to examine this subject in a developing country like Pakistan continues to exist. Hence, the present study aims to examine the clinical features as well as the risk of intra-operative and the short-term post-operative complications associated with abdominal myomectomy compared to total abdominal hysterectomy, in the surgical management of uterine fibroid, in a teaching hospital of Karachi, Pakistan.

METHODS

We carried out a five-year retrospective review of the medical records of all patients with symptomatic fibroid uterus, who underwent either abdominal myomectomy or total abdominal hysterectomy for the specific indication of leiomyomas, between January 1991 to December 1995, at The Aga Khan University Hospital, Karachi. The Aga Khan University Hospital is a tertiary-care teaching hospital, equipped with emergency and surgical facilities. For all major gynaecological surgeries, 2 grams of tablet metronidazole is given on the night before the surgery and 1 gram of injection cephazoline is given two hours prior to surgery. In addition, injection cephazoline 1 gram intravenously, six hourly and injection metronidazole 500 milligrams intravenously, eight hourly are given as a prophylactic dose, post-operatively for 24 hours. During myomectomy, uterine cavity is opened through an anterior incision, only if sub-mucous myomas are known to be present and to have an easy access to posterior wall fibroids. In case of multiple fibroids, an attempt is made to remove as many fibroids as possible. Haemostasis during surgery is secured by the application of Bonney's myomectomy clamp.

We studied 441 women who had symptomatic fibroids and who were treated either by abdominal myomectomy or total abdominal hysterectomy. The procedures were carried out by senior residents (year 4), under the supervision of experienced attending physicians. Information about diagnosis of fibroid was obtained from the pre-operative notes, which in turn was based on physical examination and ultrasound findings. Uterine size was obtained from physical examination. Size of the largest leiomyoma and the microscopic features of the fibroids were obtained from the histo-pathological report. Information about the type, number and location of fibroids were retrieved from the surgeon's operative notes.

Women with asymptomatic fibroids and those with symptomatic fibroids, managed conservatively were excluded from the study. Also, women who underwent surgery for conditions other than leiomyomas, those in whom uterine fibroids were incidentally identified at the time of surgery or on histo-pathology, were not made part of the study.

The parameters used to assess intra-operative and post-operative complications included estimated intra-operative blood loss, operating time, visceral injury at the time of surgery, requirement for blood transfusion during or after the surgery, postoperative febrile morbidity (defined as a temperature of 38 degree centigrade or greater after the first 24 hours

post-operatively), and the duration of hospital stay, following surgery.

Statistical analysis was performed with the Epi-Info package[23]. Z test was used for continuous variables and statistically significant differences required a p value of <0.05. Risk Ratios were calculated for categorical variables along with their 95% confidence intervals.

RESULTS

During the five-year study period, 441 women underwent either abdominal myomectomy or total abdominal hysterectomy for the treatment of symptomatic uterine fibroids, at The Aga Khan University Hospital, Karachi. Their age ranged between 20 and 50 years and 70% of married patients had at least one child (Table I). Patients who received hormonal therapy within six months prior to surgery (19%) were on Progesterone[49], Gonadotrophin Releasing Hormone Agonist (GnRHa)[5] or Danazol[30].

Abnormal uterine bleeding was the most common presenting feature, followed by chronic pelvic pain, dysmenorrhoea and primary infertility (Table II). On gross examination, the most common type was intramural fibroid and the commonest location of the fibroid was at the fundus of the uterus. On microscopic examination, cervicitis was the most common accompanying feature, followed by degeneration and adenomyosis (Table III).

About one-third of the study subjects (135) underwent abdominal myomectomy and the rest (69.4%) underwent total abdominal hysterectomy, as a surgical treatment for uterine fibroid. None of the planned myomectomy was converted to hysterectomy, intra-operatively. Compared to hysterectomy, myomectomy was performed for relatively younger women than hysterectomy. Unmarried and nulliparous patients were 4.5 and three times more likely to be treated with myomectomy than married and parous patients, respectively. Although, overall pre-operative mean haemoglobin levels of the two groups were similar, 20% of the patients who underwent myomectomy received blood transfusion pre-operatively, compared to 12% of those who underwent hysterectomy. However, patients who were transfused blood before hysterectomy had significantly lower mean haemoglobin levels compared to those who were transfused before myomectomy (Table IV).

