Management of Uterine Artery Embolization for Fibroids as an Outpatient Procedure

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PURPOSE: To evaluate whether it is safe to perform uterine artery embolization (UAE) as an outpatient procedure.

MATERIALS AND METHODS: This retrospective study was approved by the institutional review board and included 234 patients (age range, 24–58 years; mean age, 40.5 years) who underwent UAE as an outpatient procedure with polyvinyl alcohol particles between January 2007 and March 2008. Patients were given acid-suppressing drugs, nonsteroidal anti-inflammatory drugs, anti-histaminic drugs, and laxatives twice on the day before UAE and once on the morning of UAE. Pain score, rated from 0 to 10, was evaluated by using a numeric pain scale during UAE, after the procedure, at discharge, at the night of discharge, and on the following morning. The outcome of UAE was evaluated at 6 months by means of pelvic magnetic resonance imaging and clinical observation.

RESULTS: The mean pain score was 0.9 during embolization, 2.5 4–8 hours after embolization, 0.9 at discharge, 1.1 the first night after discharge, and 0.7 the next morning. All patients were discharged from the hospital 4–8 hours after the procedure, with no overnight hospital admissions. At 6 months, 146 of 158 patients (92.4%) reported an improvement in menorrhagia, 39 of 44 (88.6%) reported an improvement in bulk symptoms, and 20 of 25 (80%) reported an improvement in pain. The volumes of the uterus and the dominant fibroid decreased 33.7% and 39.3%, respectively.

CONCLUSIONS: With acid-suppressing, anti-inflammatory, and anti-histaminic drugs started on the day before UAE, the procedure can be performed safely as an outpatient procedure.

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Abbreviation: UAE = uterine artery embolization

MANY patients have postembolization syndrome after uterine artery embolization (UAE). Postembolization syndrome consists of nausea, vomiting, pelvic pain, low-grade fever, fatigue, and general malaise in the 1st hours after the procedure (1). The pain is due to fibroid ischemia and transient ischemia of the normal myometrium. It is expected that there will be some correlation between the volume of tissue infarcted and the severity of this syndrome. However, the severity of this pain is largely unpredictable (2).

There are other postembolization symptoms associated with UAE in the days following the procedure, such as abdominal swelling, constipation, fever, vaginal bleeding, pain, nausea/vomiting, anorexia, or fatigue. Because most patients will experience 4–5 days of postprocedural symptoms, most centers where UAE is performed admit their patients for 1–2 days in the hospital after the procedure for abdominal pain or vomiting control (3–5).

Since the first reports on UAE for the treatment of uterine fibroids, most subsequent studies have indicated that patients should be hospitalized at least overnight for pain control. However, some authors have started to perform UAE successfully, sending the patients home on the day of the procedure (6,7).

There are simplified protocols for pain control that reduce symptoms, with the average pain being described as mild cramping, and many patients describe having no pain at all (2,3,5,8–10). There is a trend in medicine to shift toward ambulatory care, both to increase patient satisfaction and to reduce health care costs. To perform UAE as an outpatient procedure, an effective postembolization medication must be provided to patients (9).

This retrospective study intends to evaluate whether it is possible to per-

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form UAE safely as an outpatient procedure, without increasing complications, by starting acid-suppressing and anti-inflammatory drugs before the procedure.

MATERIALS AND METHODS

From January 2007 to March 2008, we conducted a retrospective study in patients who were treated with UAE and discharged on the same day (outpatients). We treated 238 patients during this time period. Four patients were excluded because they were admitted for overnight stay at the hospital (inpatients). Two of those patients were admitted because they preferred to stay in the hospital, and the other two patients were admitted because they had severe pain that persisted for 8 hours after UAE. The remaining 234 patients were discharged on the same day (outpatients) and are included herein. There were no other exclusion criteria. The patients were consecutive referrals.

The main indications for UAE were menorrhagia, bulk-related symptoms, and pain. There were no cases of concomitant adenomyosis. Patients seeking future fertility were not excluded. The study was approved by the institutional review board. All patients gave written informed consent.

