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Review article

Uterine Fibroid Embolization with or without Adenomyosis: A Case Series

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Abstract

Objective

Pain and bleeding are common problems among premenopausal patients with uterine fibroid. The aim of this study is to evaluate the central national institution experience and the clinical outcome of this procedure as a new modality of treatment for uterine fibroid with or without adenomyosis in symptomatic patients.

Methods

A retrospective cohort observational case series study of 28 Saudi patients, with symptomatic uterine fibroids who underwent uterine fibroid embolization from 2007 to 2014 was conducted. The baseline characteristics were analyzed, and the subsequent after the 48 hours and 6 months post-procedure, general estimating equation (GEE) logistic regression was used to model the probability of pain and bleeding while controlling for age.

Results

Of the 28 Saudi patients, 3 (10.7%) were successfully fertilized, and 4 (14.3%) had amenorrhea. The rates of symptoms were high at the baseline (before embolization): 96.4% had pain (dysmenorrhea), 96.4% had pressure feeling, and 85.7% had to bleed. Reduction in pain (dysmenorrhea like pain) was noted after the 48 hours after embolization (67.9%) and 6 months after embolization (64.3%). Differences in pain and bleeding by age was not significant (p -value > 0.05). The pain and bleeding were found to decrease after 48 hours (Relative Risk [RR] = 0.077, p -value = 0.0083; RR = 0.079, p -value < 0.0001 , respectively) and after 6 months (RR = 0.065, p -value = 0.0052; RR = 0.257, p -value < 0.0156 , respectively) after the embolization compared with baseline.

Conclusion

A decline in the symptoms was observed in all patients of the study, which indicates that the procedure is effective in improving health-related quality of life.

Keywords: Uterine Fibroid Embolization; Pain; Bleeding

Introduction

Uterine fibroid embolization is a nonsurgical treatment option for premenopausal symptomatic patients who wish to preserve their uterus, and suffered from the side effects of prolonged medical therapy, and refused surgery [1-2]. The procedure is based upon the hypothesis that bilateral reduction of uterine arterial blood flow will result in infarction of fibroids while sparing normal myometrium. Absolute contraindications are pregnancy, active genitourinary infection, and malignancy. Magnetic resonance imaging (MRI) allows making a differentiation of fibroids from other pelvic tumors [3]. Fibroid size, number, and location are three potential predictors of successful uterine fibroid embolization [4-6]. In addition, inpatient follow-up after embolization; MRI will be used to predict any regrowth of uninfarcted fibroid tissue [7-10].

The procedure is performed under local anesthesia as a day case, with a short period of recovery, the average procedure time is about an hour [11]. The most common approach to percutaneous embolization is via the right common femoral artery. Initially, an arteriogram is performed to visualize the pelvic vasculature, especially identification of the uterine artery, its origin, and the anatomic variations. Each patient should be counseled prior to the procedure about all possible complications and outcome [12]. Bilateral embolization results in ischemic necrosis and calcific degeneration of the fibroids [13-16]. Technical failure is rare <1% and is generally due to very difficult uterine artery anatomy, or dominant blood supply to fibroids from ovarian arteries [17]. All women will experience post-procedure pain related most likely to ischemia of the fibroids and uterus [18]. Serious complications are rare; mortality is rare and very less than that associated with hysterectomy [19-20]. Improvement of abnormal bleeding occurred in 85-94%, improvement of dysmenorrhea occurred in 77-79%, bulk-related symptoms were controlled in 60-96% [21], and mean uterine volume was reduced by 35-60% [22-24].

The reports of the type and rate of subsequences depend on whether the criteria used were from the Society of Interventional Radiology (SIR) or the American College of Obstetricians and Gynecologists (ACOG) [36]. An overview of them: fever (2-4%) readmission (2.4- 3.5%), need for unplanned surgical procedure (1- 2.5%), allergic reaction/rash (2.5%), hemorrhage (0.15- 0.75%), and life-threatening event (0.2- 0.5%) [25-28]. Submucosal myomas may become endocavitary, and be expelled vaginally [29]. Febrile morbidity may be related to endomyometritis with/without pyometra, salpingitis, tubo-ovarian abscess, infected fibroids, or infection at the groin insertion site. Some studies have reported a loss of ovarian function after uterine fibroid embolization [30]. Instances of premature menopause have been reported in 2-3% of patients [31].

The safety of pregnancy after uterine fibroid embolization has

not been established. The most reported consequences are a miscarriage, and placental abnormalities [32-35].

American College of Obstetricians has recommended uterine fibroid embolization as a safe and effective option for women who wish to retain their uterus [36]. No previous study had been performed to elaborate on uterine fibroid embolization in Saudi Arabia. The aim of this study is to evaluate the central national institution experience and the clinical outcome of this procedure as a new modality of treatment for uterine fibroid in symptomatic patients.

