Clinical aspects of uterine artery embolization
Smeets, A.J.

Citation for published version (APA):

General rights
It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations
If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: http://uba.uva.nl/en/contact, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.
Smeets AJ, Lohle PN, Vervest HA, Boekkooi PF, Lampmann LE.
Cardiovasc Intervent Radiol 2006;29:188-91
MID-TERM CLINICAL RESULTS AND PATIENT SATISFACTION AFTER UTERINE ARTERY EMBOLIZATION IN WOMEN WITH SYMPTOMATIC UTERINE FIBROIDS
Abstract

Purpose
To evaluate mid-term clinical results and patient satisfaction following uterine artery embolization (UAE) in women with symptomatic fibroids.

Method
Between August 1998 and December 2002, 135 patients had UAE for symptomatic uterine fibroids. All patients were asked to fill in a questionnaire. Questions were aimed at changes in bleeding, pain and bulk-related symptoms. Symptoms after UAE were scored as disappeared, improved, unchanged or worsened. Adverse events were noted such as vaginal dryness and discharge, menopausal complaints or fibroid expulsion. Patient satisfaction after UAE was assessed. Patient satisfaction of women embolized with polyvinyl alcohol (PVA) particles was compared with satisfaction of women embolized with calibrated microspheres.

Results
The questionnaire was returned by 110 of 135 women (81%) at a median time interval of 14 months following UAE. In 10 women additional embolization or hysterectomy had been performed. Of the 110 responders, 86 (78%) were satisfied with the result of UAE. The proportion of satisfied women embolized with calibrated microspheres was higher compared to women embolized with PVA although this difference was not statistically significant (P=0.053).

Conclusion
UAE in women with symptomatic uterine fibroids leads to improvement of symptoms and patient satisfaction is good in the vast majority after a median follow-up period of 14 months.
Introduction

Uterine fibroids (leiomyomas) are common benign tumors in women of child-bearing age with an incidence of 20-40%. In 10-20% of women these uterine fibroids lead to symptoms such as bleeding, pain and bulk-related symptoms (1). Standard methods of treatment comprise medical treatment or surgery such as myomectomy or hysterectomy. Uterine artery embolization (UAE) was introduced in 1995 by Ravina and Merland (2) as an alternative treatment for women with symptomatic fibroids.

In this retrospective study, we present mid-term clinical results and patient satisfaction after UAE in 110 women with symptomatic uterine fibroids. In the literature there are only limited reports on mid-term clinical results and patient satisfaction after UAE (3-5).

Materials and Methods

General

Prior to embolization, all patients were examined by a gynecologist. All women had symptomatic uterine fibroids with an indication for hysterectomy. All women had undergone one or more of the following treatments without sufficient result: iron supplements, oral contraceptives, various hormone treatments (including GnRH analogues), curettage, endometrium-ablation, myomectomy and homeopathic treatment. Exclusion criteria for embolization were pregnancy, suspected or confirmed gynecological malignancy, avascular calcified fibroids, infection, predominant adenomyosis or thin-stemmed pedunculated fibroids - where the stem diameter is less than 1/3 of the diameter of the fibroid (6).

Informed patient consent was obtained in all women after the embolization procedure was explained including discussing the possible advantages and disadvantages of the procedure, the risks and the expected results. Prior to embolization, all patients had a diagnostic hysteroscopy to exclude intracavitary pathology. Pelvic MRI was performed in all women before treatment.
Embolization procedure

With a 4 French braided Cobra (C2) catheter the left uterine artery (UA) was selectively catheterized. A coaxial microcatheter was then positioned in the horizontal part of the UA, preferably distally to the cervicovaginal branches. The embolization material consisted of calibrated microspheres (Embogold or Embosphere, Biosphere Medical Roissy, France) or non spherical polyvinyl alcohol (PVA) particles (Contour, Boston Scientific, Freemont CA) (7,8). The aim of embolization was to occlude the branches to the fibroid without complete occlusion of the uterine artery. After embolization of the left UA, the catheter was guided into the right UA by means of the Waltman loop manoeuvre and the right UA was embolized (9,10). In women who wanted to conceive, both femoral arteries were punctured and embolization was performed by two radiologists simultaneously in order to limit radiation exposure of the gonads (11). The patients were scheduled for one night of clinical observation. Pain was controlled by administering 10 mg Morphine intramuscularly, Voltaren 100 mg supp and when necessary Paracetamol or a PCA (patient controlled analgesia) pump. Nausea was treated intravenously with Lithican or Zofran.