Contrast medium-enhanced pelvic magnetic resonance (MR) imaging was performed in every patient before embolization to evaluate the baseline volume of the uterus and the largest fibroid (volume = length × depth × width × 0.5233). Contrast-enhanced pelvic MR imaging was performed by using a 1.5-T system (Philips, Hamburg, Germany). Axial, sagittal, and coronal imaging examinations were performed with turbo spin-echo T2-weighted imaging. T1-weighted axial and sagittal MR images were obtained before and after gadolinium injection (2 mL/sec). MR angiography was performed with specific software to detect contrast medium uptake by the fibroid. There were no exclusion criteria for MR imaging.

As pre-embolization medication, the patients took, on the previous day at home (at breakfast and dinner) and on the day of UAE (at breakfast), an acid-suppressing drug (omeprazole, 20 mg [Bluepharma; Coimbra, Portugal]), an anti-inflammatory (naproxen, 1,000 mg [Naprosyn; Roche]), an anti-histaminic (hydroxizine, 25 mg, [Atarax, UCB]), and a stool softener (sodic docusate and sorbitol, 10 mg and 1,340 mg as suppositories [Clyss–Go; Prospa]) (**Table 1**).

Table 1
Medication for UAE

- Day before (twice a day) and morning of UAE
  - Acid-suppressing drug (omeprazole, 20 mg by mouth)
  - Anti-inflammatory drug (naproxen, 1,000 mg by mouth)
  - Anti-histaminic (Hydroxizine, 25 mg by mouth)
  - Stool softener (Clyss-Go, as suppositories)
- Day of UAE
  - Before embolization
    - Anxiolytic (diazepam, 5 mg sublingually)
    - Acid-suppressing drug (omeprazole, 20 mg IV)
    - Analgesic drugs
    - Metamizol (2 g IV)
    - Tramadol (100 mg IV)
    - Antiemetic drugs
    - Metoclopramide (25 mg IV)
    - Droperidol (0.10 mg IV)
    - Anti-inflammatory (piroxicam, 20 mg IV)
    - Antibiotic (cefazolin, 1g IV)
  - During embolization
    - Anti-inflammatory (ketorolak, 30 mg IV x 2)
    - Anxiolytic (midazolam, 1mg IV if needed)
  - After embolization
    - Acid-suppressing drug (omeprazole, 20 mg IV)
    - Analgesic drugs
    - Paracetamol, 1g IV
    - Metamizol, 2 g IV
    - Anti-inflammatory drugs
    - Ketorolak, 30 mg IV
    - Piroxicam, 20 mg IV
    - Antiemetic drugs
    - Metoclopramide, 25 mg IV
    - Ondansetron, 2 mg IV
  - Just before discharge
    - Analgesic (Tramadol, 100 mg IV)
    - Antiemetic (Metoclopramide, 25 mg IV)

Note.—IV = intravenously.

Just before embolization, the patients received an ansiolytic (diazepam, 5 mg sublingually [Ratiopharm]), an acid-suppressing drug (omeprazole, 20 mg intravenously), analgesics (metamizol, 2 g intravenously [Nolotil, Boehringer Ingelheim]; and tramadol, 100 mg intravenously [Tramal, Grunental]), antiemetics (metoclopramide, 25 mg intravenously [Primperan, Sanofi-Aventis]; and droperidol, 0.10 mg intravenously [Janssen Cilag]), an anti-inflammatory (piroxicam, 20 mg intravenously [Felden Pfizer]), and an antibiotic (cefazolin, 1 g intravenously [Bristol Myers Squibb; Paço de Arcos, Portugal]).

During embolization, an anti-inflammatory (ketorolak tromethamine, 30 mg intravenously [Toradol, Roche]) was administered twice before the embolization of each uterine artery (total amount, 60 mg). Intravenous midazolam (Labesfal, Campo de Besteiros, Portugal; 1 mg) was administered if necessary.

