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Research Article

Fertility Predictability Tools for Clinical Outcomes After Myomectomy Procedure for Intramural Fibroids in Cases of Unexplained Infertility

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Abstract

Background: The submucous and intramural categories of uterine fibroids are considered by most reproductive practitioners are factors that could hinder embryonic implantation.

Aim: Elucidation and investigation of factors correlated to reproductive outcomes in infertility cases having myomectomy procedure for Intramural situated fibroids.

Methodology: A clinical research trial in which 150 cases having unexplained infertility in the presence of intramural fibroid category were recruited for the research study data was gathered in a retrospective fashion to elucidate the full clinical data and operative details.

Results: There was statistical significance as regards Age > 40 yrs. and Cavity entry (p values=0.0007,0.0017 consecutively), whereas there was no statistical significance for Fibroid measure on imaging and diameter of largest fibroid in correlation to successful conception occurrence.

Conclusion: Intramural fibroids removal have a positive impact in enhancing fertility potential, however in occurrence of uterine wall disruption fertility potential from myomectomy is reduced. Furthermore, age is a chief factor in maximizing the operative clinical reproductive benefit.

Keywords: Unexplained infertility; Fibroids; Myomectomy; Fertility predictability

Introduction

Fibroids are the most common benign tumor affecting the female genital tract and, in many cases, asymptomatic although having a range of prevalence of around 30 percent among reproductive female age group there is great variability in the site and size of uterine fibroids [1-3]. The submucous and intramural categories of uterine fibroids are considered by most reproductive practitioners are factors that could hinder embryonic implantation particularly in cases requiring ART management protocols [4-6].

Fibroids in general not only could affect implementation but could reduce reproductive capacity by impairment of blood supply or harmonic hormonal balance. The decision to remove uterine fibroids to increase the female reproductive potential should be balanced against the risks of permanent uterine affection, however sometimes it is an issue of high debate among fertility physicians that requires adequate justification before implementation [7-9].

Cases symptomatizing from uterine fibroids are definitely improved as regards menstrual symptoms and pressure symptoms profile by performing the myomectomy procedure but still the reproductive outcomes and conception rates among those categories of cases is an issue of research debate and requires further research efforts to elucidate possible reproductive benefits of the myomectomy procedure in patients seeking fertility management. a more research effort demanding question is whether cases with normal uterine cavity would benefit from intramural fibroid resection is an interesting concern to raise and is a common clinical case scenario [10-13].

Aim of the Work

Elucidation and investigation of factors correlated to reproductive outcomes in infertility cases having myomectomy procedure for Intramural situated fibroids.

Methodology

This clinical research trial was carried at 2 surgical places including Benha University Hospital Obstetrics and Gynecology Department, and Cleopatra Obstetrics& Gynecology Specialized center in Benha City,Qalubia Governorate, Egypt from March 2015 to January 2019. We had ethical approval for this study protocol from Benha Faculty of Medicine ethical committee; also, all included participants signed full informed written consents.

A clinical research trial in which 150 cases having unexplained infertility in the presence of intramural fibroid category were recruited for the research study data was gathered in a retrospective fashion to elucidate the full clinical data and operative details Inclusive research criteria have been as follows cases aged ≤43 years, with clinical diagnosis of unexplained infertility besides the existence of minimally one intramural leiomyoma observed by an imaging investigative tool (sonography or MRI), cases have been consecutively undergone myomectomy surgical procedure (abdominal or laparoscopic). intramural leiomyoma have been defined as a fibroid with above 50% of its volume situated within the myometrial uterine layer, research study subjects were excluded if they had ,only submucous or subserous leiomyomas or submucous and/or subserous leiomyomas coexisting with intramural leiomyomas, no desire for conception after myomectomy ,other infertility issues diagnosed (e.g. male factor, anovulation, There have been no exclusions by size or number of fibroids. Research study subjects were categorized later in to two research groups according to occurrence of conception with analysis of clinical and operative data according to reproductive outcomes to elucidate factors associated with increased conception rates in those categories of cases.