Table V lists the indications for surgery. Abnormal uterine bleeding was a leading complaint in both the groups. However, patients presenting with abnormal uterine bleeding were 46% of the times less likely to be treated by myomectomy than those not presenting with abnormal uterine bleeding. On the other hand,

Table I. Pre-operative characteristics of patients with uterine fibroid (N=441).

Continuous Variables	Mean (S.D.)
Age (years)	36.7 (5.9)
Haemoglobin (gm/dl)	11.1 (2.3)
Haematocrit %	33.2 (6.7)
Average number of pints of packed red cells transfused preoperatively	2.6 (1.4)
Haemoglobin (gm/dl) of those who were transfused blood	7.9 (2.0)
Categorical Variables	**n (%)**
Marital Status	
Married	369 (83.7)
Unmarried	72 (16.3)
Parity among married patients	
Nulliparous	111 (30.1)
Parous	258 (69.9)
Preoperative blood transfusion	66 (17.6)
Preoperative hormonal treatment received	84 (19%)

Table II. Clinical presentation of patients with uterine fibroid (N=441).

Presenting complaints	n (%) *	Mean duration of complaint (S.D.)
Abnormal uterine bleeding	327 (74.1)	3.0 years (3.2)
Chronic pelvic pain	129 (29.3)	2.2 years (3.0)
Dysmenorrhoea	108 (24.5)	3.3 years (3.6)
Infertility	81 (18.4)	12.5 years (7.0)
Dyspareunia	27 (6.1)	3.4 years (3.3)
Backache	21 (4.8)	2.8 years (2.4)
Acute pelvic pain	15 (3.6)	3.5 months (10.6)
Urinary frequency	15 (3.4)	8.2 months (6.0)
Urinary urgency	6 (1.4)	1 year (1.3)
Urinary retention	6 (1.4)	5 days (5.3)
Pregnancy loss	6 (1.4)	–
Constipation	3 (0.7)	1 year (1.2 years)

* Please note that the percentages of clinical presentations do not add to 100%, due to multiple presenting complaints reported.

Table III. Pathological features of uterine fibroid identified in 441 study subjects.

Categorical Variables		n (%) *
Types	Intramural	204 (55.3)
	Sub-serosal	171 (44.9)
	Sub-mucosal	105 (30.2)
Location	Fundal	183 (41.5)
	Anterior wall	171 (38.8)
	Posterior wall	153 (34.7)
	Cervical	6 (1.4)
	Others	3 (0.7)
Number	Solitary	393 (89)
	Multiple	48 (11)
Histo-pathological features	Cervicitis	189 (50.8)
	Degeneration	66 (19.3)
	Adenomyosis	60 (17.5)
	Endometriosis	21 (6.2)
	Others	105 (23.8)
Continuous Variables		**Mean (S.D.)**
Size of largest myoma	Length (centimeters)	7.0 (2.2)
	Breadth (centimeters)	5.8 (1.9)

* Please note that the percentages do not add to 100%, due to removal of multiple fibroids in 11% of the patients.

Table IV. Pre-operative characteristics of the study subjects, according to the type of surgery (N=441).

Patient characteristics	Myomectomy n=135	Hysterectomy n= 306	
Continuous Variables			**P value**
Mean Age (years) (S.D.)	31.1 (5.4)	39.2 (4.2)	0.00
Mean Haemoglobin (gm/dl) (S.D.)	10.9 (2.3)	11.1 (2.3)	0.27
Mean Haematocrit % (S.D.)	32.4 (6.8)	33.6 (6.6)	0.11
Mean Haemoglobin (gm/dl) of patients transfused blood preoperatively (S.D.)	8.5 (1.5)	7.4 (2.2)	0.02
Categorical Variables			**Risk Ratio (95% Confidence Interval)**
Marital Status			
Unmarried	63	9	4.49 (3.58 - 5.62)
Married	72	297	1.00
Parity among married patients			
Nulliparous	40	71	2.90 (1.93 - 4.36)
Parous	32	226	1.00
Pre-operative blood transfusion	27	39	0.70 (0.51 - 0.98)
Pre-operative hormonal treatment received	25	59	0.67 (0.47- 0.96)

Table V. Indications for myomectomy or hysterectomy*.