Embolization was performed with the patient under local anesthesia by using the right femoral artery approach with a single 5-F cobra-shaped catheter and hydrophilic guide wire. Four interventional radiology physicians conducted the procedures, one of whom (J.M.P.)—with 32 years of experience in intervention and 5 years of experience in UAE—was present in all cases. He was assisted by three other physicians, one with 10 years of experience in intervention and 5 years of experience in UAE (D.S.), another with 5 years of experience in intervention and UAE (M.D.), and another with 3 years of experience in intervention and UAE (T.B.). A microcatheter was used only when necessary. To catheterize the right uterine artery, the Waltman loop was formed. Both uterine arteries were embolized with nonspherical polyvinyl alcohol particles (Contour; Boston Scientific, Boston, Massachusetts, and Lisbon, Portugal) mixed with 100-mg ketoprofen. We started the embolization with a vial of 300–500-μm polyvinyl alcohol particles for each uterine artery and completed it with 500–700-μm polyvinyl alcohol particles, recording of the amount of embolic material used in each patient. The endpoint chosen for embolization was slow flow or "near stasis" in the main uterine artery (11), as shown by nonfilling of the arterial branches to the fibroids, the interruption of the flow in the uterine artery, or reflux of the contrast medium toward the origin of the uterine artery.

Aortography was not performed at the end of the procedures, and no arterial closure devices were used. After UAE, local compression for 5 minutes and compressive bandages were used and patients were allowed to deambulate 3 hours after embolization. There

was no use of bladder catheterization at the time of the embolization procedure.

After embolization, the patients received the following medication: acid-suppressing drug (20-mg omeprazole intravenously), analgesics (1-g paracetamol [Bristol Myers Squibb] and 2-g metamizol, both given intravenously), anti-inflammatory (30-mg ketorolak tromethamine and 20-mg piroxicam, both given intravenously), and antiemetics (25-mg metoclopramide and 2-mg ondansetron [Hikma], both given intravenously).

Two to 3 hours after the procedure, all asymptomatic patients and those with mild symptoms without nausea or vomiting had a light meal, started oral medication with 37.5-mg tramadol and 325-mg paracetamol (Zaldiar) and discharged from the hospital 4–8 hours after the procedure. Just before discharge, 100-mg tramadol and 25-mg metoclopramide were intravenously administered to every patient.

Four to 8 hours after embolization, patients with no symptoms, mild to severe pain, only light fatigue, anorexia, abdominal swelling, or minor vaginal bleeding were considered for discharge.

During embolization, immediately after the procedure, and every 2 hours thereafter up to discharge, at discharge, the night of discharge, the following morning, and on a daily basis for the next 7 days, the patients were asked to rate verbally their pain severity by using a numeric pain score scale rated from 0 (sensation of no pain) to 10 (the worst pain). Pain was classified as follows: no pain (score, 0), light pain (score, 1–2), moderate pain (score, 3–5), severe pain (score, 6–7), and very severe pain (score 8–10) and recorded in a sheet, as described by Huskisson (12). The peak pain score was recorded from each patient. The other symptoms were also recorded. The symptoms were registered in a sheet by the patient or with the help of an accompanying person or a nurse.

The night of embolization, at home, the patients took 20-mg omeprazole, 25-mg hydroxizine, and 500-mg naproxen. As on-demand medication, the patients were given 37.5-mg tramadol plus 325-mg paracetamol (Zaldiar) and 30-mg codeine plus 500-mg paracetamol (Dol-U-Ron; Neo-Framaceutica, Lisbon, Portugal) by mouth for pain and 100-mg dimenhydrinate (Enjomin; Codilab, Lisbon, Portugal) as suppositories for vomiting.

The day after the procedure, the patients started oral medication with 20-mg omeprazole twice a day, 250-mg levofloxacine (Tavanic; Sanofi-Aventis) twice a day, 500-mg naproxen twice a day, and Clyss-Go when needed (as suppositories) and were advised not to stay in bed.