Methods

A retrospective cohort observational case series study of 28 Saudi women with symptomatic uterine fibroid who underwent uterine fibroid embolization from 2007 to 2014. The study was approved under protocol RC15/029 by our Institutional Board Review. The data were collected by review the charts, obtaining the symptoms in the baseline (before embolization), and the clinical subsequences after 48 hours, and 6 months after the procedure. The data analysis was performed using SAS 9.3. Univariate statistics were used to describe the characteristics of the patients pre and post-embolization (Table 1). General estimating equation (GEE) logistic regression was used to model the probability of pain (Table 2 & Figure 1) and bleeding (Table 3 & Figure 2) as a function of follow-up. Associations were considered significant at $p < 0.05$.

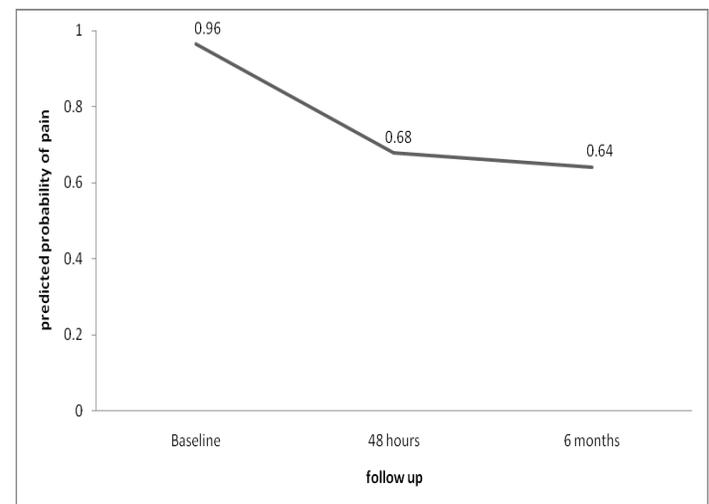


Figure 1. The predicted probability of pain after 48 hours and 6 months post-procedure.

Results

Baseline characteristics: A total of 28 Saudi patients who underwent embolization were included in the analysis. 18 (64.3%) were over the age of 40 while 10 (35.7%) were under the age of 40. MRI examination confirmed the diagnosis of fibroid 71.4%, and 28.6% with adenomyosis at the baseline

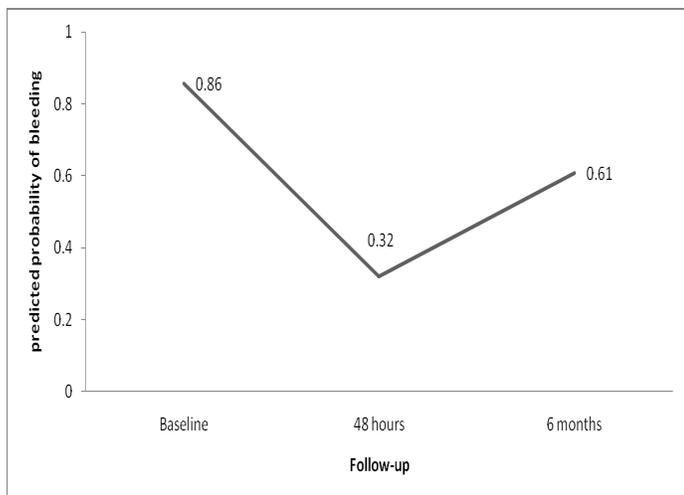


Figure 2. The predicted probability of bleeding after 48 hours and 6 months post-procedure.

(before embolization), the most common presenting symptoms were: pain (dysmenorrhea) (96.4%), pressure (96.4%), and bleeding (85.7%), subfertility, and low hemoglobin were encountered in 46.4%, and 50% of the samples, respectively. None of the patients had abnormal cervical smears or abnormal endometrial samples, Baseline data are summarized in Table 1.

Table 1. Characteristics of the patients who underwent embolization.

Characteristics	Levels	n	%
Demographic characteristics			
Age group	30-39 Yrs	10	35.7
	40-50 Yrs	18	64.3
Baseline findings			
MRI	Fibroid	20	71.4
	Fibroid/adenomyosis	8	28.6
Bleeding	Yes	24	85.7
Pain (dysmenorrhea)	Yes	27	96.4
Pressure	Yes	27	96.4
Subfertility		13	46.4
Hemoglobin	low	14	50.0
Cervical smear	Abnormal	0	0.0
Endometrial sample	Abnormal	0	0.0

Clinical findings after 48 hours after embolization:

Reported in Table 1: Improvement was found in respect to pain (dysmenorrhea like pain) (67.9%) and bleeding (32.1%) as compared to the baseline: pain (dysmenorrhea) (96.4%) and bleeding (85.7%). 21% had a fever, 10.7% passed fibroid tissue per-vagina, 42.9% required surgery, and 39.3% were re-admitted after 48 hours.

Clinical findings after 4 weeks to 6 months after embolization:

A decline of symptoms after the 6 months post-procedure was noted. 64.3% of the patients reported pain after the 6 months post-procedure, down from 96.4% at the baseline and 67.9% after 48 hours after the postprocedure. After the 6 months post-procedure, 60.7% of the women had to bleed, 14.3% had amenorrhea, and 10.7% achieved fertilization. The pressure feeling was declined to 89.3% of the samples, down from 96.4% at the baseline.