Questionnaire

In January 2003, all women embolized between August 1998 and December 2002 received a questionnaire. The questions were aimed at changes in bleeding (menorrhagia and metrorrhagia), pain (dysmenorrhoea, dyspareunia, backpain, pain in the legs and pelvic pain) and bulk-related symptoms (size of abdomen, constipation, urinary frequency and suprapubic pressure). Symptoms after UAE were scored as disappeared, improved, unchanged or worsened. In addition, adverse events were noted such as vaginal dryness and discharge, menopausal complaints or fibroid expulsion. Patient satisfaction after UAE was assessed by the following questions: how would you score your quality of life (improved, unchanged or worse)? Would you opt for the same treatment in retrospect? Would you recommend UAE to a friend?

The patients were also asked whether hysterectomy or additional embolization was performed after the initial embolization. In these cases the women were asked to score their symptoms and satisfaction prior to these additional treatments.
Comparison of embolic agents

Patient satisfaction of women embolized with non spherical PVA particles was compared to women embolized with calibrated microspheres. Statistical analysis was performed using the Chi-square test. P-values <0.05 were considered statistically significant.

Results

Between August 1998 and December 2002, 135 consecutive patients with symptomatic uterine fibroids were embolized. Mean age was 42.9 years, median 44 years, range 25-53 years. (Fig. 1)

![Figure 1. Patient's age (average 43 years; range: 25-52 year)
The questionnaire was returned by 110 of 135 women (81%). Mean time interval between embolization and return of the questionnaire was 15.8 months (median 14 months, range 2 to 52 months). Table 1 shows the symptoms of the 110 women before and median 14 months after treatment. In 3 women additional embolization was needed and 6 women had undergone hysterectomy because of insufficient results after initial UAE. One woman underwent hysterectomy after second UAE because of suspected malignancy on follow-up MRI. Pathological examination revealed a fibroid.

Table 1. Symptoms of the 110 patients before and at a median follow-up of 14 months after UAE

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>before embolization</th>
<th>after embolization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>disappeared</td>
<td>improved</td>
</tr>
<tr>
<td><strong>Bleeding</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>menorrhagia/metrorrhagia</td>
<td>98</td>
<td>28 29%</td>
</tr>
<tr>
<td>anaemia</td>
<td>46</td>
<td>27 59%</td>
</tr>
<tr>
<td><strong>Pain</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dysmenorrhoea</td>
<td>55</td>
<td>15 27%</td>
</tr>
<tr>
<td>dyspareunia</td>
<td>24</td>
<td>12 50%</td>
</tr>
<tr>
<td>back pain</td>
<td>45</td>
<td>12 27%</td>
</tr>
<tr>
<td>pain in legs</td>
<td>31</td>
<td>11 35%</td>
</tr>
<tr>
<td>pelvic pain</td>
<td>36</td>
<td>11 31%</td>
</tr>
<tr>
<td><strong>Bulk related</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>size of abdomen</td>
<td>66</td>
<td>14 21%</td>
</tr>
<tr>
<td>constipation</td>
<td>17</td>
<td>1 6%</td>
</tr>
<tr>
<td>pollakisuria</td>
<td>48</td>
<td>15 31%</td>
</tr>
<tr>
<td>supra pubic pressure</td>
<td>58</td>
<td>20 34%</td>
</tr>
<tr>
<td><strong>Various</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>vaginal dryness</td>
<td>7</td>
<td>1 14%</td>
</tr>
<tr>
<td>vaginal discharge</td>
<td>28</td>
<td>4 14%</td>
</tr>
</tbody>
</table>
Menorrhagia and metrorrhagia disappeared in 29% or improved in 50% of the women respectively, while symptoms of anaemia disappeared in 59% and improved in 28%. A substantial improvement or complete disappearance was seen for all kinds of pain symptoms. However, there was a mediocre response following embolization with regard to pain in the legs. Only 58% of the 31 women who had this complaint before embolization stated that this symptom had disappeared (35%) or improved (23%). Bulk-related problems disappeared to the same degree as bleeding and pain symptoms. In various other complaints the response was less favourable. Some patients experienced new (mild) symptoms not present before UAE.

Of the 110 responders, 86 (78%) were satisfied after UAE. Ten women (9%) were satisfied nor unsatisfied (unchanged) and 14 women (13%) were unsatisfied. Eighty of the 110 women (72%) would opt for the same treatment and 92 (83%) would recommend this treatment to a friend. These results included the 10 women who had additional therapy after initial UAE and were unsatisfied with the initial result.