At first consultation, at admission to the hospital, and at discharge, the patients were informed both verbally and in a written form about the postembolization constitutional symptoms they could expect and the corresponding medication. At discharge, the patients were given the mobile phone number of the interventional radiologists and two questionnaires—one to be filled out daily for a week and one to be filled out 6 months after the procedure. The patients were questioned about their satisfaction with their time of discharge, the fibroid-related symptoms, and the quality of life they had before and after UAE. After being filled, the score sheets were mailed in.

The overall results of embolization were evaluated 6 months after the procedure with contrast-enhanced pelvic MR imaging, evaluation of the answers to the questionnaires, and clinical observation in every patient.

RESULTS

UAE was performed as an outpatient procedure in 234 patients aged 24–58 years (mean age, 40.5 years). Two hundred sixteen patients were white and 18 were Black. **Table 2** shows the main symptoms of the patients and the baseline data. The technical success rate for bilateral UAE was 98.7% (231 of 234 patients). In three patients, only one uterine artery was embolized due to the small size, spasm, and tortuosity of the other uterine artery. Seventeen patients were lost to follow-up, and all remaining patients completed the multiple questionnaires given. All patients took the medication as described on the day before embolization, although there were no collected data regarding their compliance after UAE and the total amount of medication used. The mean total volume of polyvinyl alcohol particles used per patient was 3.68 mg.

The mean pain score (rated from 0 to 10) was evaluated, so that during embolization 142 patients did not report any pain, 67 reported a pain score of 1–2, 23 reported a pain score of 3–5, and two reported a pain score of 6–7 (**Table 3**). The mean pain score was 0.9.

Table 2
Summary of Baseline Data

Variable	Value
Mean patient age (y)	40.5
Age range (y)	24–58
Main symptoms	
Menorrhagia	158 (67.5)
Bulk symptoms	44 (18.8)
Pain	25 (10.7)
Mean uterine volume (cm^3)	448.7
Mean fibroid volume (cm^3)	110.5
No. of fibroids	
1	54 (23.1)
2–5	87 (37.2)
>5	93 (39.7)
Location of dominant fibroid	
Subserosal	31 (13.2)
Intramural	178 (76.1)
Submucosal	25 (10.7)

Note.—Except where indicated, data are given as number of patients. Numbers in parentheses are percentages.

After embolization and before discharge, 54 patients did not feel any pain, 42 reported a pain score of 1–2, 109 reported a pain score of 3–5, 23 reported a pain score of 6–7, and six reported a pain score of 8–10. The mean pain score was 2.5. At discharge, 96 patients did not report any pain, 132 reported a pain score of 1–2, and six reported a pain score of 3–5. The mean pain score was 0.9. The other symptoms at discharge were fatigue in 17 patients, anorexia in 16, abdominal swelling in 13, and minor vaginal bleeding in nine (only blood spots without continuing blood loss, need for extra pads, or hemodynamic instability) (**Table 4**).

All patients were discharged from the hospital 4–8 hours after the procedure, and the mean number of hours before discharge after UAE was 6.8 (range, 4–8 hours).

At home, on the night of discharge, 85 patients reported having no pain, 139 reported a pain score of 1–2, six reported a pain score of 3–5, and four reported a pain score of 6–7. The mean pain score was 1.1.