Clinical follow-up analysis:

Reduction in pain (dysmenorrhea like pain) after embolization was found to be correlated with the follow-up periods (Table 2). The GEE logistic regression model showed that after 48 hours, and 6 months post-procedure were associated with a reduction in pain. The pain was significantly decreased after 48 hours (relative risk [RR] = 0.077, p-value = 0.0083) and 6 months (RR = 0.065, p-value = 0.0052) post-procedure compared with baseline.

After 48 hours after embolization

Fever

Passing fibroid tissue	Yes	3	10.7
Required surgery	Yes	12	42.9
Re-admission	Yes	11	39.3
Pain (dysmenorrhea like pain)	Yes	19	67.9
Bleeding	Yes	9	32.1

After 4 weeks - 6 months after embolization

Pain(dysmenorrhea like pain)	Yes	18	64.3
Bleeding	Yes	17	60.7
Pressure	Yes	25	89.3
Amenorrhea occurred	Yes	4	14.3
Fertility improved	Yes	3	10.7

Table 2. Modelling proportion of pain as a function of follow-up.**Analysis Of GEE Parameter Estimates**

Parameter		Estimate	SE	95% CI		Z	Pr > Z
Intercept		3.07	0.85	1.4046	4.7361	3.61	0.0003
Follow up after	48 hours	-2.57	0.97	-4.4723	-0.6618	-2.64	0.0083*
Follow up after	6 months	-2.73	0.98	-4.6433	-0.8143	-2.79	0.0052*
Age	30-39 Yrs	-0.37	0.74	-1.8177	1.0815	-0.5	0.6187

*proportion of pain significantly decreased over time, compared to the baseline at $\alpha=0$.**Table 3.** Modeling proportion of bleeding as a function of follow-up.**Analysis Of GEE Parameter Estimates**

Parameter		Estimate	SE	95% CI		Z	Pr > Z
Intercept		2.23	0.72	0.8222	3.6396	3.1	0.0019
Follow up after	48 hours	-2.54	0.65	-3.8266	-1.2633	-3.89	<.0001*
Follow up after	6 months	-1.36	0.56	-2.4602	-0.2579	-2.42	0.0156*
Age	30-39 Yrs	-0.05	0.70	-1.4166	1.3163	-0.07	0.9426

*proportion of bleeding significantly decreased over time, compared to the baseline at $\alpha=0.05$.

No demographic variable was associated with pain (p-value > 0.05). Bleeding was significantly associated with the follow-up periods (Table 3). The risk of bleeding was found to decrease

after the 48 hours (RR = 0.079, p-value < 0.0001) and at 6 months it was (RR = 0.257, p-value < 0.0156) post-procedure compared with baseline. No demographic variable was associated with bleeding (p-value > 0.05).

Discussion

Uterine fibroid with or without adenomyosis is common among Saudi patients, who are reviewing gynecologic clinic, seeking to relief their pain (dysmenorrhea), pressure feeling, and vaginal bleeding, which affects their fertility, and socio-emotional issue. The prolonged use of medical therapy is caused intolerable side effects. The other traditional option in the management of uterine fibroid is myomectomy which is a major surgery, performed under general anesthesia, it carries, at least, the risk of anesthesia, bleeding, blood transfusion, and might be ended by hysterectomy which is unwanted for young woman planning for future pregnancy, long period hospitalization, and recovery.

Uterine fibroid embolization is a day case procedure, performed under local anesthesia, with the short recovery period. The most common approach to percutaneous embolization is via the femoral artery, a catheter is passed into the horizontal portion of one of the uterine arteries under fluoroscopic guidance, followed by infusion of the embolizing agent until blood flow to the fibroid ceases. This procedure results in ischemic necrosis and calcific degeneration of the fibroid. Technical failure is less than 1% and is generally due to very difficult uterine artery anatomy or dominant blood supply to fibroid from ovarian arteries. The average procedure time is about an hour. The most common subsequence of this procedure are a pain due to ischemia, fever, allergic reaction, the vaginal passage of a fibroid tissue, and re-admission required for management of any complication, and in some cases required surgery. Ovarian dysfunction manifested as transient or permanent amenorrhea. Uterine fibroid embolization recommended as the first line approach, and an option to treat their fibroid symptoms while also possibly preserving fertility. But need to be fully counseled as it might cause impairment of ovarian function which leads to subfertility.

This modern modality of management is considered a new concept among Saudi women, so our sample was 28 only within 6 years. Our results have matched the results of international studies, uterine fibroid embolization with or without adenomyosis is promising procedure has favorable short and long term outcome in order to be performed by experienced interventional radiologists.

Conclusion

A decline of the symptoms in all patients of the studied was observed, which indicates that the procedure is effective in improving the health-related quality of life.

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