Indications for surgery	Myomectomy n = 135	Hysterectomy n = 306	Risk Ratio (95% Confidence Interval)
Abnormal uterine bleeding	82	245	0.54 (0.41 - 0.71)
Infertility	33	48	1.44 (1.1 - 1.96)
Pregnancy loss	5	1	2.79 (1.90 - 4.10)
Pelvic mass	72	78	2.22 (1.68 - 2.92)
Acute pelvic pain	3	12	0.64 (0.23 - 1.79)
Chronic pelvic pain	39	90	1.00 (0.74 - 1.36)
Backache	3	18	0.45 (0.16 - 1.31)
Constipation	0	3	0.00
Urinary frequency	3	12	0.65 (0.23 - 1.79)
Urinary urgency	0	6	0.00
Urinary retention	3	3	1.65 (0.73 - 3.71)
Dyspareunia	6	21	0.71 (0.35 - 1.47)
Dysmenorrhoea	38	70	1.21 (0.89 - 1.64)
Anemia	44	103	0.97 (0.72 -1.31)
Previous myomectomy	0	6	0.00

* Patients with more than one indication are listed more than once.

patients with a previous history of pregnancy loss, those presenting with pelvic mass and infertility were more likely to undergo myomectomy than those not presenting with these complaints (Table V). There were six patients who underwent hysterectomy due to recurrence of fibroid, after previous myomectomy.

Average size, number and location of uterine fibroids did not differ between the two surgical groups. However, the myomectomy group had a significantly larger mean uterine size than the hysterectomy group (table VI). The overall complication rates for myomectomy and hysterectomy patients were 24.4% and 36.3%, respectively (Table VII). Among the myomectomy group, three patients had bladder injury, two had bowel injury and one had ureteral injury. On the other hand, there were three cases of ureteral injury, two cases of bladder injury and one case of bowel injury in the hysterectomy group. Although, the risk of visceral injury was twice greater with myomectomy than with hysterectomy, the results

Table VI. Gross features of uterine fibroids on pathological and physical examination, by mode of surgery.

Gross features	Myomectomy n= 135	Hysterectomy n=306	
Continuous Variables			**P value**
Length of largest myoma (centimeters)	6.96 (4.55)	6.7 (3.22)	0.28
Breadth of largest myoma (centimeters)	6.08 (3.75)	5.60 (2.96)	0.17
Uterine size (weeks)	15.7 (2.6)	14.8 (1.8)	0.00
Categorical Variables			**Risk Ratio (95% Confidence Interval)**
Number of myomas			
Solitary	120	273	0.97 (0.62 - 1.51)
Multiple	15	33	1.00
Location of myomas			
Anterior wall	68	103	1.05 (0.81 - 1.37)
Posterior wall	50	95	0.91 (0.68 -1.22)
Fundal	69	114	1.00

Table VII. Intra-operative and post-operative complications associated with myomectomy and hysterectomy.

Surgical complications	Myomectomy n=135	Hysterectomy n=306	Risk Ratio (95% Confidence Interval) or P-value
Estimated mean intra-operative blood loss (milliliters) (S.D.)	386 (48)	567 (62)	0.000
Mean duration of operating time (minutes) (S.D.)	127 (35)	131 (47)	0.93
Visceral injury	6	6	2.24 (0.74 - 6.82)
Blood transfusion	21	69	0.69 (0.44 - 1.07)
Fever	6	36	0.37 (0.16 -0.87)
Mean duration of hospital stay (days) (S.D.)	5.44 (1.28)	5.42 (1.09)	0.92

were not statistically significant. On the other hand, myomectomy was associated with 63% less risk of post-operative febrile morbidity than hysterectomy (Table VII). Fever among myomectomy patients was due to urinary tract infection[3] and wound site infection[2] while for one patient, the reason for fever was unexplained. Among patients who underwent hysterectomy, 22 had unexplained fever, nine had fever due to operative site infection, and three had urinary tract infection while one each had pneumonia and deep venous thrombosis.

Overall, 20% of our patients were transfused blood, post-operatively. Although the mean estimated intra-operative blood loss was significantly less with the myomectomy group compared to hysterectomy group, the mean duration of operating time, the proportion of patients, who were transfused blood and mean duration of hospital stay did not differ significantly between the two surgical modes of treatment.