On the morning after embolization, 102 patients had no pain, 121 had a pain

Table 3
Summary of Pain Scores

Pain Score	No. of Patients (n = 234)
During UAE	
No pain (0)	142 (60.7)
Light pain (1–2)	67 (28.6)
Moderate pain (3–5)	23 (9.8)
Severe pain (6–7)	2 (0.9)
Mean pain score	0.9
Before discharge	
No pain (0)	54 (23.1)
Light pain (1–2)	42 (17.9)
Moderate pain (3–5)	109 (46.6)
Severe pain (6–7)	23 (9.8)
Very severe pain (8–10)	6 (2.6)
Mean pain score	2.5
At discharge	
No pain (0)	96 (41.0)
Light pain (1–2)	132 (56.4)
Moderate pain (3–5)	6 (2.6)
Severe pain (6–7)	0
Mean pain score	0.9
Night of discharge	
No pain (0)	85 (36.3)
Light pain (1–2)	139 (59.4)
Moderate pain (3–5)	6 (2.6)
Severe pain (6–7)	4 (1.7)
Mean pain score	1.1
Morning after UAE	
No pain (0)	102 (43.6)
Light pain (1–2)	121 (51.7)
Moderate pain (3–5)	11 (4.7)
Mean pain score	0.7

Note.—Numbers is parentheses are percentages.
*Numeric pain score was graded on a scale of 0 to 10.

Table 4
Summary of Postembolization Data

Symptoms	No. of Patients (n = 234)
At discharge	
Light pain (1–2)	132 (56.4)
Moderate pain (3–5)	6 (2.6)
Fatigue	17 (7.3)
Anorexia	16 (6.8)
Abdominal swelling	13 (5.6)
Vaginal bleeding	9 (3.8)
Morning after UAE	
No pain (0)	102 (43.6)
Light pain (1–2)	121 (51.7)
Moderate pain	11 (4.7)
Fatigue	23 (9.8)
Anorexia	21 (9.0)
Vaginal bleeding	18 (7.7)
Abdominal swelling	26 (11.1)

Note.—Numbers in parentheses are percentages.

score of 1–2, and 11 had a pain score of 3–5; the mean pain score was 0.7. The other symptoms reported the morning after UAE were fatigue in 23 patients, anorexia in 21, vaginal bleeding in 18, and abdominal swelling in 26.

During the next 7 days after UAE, 20 patients had abdominal swelling, 14 had constipation, and seven reported low-grade fever.

The mean time between the day of the procedure and return to work was 7.3 days (range, 2–13 days); 233 of the 234 patients (99.6%) were satisfied with the time of discharge. One patient who had severe pain the night of discharge was not satisfied.

As minor complications, apart from pain, there was nausea/vomiting in 26 patients, fatigue in 23, anorexia in 21, vaginal bleeding in 18, abdominal swelling in 26, and small inguinal hematomas in five. As major complications, there were four fibroid expulsions at 2, 3, 5, and 6 months after embolization, without any sequel. The fibroid expulsions were treated with antibiotics (100-mg Vibramicine [Pfizer, Lisbon, Portugal] every 12 hours; 500-mg Amoxicillin and Clavulanate-Augmentin [GlaxoSmithKline, Alges, Portugal] every 8 hours) plus analgesics (Zaldiar, every 8 hours) and an anti-inflammatory (Naprosyn, every 12 hours) for 5 days and were self-limited. No major blood loss, infections, or other associated complications occurred, and there was no need for medical assistance in any case.

There were eight patients who started a period of amenorrhea after embolization (3.4%). The patients were all older than 46 years and the period of amenorrhea lasted 4.5 months in six patients and became permanent in two. There were no drug sensitivities or allergic reactions to the medication or contrast media used.

Six months after embolization, there was an improvement of menorrhagia in 146 of 158 patients (92.4%), an improvement of bulk-related symptoms in 39 of 44 (88.6%), and an improvement of pain in 20 of 25 (80.0%). Only 12 of 158 patients (7.6%) had persisting menorrhagia, five of 44 patients (11.4%) had persisting bulk-related symptoms, and five of 25 patients (20.0%) had persisting pain (**Table 5**). The mean uterus and dominant fibroid volumes decreased 33.7% and 39.3%, respectively. The mean uterine volume was 297.5 cm^3 after UAE and 448.7 cm^3 before UAE, for a decrease of 66.3%. The mean dominant fibroid volume was 67.1 cm^3 after UAE and 110.5 cm^3 before UAE, for a decrease of 60.7% (**Table 6**).