Statistical Analysis

Data were collected, revised, coded and entered to the Statistical Package for Social Science (IBM SPSS) version 23. Data were checked for normality using Kolmogorov-Smirnov test and the quantitative data with parametric distribution were presented as mean, standard deviations and ranges and compared using Independent t-test while non parametric distribution were presented as median with inter-quartile range (IQR) and compared using Mann-Whitney test. Also, the comparison between groups regarding to qualitative parameters were done by using Chi-square test and/or Fisher exact test when the expected count in any cell found less than 5. Multivariate logistic regression analysis was used to assess the parameters related to successful conception. The confidence interval was set to 95% and the margin of error accepted was set to 5%. So, the p-value was considered significant at the level of < 0.05.

Results

Table 1: Demographic, baseline and preoperative characteristics in relation to conception.

	Patients who conceived No. = 87	Patients who did not conceived No. = 63	Test value	P-value	Sig.
Age (years)	33.4 ± 2.3	36.8 ± 3.2	7.574•	<0.001	HS
< 35	32 (36.78%)	20 (31.7%)	0.409*	0.522	NS
35 - 37	21 (24.14%)	8 (12.7%)	3.066*	0.079	NS
38 - 39	18 (20.69%)	7 (11.1%)	2.414*	0.12	NS
≥ 40	16 (18.39%)	28 (44.4%)	11.965*	0.001	HS
BMI	24.3 ± 3.6	25.1 ± 4.2	1.252•	0.213	NS
Gravidity	1 (0 - 5)	0 (0 - 4)	1.341≠	0.123	NS
Parity	0 (0 - 3)	1 (0 - 3)	1.517≠	0.098	NS
Duration of infertility (months)	28 (14 - 86)	23 (14 - 95)	1.110≠	0.205	NS
HCT (%)	37.5 ± 5.42	38.3 ± 6.84	0.799•	0.426	NS
Uterine size	14.0 (7 - 28)	15.5 (8 - 30)	1.019≠	0.243	NS
Uterine volume on imaging (cc)	498.6 (113.5 - 4351)	537.9 (215.3 - 4832)	2.018≠	0.198	NS
Fibroid measure in imaging (cm)	7.5 (3.5 - 21.5)	5.4 (1.8 - 10.3)	3.172≠	0.007	HS
Cavity impingement in imaging	57 (65.5%)	35 (55.6%)	1.529≠	0.216	NS

*: Chi-square test; •: Independent t-test; ≠: Mann-Whitney test

Table 1 reveals and displays the comparative statistical analysis between patients who conceived and patients who did not conceive as regards demographic ,baseline and preoperative characteristics in which there was a highly statistical significant difference as regards mean age +/-SD between both research categories (p value<0.001),whereas cases aged below 35 years and ranging between 35-37 years ,and cases from 38 till 39 years there was no statistically significant difference observed

(p values=0.522,0.079,0.120 consecutively)whereas cases ≥ 40 years there was a highly statistical significant difference (p value<0.001),besides as regards BMI, gravidity ,parity ,duration of infertility, HCT, uterine size, uterine volume on imaging (cc),cavity impringement on imaging (p values=0.231, 0.123, 0.098, 0.205, 0.426, 0.243, 0.198, 0.216 consecutively), on the other hand fibroid volume on imaging was statistically significantly higher among the research group that conceived (p value=0.007).

Table 2: Operative and Postoperative phase characteristics in relation to conception.

	Patients who conceived No. = 87	Patients who did not conceived No. = 63	Test value	P-value	Sig.
Surgical modality			0.329*	0.566	NS
Abdominal	47 (54.0%)	37 (58.7%)			
Laparoscopic	40 (46.0%)	26 (41.3%)			
Operative time (min)	183.6 ± 45.3	192.7 ± 53.4	1.126•	0.262	NS
Blood loss (cc)	310 (50 - 3000)	295 (30 - 2300)	0.089≠	0.811	NS
Uterine size (weeks)	15.3 ± 3.8	14.8 ± 5.2	0.681•	0.497	NS
Total fibroids removed	5 (2 - 54)	6 (3 - 61)	0.102≠	0.887	NS
Total fibroids left in situ	0 (0 - 2)	0 (0 - 3)	1.203≠	0.384	NS
Diameter of largest fibroid (cm)	8.3 (5 - 28)	6.1 (1.8 - 19)	2.714≠	0.019	S
Specimen weight (g)	285.9 (15 - 1910)	221.8 (12 - 1150)	1.014≠	0.402	NS
Cavity impingement	62 (71.3%)	39 (61.9%)	1.455*	0.227	NS
Cavity entry	8 (9.2%)	19 (30.2%)	10.879*	0.001	HS
Intraoperative complications	6 (6.9%)	5 (7.9%)	0.058	0.809	NS
Postoperative complications	7 (8.0%)	6 (9.5%)	0.101*	0.75	NS
Total complications	10 (11.5%)	10 (15.9%)	0.606*	0.436	NS
Hospital length of stay (days)	3 (0 - 7)	3 (0 - 12)	1.315≠	0.302	NS