Temporary amenorrhoea was reported by 19 (17%) women and persisted for up to 6 months following embolization. Permanent amenorrhea was reported by 3 women (47, 49 and 50 years of age). None of the 110 patients experienced vaginal dryness after embolization. Vaginal discharge was reported as an adverse event by two patients. Spontaneous vaginal expulsion of a fibroid occurred in 4 women (3.6%) without further complications.

In 107 patients (97%) bilateral embolization was technically successful; in one patient it was not possible to embolize both uterine arteries from a unilateral approach. The proportion of the 71 women embolized with calibrated microspheres that were satisfied (84.5%) was higher than that of 39 women embolized with non spherical PVA (66.6%) but this difference was not statistically significant (P=0.053).
Discussion

The purpose of the embolization was treatment of the symptoms caused by the uterine fibroids by means of devascularization of all fibroids. Devascularization is achieved by occlusion of the arterial branches to the fibroids with embolic agent. Devascularization and the subsequent decrease in volume of the uterus and fibroid results in elimination or improvement of the patient’s symptoms.

In this retrospective study with mid-term clinical follow-up, UAE was a safe and effective treatment for symptomatic uterine fibroids. The uterus was preserved in 128 of 135 women (95%). At a median follow-up of 14 months, improvement of clinical symptoms was apparent in the vast majority of women and patient satisfaction was high. This is in concordance with previous studies (3-5,12,13). Of 110 women, 14 women (13%) were unsatisfied and 10 had additional therapy. Seven of the 135 embolized patients have had a hysterectomy after UAE; this proportion is similar to that reported in other studies (14).

Inadequate devascularization may occur when other arterial branches feed the fibroid such as anastomoses from the ovarian artery (12,15). Incomplete devascularization may also occur when it is not possible to embolize both uterine arteries. In our study this happened in three patients, nevertheless all were satisfied with their clinical outcome.

Adverse events were limited. Temporary amenorrhea following UAE was reported in 17% and permanent amenorrhea in 3%. Temporary or permanent amenorrhea as a result of ovarian infarction or ischemia may occur when part of the embolization material reaches the blood supply to the ovaries via shunts from the uterine artery. This occurs predominantly in women over the age of 45 where blood supply to the ovary is marginal and ovaries appear to be more vulnerable (16,17). All 3 women in our series developing permanent amenorrhea were over 45 years of age. If shunts to the ovary are identified, we upsize to a larger particle or microsphere unlikely to pass through these small utero-ovarian shunts (9,13).
Vaginal dryness was not reported by any of the responders in our study. Vaginal dryness due to atrophy of the vaginal mucosa may occur when the embolization material obstructs the vaginal branches of the UA. Vaginal discharge was only reported by 2 women as a new symptom after UAE. It has been postulated that vaginal discharge may be associated with submucosal location of the fibroids and may precede spontaneous vaginal expulsion of a fibroid (18); Fibroid expulsion or myoma nascens is a well known fact from literature (19); in our study spontaneous vaginal expulsion of a fibroid occurred in 4 (4%) patients without further complications.

There was a tendency for higher patient satisfaction with the use of calibrated microspheres compared to non spherical PVA as an embolic agent. This difference however was not statistically significant. In a previous study comparing both embolic agents, no significant difference was found either (20).

Of the 135 embolized women 110 have returned the questionnaire. Of the 25 patients who did not return the written questionnaire, 21 had a follow-up MRI. Each MRI was combined with a consultation with an interventional radiologist who collected the data. Thus, some information was available. These 21 women had no complications after UAE and none underwent a hysterectomy. These women were generally positive about UAE: 16 of 21 women with MRI follow-up would opt for the same treatment again.

The limitation of this retrospective study is the questionnaire we used; it was homemade, based on the experience we built up over time with this category of patients. Disease-specific Quality of Life questionnaires were unsuitable, because these have to be filled in prospectively several times so as to be able to assess experiences over a period of time, whereas our study consisted of a once-only retrospective questionnaire. Various authors have postulated that UAE is no longer experimental; it is an effective therapy for fibroids and has to be considered in every patient suffering from fibroids (21,22). Our study also shows that UAE in women with symptomatic uterine fibroids leads to improvement of symptoms and patient satisfaction is good in the vast majority after a median follow-up period of 14 months.
References