DISCUSSION

To perform UAE as an outpatient procedure, it is important to control the postembolization symptoms—particularity pain and vomiting—and the patients should be informed about those symptoms and the corresponding medication.

With good information and specific medication started before the procedure, pain and vomiting are easily controlled and the patients can be safely released from the hospital 4–8 hours after UAE.

In this study, we were able to perform UAE as an outpatient procedure in 234 patients and control pain during and after UAE, with a maximum mean pain score of 2.5 (rated from 0–10) during the first 8 hours after embolization. After embolization and before discharge, 54 of the 234 patients (23.1%) did not feel any pain, proving the efficacy of the anti-inflammatory (Naprosyn) medication started on the day before and the analgesic association given during and after the procedure. There were only two cases of severe pain (pain score, 6–7) during UAE (0.9%), and 29 patients with severe (pain score, 6–7) or very severe (pain score, 8–10) pain before discharge (12.4%). Patients with severe or very severe pain after UAE were offered the option of staying overnight in the hospital for pain control, but as the pain decreased in the following hours, they preferred to be discharged with the oral medication given. At discharge, the maximum pain intensity felt by patients was moderate pain (pain score of 3–5 in six patients), with no cases of vomiting. Four patients were excluded from this study because they were treated with overnight hospital admission (inpatients). Two patients were treated as inpatients per their request (despite having no severe postembolization symptoms), and the remaining two patients were hospitalized due to persisting severe pain. Thus, we were able to perform UAE as an outpatient proce-

Table 5
Clinical Outcome of UAE at Six Months

Outcome	No. of Patients		Percentage
	Before UAE	After UAE	
Menorrhagia	158	12	7.6
Bulk symptoms	44	5	11.4
Pain	25	5	20.0

Note.—Percentages of number of patients with persisting symptoms after UAE.

Table 6
Mean Uterus and Fibroid Volumes at Six Months

	Before	After	
Uterine volume (cm^3)	448.7	297.5	(66.3)
Dominant fibroid volume (cm^3)	110.5	67.1	(60.7)

Note.—Data are given as volumes. Numbers in parentheses are percentages.

dure in almost all patients treated from January 2007 to March 2008.

Like Baerlocher et al (9), we had no re-admissions. Goodwin and Walker (7), however, described 34% of re-admissions for pain control. In a subsequent study (7), they had to admit only 15% of their patients because of fever. Klein and Schwartz (6) had a re-admission rate of 9%, and Al-Fozan et al (5) had a re-admission rate of 19% for pain or fever control. We think that, with the medication given in our protocol, pain, vomiting, and fever can be controlled effectively. It is important, however, to provide the patients with good information about the symptoms they can expect during the days following UAE and the corresponding medication and to tell them to contact the interventional radiologist in case of need or any doubt. Total availability to assist the patient is paramount to avoid complications or re-admissions and to ensure patient confidence.

Postembolization symptom control is the clinical challenge to perform UAE as an outpatient procedure (5). Several different strategies have been used in an attempt to manage the pain, nausea, and vomiting associated with UAE (6–9,11).

Goodwin and Walker (7) were the first to perform UAE as an outpatient procedure. They used intravenous or intramuscular ketorolak before, during, and after the procedure and midazolam or fentanyl during the procedure associated with narcotics, nonsteroidal anti-inflammatory drugs, and antiemetics (7).

Baerlocher et al (9) used morphine sulphate through a controlled analgesic pump. After discharge, pain was controlled with nonsteroidal anti-inflammatory drugs and narcotic analgesic drugs.

Klein and Schwartz (6) used ketorolak, cefazoline, meperidine, hydroxyzine, ibuprofen, promethazine, oxycodone, and acetaminophen orally (intravenously for severe pain). Droperidol or ondansetron were the antiemetic drugs.

Al-Fozan et al (5) used acetaminophen with codeine; meperidine or fentanyl was used if additional pain control was necessary.

