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Intermediate and long-term outcomes following uterine artery fibroid embolization

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ABSTRACT

Objective: To assess patients' satisfaction and the intermediate and long-term patterns of symptom progression following uterine artery fibroid embolization (UAE).
Study design: Intermediate (2–6 years) and long-term (9–14 years) follow-up questionnaire survey to women who underwent UAE during the period 1996–2000, at a tertiary referral centre.
Results: The mean (SD) age of women at the time of embolization was 43 (5.58) years. A total of 142/197 (72.1%) women had the embolization in view of heavy menstrual periods, while 87/197 (44%) indicated a desire to retain fertility. 160/197 (81.7%) women who completed Q1 reported an improvement in menstrual symptoms compared to 41/80 (51.2%) for Q2 [$p < 0.01$]. The majority indicated they would recommend the procedure to a friend (Q1: 165 (83.8%), Q2: 62/80 (77.5%)) [$p = 0.75$]. 23/80 (28.8%) required further surgical treatment following UAE, and within the latter group, only 7/23 (30.4%) were satisfied with the embolization. 22/80 (27.5%) tried for a pregnancy following the procedure, and of these 3/22 (13.6%) had a live birth. The mean (SD) age at the menopause for women who returned Q2 was 49.1 (4.91) years.
Conclusions: The majority of women were satisfied with the embolization and noted an improvement in menstrual symptoms. However, this improvement diminished over time following the embolization, and over a quarter of women required further surgical intervention. Findings from this study may provide useful information in counselling women undergoing UAE and help guide clinicians in their patient selection criteria when discussing the procedure.

Introduction

Uterine fibroids are common amongst women in the reproductive age group with a reported incidence of 20–40% [1–3]. Women with symptomatic fibroids have traditionally been treated surgically, with removal of the uterus, or removal of the fibroids through a myomectomy procedure in those wishing to retain their uterus or preserve fertility. Uterine artery fibroid embolization (UAE) has emerged as an alternative to hysterectomy and myomectomy for women with fibroids [4–11]. It has now been used in the management of symptomatic uterine fibroids in clinical practice for over two decades [12–14], and it has been estimated that over 100,000 procedures have been performed worldwide since Ravina reported his series in France in 1995 [14–16].

UAE has been shown to be an effective alternative to hysterectomy and myomectomy in the management of women with fibroids [4,6–9,11,17]. Ravina et al. [18] reported a series of 88 women who were followed up for 5 years after UAE. The mean reduction in the fibroid size was reported to be 69%, and the success rate of the procedure was 89%, although the report did not specify the definition of their success rate. A total of 9 (10%) women subsequently underwent a hysterectomy (eight for pain and one for bleeding).

We carried out this review to assess the intermediate and long-term menstrual and reproductive outcomes as well as patient satisfaction following UAE.

Materials and methods

All women who underwent UAE during the period 1996–2000 were invited to complete an intermediate-term (2–6 years following the procedure) follow-up questionnaire [questionnaire 1 (Q1)], and subsequently the same group were sent a long-term

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(9–14 years following the procedure) follow-up questionnaire [questionnaire 2 (Q2)] to assess their satisfaction with the procedure and their symptoms following the embolization.

Bilateral uterine artery embolization was performed, using a standard technique and both uterine arteries were embolized to the point of near – total occlusion. Polyvinyl alcohol (PVA) particles (initially 300 u and subsequently 500 u) were used sometimes supplemented by Gel-foam particles [12].

Permission to conduct the study was obtained from the local ethics committee and the questionnaires were modelled on questionnaires used in previous studies conducted by the authors assessing similar outcomes. Using self-complete questionnaires, we assessed women's satisfaction with the procedure and their menstrual and reproductive outcomes following the embolization. Women were sent an information sheet explaining the study, and those who agreed to participate signed a consent form. They were asked to complete the study questionnaires and return them by pre-paid addressed envelopes.

The contact details for the patients were obtained from the Patient Information Management System (PiMs) and the National Health Service Spine Portal system and compared with the details provided by the patients at the time of their procedure. The study questionnaires were sent out to those who were still residing at the same address, while the current contact details for the remainder where obtained from their General Practitioners. The study questionnaires were sent out to all the women for whom we had confirmed current contact details.

Anonymized data were entered on a PC-held database and analyzed using the Statistical Package for Social Sciences (SPSS Version 19). Normally distributed data are presented as means and standard deviations. Comparisons were carried out using the Pearson Chi Squared test. Confidence intervals (95%) for the odd ratios were calculated and statistical significance was defined as p-value <0.05.

Results

A total of 197/273 (72.2%) women returned the intermediate-term follow-up questionnaires (Q1). We were able to confirm the current contact details for 124/197 (62.9%) women who had completed Q1 and the long-term follow-up questionnaires (Q2) were sent out to them. Of these a total of 80/124 (64.5%) women returned the long-term follow-up questionnaires. The mean (SD) interval between embolization and the return of Q1 was 3.3 (7.42) years [range 2–6 years], while that for the return of Q2 was 11.2 (1.28) years [range 9–14 years].