*: Chi-square test; •: Independent t-test; ≠: Mann-Whitney test

Table 2 reveals and displays comparative statistical analysis as regards operative and preoperative phase characteristics between patients who conceived and patients who did not conceive research groups in which there was no statistical significant difference as regards surgical modality ,operative time (min), blood loss(cc), uterine size (weeks) total fibroids removed, total fibroids removed, total fibroids left in situ, specimen weight (gm), cavity impingement, intraoperative complications, postoperative complications ,total complications, hospital length of stay (days) (p values=0.566, 0.262, 0.811, 0.497, 0.887, 0.384, 0.402, 0.227, 0.809, 0.750, 0.436, 0.302 consecutively), on the other hand the Diameter of largest fibroid (cm) was statistically significantly higher among the patients who conceived in comparison to cases that have conceived (p value=0.019),besides cavity entery was statistically significantly higher among cases that didn't conceive in comparison to cases that conceived (p value=0.001).

Table 3: Multivariable logistic regression analysis for factors correlated to successful conception.

	Odds ratio (95% CI)	P-value
Age > 40 yrs	0.2817 (0.1350 to 0.5878)	0.0007
Fibroid measure on imaging	1.36 (0.8513 to 1.3640)	0.201
Diameter of largest fibroid (cm)	2.1235 (0.916 - 2.8561)	0.097
Cavity entry	0.2345 (0.0949 to 0.5795)	0.0017

Table 3 reveals and displays that there was statistical significance as regards Age > 40 yrs. and Cavity entry (p values=0.0007, 0.0017

consecutively), whereas there was no statistical significance for Fibroid measure on imaging and diameter of largest fibroid in correlation to successful conception occurrence.

Discussion

Counselling cases with uterine fibroids for myomectomy to enhance chances of conception is considered one of the cornerstone practice issues in every day fertility practice this practice however should be based on research-based evidence to enhance and elucidate the possible success rates expected from infertility management protocols. Restricted research-based evidence exists as regards reproductive clinical outcomes after that indicated intervention [14,15].

A prior research study similar to the current study in approach and methodology was conducted on females having unexplained infertility issues , apart from the existence of uterine leiomyoma , interestingly it was revealed and displayed by the research group of investigators that 58.3% have accomplished conception successfully after myomectomy and 44.9% have successfully delivered a live Neonate , with a mean conception time of around fourteen months. Those indices and statistical analysis results have shown great harmony and similarity to the current research study findings, furthermore prior research groups of investigators have shown in similar indicated interventions in infertility cases a rate of pregnancy around 57%, however the conception time differed having a range of around 8 till 20 months after performing the myomectomy procedure [16,17].

Another research study previously conducted have shown among their study findings it was shown that conception was accomplished in a spontaneous manner spontaneously in about 54% of recruited cases whereas about 39% of cases had IVF management protocols required to accomplish conception successfully [18,19]. The current and prior research study findings could be justified by the fact that cases with unexplained infertility could be multifactorial in nature however when performing the myomectomy that reduces the obstacles at molecular and cellular levels for successful implantation to occur [1,4,9].

Another research study priorly performed designed in a manner to identify factors correlated and linked associated to fertility management clinical outcomes after performing myomectomy for intramural fibroids in cases having unexplained infertility issues have shown that the patient's age at time of myomectomy procedure performance, was correlated to conception rates .furthermore another research study interestingly have shown that smaller fibroids removal, and the observation of uterine wall disruption during myomectomy, were both correlated and linked to decreased likelihood of achieving conception after finishing the myomectomy procedure [2,7,11,13].

Conclusion and Future Research Recommendations

Intramural fibroids removal has a positive impact in enhancing fertility potential, however in occurrence of uterine wall disruption fertility potential from myomectomy is reduced. Furthermore, age is a chief factor in maximizing the operative clinical reproductive benefit. future research studies are recommended to be multicentric in manner with consideration of other factors such as tubal and ovarian factors in an effort to innovate a clinical algorithm in management of those category of cases.

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