For assessing response to treatment, a pain-relief scale must be used. Pain cannot be said to have been relieved unless it has been directly measured. We used numeric pain score scales rated from 0 to 10 to assess pain before and after the procedure.

To reduce the postembolization pain, patients receive an anti-inflammatory before embolization to decrease the inflammation that may be present in the fibroid and the postembolization symptoms. In addition, the anti-inflammatory drugs have some analgesic action. For that purpose, the patients take an anti-inflammatory on the day before UAE (at breakfast and dinner) and on the day of UAE (at breakfast). We used 1,000-mg naproxen (Naprosyn) by mouth and started it on the day before because it has a half-life of 12–15 hours so that when patients start UAE they are already under the anti-inflammatory action, which helps decrease the inflammation present in almost every fibroid. We also use the acid-suppressing medication on the day before UAE to decrease the effects of the anti-inflammatory on gastric mucosa and the vomiting that may be associated with the anti-inflammatory when administered by mouth or intravenously.

Another important drug is ketorolak tromethamine, which, as suggested by Siskin et al (4), has potent analgesic and moderate anti-inflammatory activity and may potentiate the action of the tramadol given previously. Due to the administration of anti-inflammatory drugs before embolization and ketorolak tromethamine just before embolization of each uterine artery, only two of our patients felt severe pain during embolization. Siskin et al (4) inject ketorolak after the embolization of each uterine artery, but we do it before embolization and continue it after embolization.

After discharge, the pain is controlled mainly with naproxen and with tramadol plus paracetamol and codeine plus paracetamol if necessary.

To reduce vomiting, the patients start an acid-suppressing drug (omeprazole) that is a proton pump inhibitor before embolization. Vomiting is due to embolization but also to the effect of analgesic and anti-inflammatory drugs in gastric mucosa even if they are injected intravenously. Thus, the protection of gastric mucosa may be a reason for the vomiting decrease. For further reduction of vomiting, omeprazole is intravenously administered with metoclopramide and droperidol before embolization and with ondansetron after finishing UAE. After discharge, vomiting is controlled with use of dimenhydrinate as suppositories.

For patients to be treated with UAE as outpatients, it is important that they receive information about the postembolization constitutional symptoms they could expect and the corresponding medication to control pain and vomiting. The patients receive the information about postembolization symptoms at first consultation, and the information is repeated at admission and before discharge. Apart from the oral explanation, the patients receive a written form with all the symptoms and the corresponding control medication.

The administration of acid-suppressing and anti-inflammatory drugs the day before and at breakfast on the day of embolization for pain, nausea, and

vomiting, the association of several drugs in low dose after embolization, and good information about postembolization symptoms and the corresponding medications are keys to performing UAE as an outpatient procedure.

Important situations considered risk factors and in which patients could benefit with an overnight stay in the hospital for monitoring are hemodynamic instability during or after UAE, very intense pain or vomiting persisting 4–6 hours after embolization, massive vaginal bleeding, allergic reactions to the contrast media or medication, no family support, no means of secure and safe transportation home, noncompliance with the medication, or no means of communication with the interventional radiologist after the procedure. Associated important diseases (psychiatric, heart diseases, or other debilitating conditions with increased risk) can be considered relative contraindications to UAE as an outpatient procedure. Long distances between the hospital and home, inguinal hematomas, or large fibroids (>10 cm) were not considered absolute contraindications to UAE as an outpatient procedure but should be managed on an individual basis. From January 2007 to March 2008, we treated 238 patients and only two (0.8%) were excluded due to severe persisting postembolization pain.

Six months after embolization, there was a clinical improvement in 80.0%–92.4% of patients and a mean decrease in uterus and dominant fibroid volumes of 33.7% and 39.3%, respectively, proving that UAE as an outpatient procedure can be performed without risking the medium-term results.

In conclusion, with use of prophylactic pre-embolization medication for pain and vomiting, UAE can be performed safely as an outpatient procedure with high patient satisfaction rate, without increasing risks regarding the postembolization symptoms and without risking the medium-term results.

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