The characteristics of women included in the study are shown in Table 1. The mean (SD) age at the time of embolization was 43 (5.58) years and over half the women were Caucasian (questionnaire one: 104/197, 52.8%, questionnaire two: 49/80, 61.2%). None of the patients had repeat embolization. A total of 142/197 (72.1%) women had the embolization in view of their heavy menstrual periods, while 87/197 (44%) indicated a desire to retain their fertility. 160/197 (81.7%) women who completed Q1 reported an improvement in their menstrual symptoms compared to 41/80 (51.2%) of those who completed Q2 [$p < 0.01$]. 170/197 (86.3%) women who completed Q1 reported improvement in their general health following the procedure compared to 51/80 (63.8%) of those who completed Q2 [$p < 0.01$]. These findings are shown in Table 2.

A total of 3/197 (1.5%) women who completed Q1 had amenorrhoea following the procedure. Their age at the time of embolization was 50, 52 and 55 years old, respectively. A total of 35/197 (17.8%) reported fibroid expulsion. Of these, 15 had expulsion at home with no other symptoms, while 20 women reported vaginal discharge and pain with the expulsion.

Table 1
Patient characteristics for women who underwent uterine artery fibroid embolization.

Age (years) at procedure	Mean (SD)	43 (5.58)
Ethnicity *N* (%)		
White		104 (52.8%)
Black/Caribbean		47 (23.9%)
Black/African		32 (16.2%)
Mixed race		1 (0.5%)
Indian		4 (2.0%)
Oriental		3 (1.5%)
Hispanic		1 (0.5%)
Not documented		5 (2.5%)
Indication for UAE *N* (%)		
Heavy periods		142/197 (72.1%)
Abdominal distension/swelling		31/197 (15.7%)
Abdominal pain		15/197 (7.6%)
Urinary symptoms		9/197 (4.6%)
Desire to retain fertility *N* (%)		87/197 (44%)
Previous myomectomy *N* (%)		36/197 (18%)
Had children previously *N* (%)		71/197 (36%)
Symptoms before the procedure *N* (%)		
Heavy periods		148/197 (75%)
Abdominal distension/swelling		137/197 (69%)
Urinary symptoms		95/197 (48%)
Bowel symptoms		29/197 (15%)
Early follow up *N* = 197	Mean (SD)	3.3 (7.42)
(years after procedure)	Range	2–6 years
Age (years) at early follow up	Mean (SD)	46 (5.60)
Long-term follow up *N* = 80	Mean (SD)	11.2 (1.28)
(years after procedure) Range	Range	9–14 years
Age (years) at long-term follow up	Mean (SD)	53.5 (6.12)

N: numbers, SD: standard deviation.

Most women indicated they would recommend the procedure to a friend (165 (83.8%) Q1 and 62/80 (77.5%) Q2) [$p = 0.75$]. However, a higher proportion of the women who returned Q2 answered 'no' as opposed to 'not sure/no answer' [15/80 (18.8%) and 3/80 (3.8%), respectively], when compared to those who returned Q1 [10/197 (5.1%) and 22/197 (11.2%), respectively, $p < 0.01$ and 0.06, respectively].

A total of 165/197 (83.8%) women who completed the intermediate follow up questionnaires indicated they would recommend the procedure to a friend. If we assume that the entire remaining group of women who were lost to follow up were not happy with the procedure this figure would fall to 165/273 (60.4%). In addition a total of 62/80 (77.5%) women who completed the long term follow up questionnaires indicated they would recommend the procedure to a friend. If we consider that the entire remaining group of women who were lost to the long term follow up would not do so this figure would fall to 62/124 (50.0%).

In addition, a total of 58/80 (72.7%) women who completed the long term follow up questionnaires indicated they were satisfied with the procedure. If assumed that the entire remaining group of women who were lost to long term follow up were not happy with the procedure, then this figure would fall to 58/124 (46.8%).

A total 142/197 (72.1%) of women who completed Q1 reported a reduction in the size of their abdominal swelling/lump after the embolization, compared to 40/80 (50%) of those who completed Q2 ($p < 0.01$). A similar trend was noted with dysmenorrhoea and pelvic pain following the procedure [Q1: 135/197 (68.5%), Q2: 39/80 (48.8%), $p < 0.01$], and with the improvement in urinary symptoms following the procedure [Q1: 90/197 (45.7%), Q2: 19/80 (23.8%), $p < 0.01$]. These findings are shown in Table 3.

Although the majority of women [58/80 (72.7%)] who completed Q2 indicated that they were satisfied with the procedure, 23/80 (28.8%) required further surgical treatment following embolization. Only 7/23 (30.4%) of these women were satisfied with the procedure compared to 16/23 (69.6%) who expressed dissatisfaction with the embolization. Six women had surgery within two years of the embolization (one myomectomy