DISCUSSION

Except for the reports by Iverson RE et al[17,22], available literature does not provide an adequate comparison of abdominal myomectomy and total abdominal hysterectomy for the management of uterine leiomyomas. Most of the studies[15,18,20] reported morbidity in the series of patients who underwent abdominal myomectomy. LaMorte et al[19] presented a case series of abdominal myomectomies, comparing the associated post-operative febrile morbidity and intra-operative or post-operative blood transfusion with historical hysterectomy data. With the patients who underwent hysterectomy serving as the comparison group, we determined the estimated intra-operative blood loss, operating time, the risk of visceral injury, febrile morbidity, blood transfusion and duration of hospital stay, associated with myomectomy, in a Karachi teaching hospital. However, we did not examine the long-term effects of myomectomy such as relief of symptoms, conception rate and recurrence of myomas following myomectomy.

The average age of women undergoing myomectomy was significantly lower than that of hysterectomy group as was also observed by Iverson RE et al[22]. As myomectomy is used as a fertility enhancing procedure, un-married and nulliparous women were more likely to be treated by this procedure than by hysterectomy. Number and size of fibroids are often considered as the factors in deciding surgical

treatment options for the patients with uterine fibroid[1]. However, these characteristics did not differ significantly, between the two groups.

The risk of febrile morbidity in our patients is difficult to compare with those in prior studies, as the risk estimates for myomectomy and hysterectomy series are separately reported in different studies. Also, various research reports have used different definitions for post-operative febrile morbidity. Rosenfeld[18] and Smith[15] reported no post-operative febrile morbidity following myomectomy but they did not define their criteria for febrile morbidity. LaMorte et al[19] defined febrile morbidity in a way similar to us and reported a 12% risk of febrile morbidity after myomectomy which was greater than that observed among our group of patients who underwent myomectomy (4.4%). We observed a higher rate of febrile morbidity among patients who underwent hysterectomy (11.8%) than that observed by Gambone et al[23] who reported a 10% febrile morbidity after hysterectomies for many different indications. This may be explained in part by a restrictive definition of fever used by Gambone i.e. the temperature over 101 degree Fahrenheit excluding the first 48 hours. However, Dicker RC et al[25], while assessing morbidity associated with abdominal hysterectomy used a similar definition of post-operative febrile morbidity as ours and reported a much higher risk of febrile morbidity (32.2%) with hysterectomy than that observed in our study.

We reported post-operative febrile morbidity, after the first 24 hours, following surgery. This is because, transient temperature elevation to as high as 101 degree Fahrenheit in the immediate post-operative period might occur, secondary to tissue necrosis in the uterus or intra-peritoneal blood, that often resolves spontaneously without treatment[14]. Using the patients who underwent hysterectomy as controls, we observed a significantly lower risk of febrile morbidity among those who underwent myomectomy. This finding is in contrast to that observed by Iverson et al[17] who reported a 3.2 times greater risk of febrile morbidity among myomectomy group compared to hysterectomy group. However, Iverson et al[17] looked into the febrile morbidity within the first 48 hours, after surgery.

We examined the need for intra-operative or post-operative blood transfusion for myomectomy and hysterectomy groups, as a proxy for the operative blood loss. Although, the uterine size is considered as a predictor of the intra-operative blood loss[22], we did not observe a significant difference in the need for blood transfusion between the two groups, despite a significantly larger mean uterine size in the myomectomy group. We also did not observe a significant difference in the risk of visceral injury and the duration of hospital stay among patients who underwent either myomectomy or hysterectomy. These findings differ from those reported by Iverson et al[22] who observed greater transfusion rates and the risk of visceral injury among hysterectomy group compared to myomectomy group.

The observations of our study, being reported from a developing country, could be of great clinical interest. However, while interpreting these results, its potential limitations are to be kept in mind, including the validity and reliability of medical record information and the non-experimental nature of the study. Hence, the relative morbidity of myomectomy and abdominal hysterectomy can be examined conclusively only by a prospective clinical trial with uniform management guidelines, inclusion criteria and detailed and appropriate reporting of relevant information, which itself is a difficult task.

Till such studies are conducted, given the lower risk of febrile morbidity with abdominal myomectomy compared to total abdominal hysterectomy and the insignificant difference in the risk of visceral injury, blood transfusion and the duration of hospital stay between the two surgical procedures, abdominal myomectomy may be considered an attractive alternative to total abdominal hysterectomy for the surgical management of women with uterine fibroid. Hence, the adverse physical and psychological effects of the loss of reproductive organ by hysterectomy in the socio-cultural set-up of the developing country like Pakistan and in the developed world at large, can be avoided by selective use of abdominal myomectomy. This would also allow patient preference to be incorporated into clinical decision-making, while choosing the appropriate procedure for the surgical management of fibroid.

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