

Pharmacologic Pain Management in Outpatient Uterine Fibroid Embolization

Abstract

The key for successful uterine fibroid embolization in outpatient setting is good management of pain and other postembolization symptoms. Although several different protocols with different medication regimens have been used successfully in multiple institutions, it is still a challenge for interventional radiologists who should be prepared to provide detailed follow-up plans, continuous staff availability, and an oral medication regimen sufficient to alleviate these symptoms. Moreover, the interventional radiologist should be able to educate the patient about this postprocedural pain and available treatments.

Keywords: *Outpatient setting, pain, uterine fibroid embolization*

Introduction

Uterine fibroid embolization (UFE) is an effective treatment for symptomatic uterine fibroid and an alternative to traditional surgical therapies. It successfully controls symptoms in 85%–95% of patients for a median of 24 months.^[1-4] It was recognized and listed by the American College of Obstetricians and Gynecologists in the Level A treatment category in the management of uterine fibroids as a safe and effective treatment option based on long- and short-term outcomes.^[5]

UFE is accomplished with bilateral occlusion of the uterine artery, with the end point being stasis or near stasis in the artery and with no large uterine artery branches remaining patent. As the fibroid tissue is more vulnerable to embolization than the myometrium, UFE will result in irreversible ischemia and complete infarction of fibroids with gradual reversible ischemia of myometrium.^[6,7] These myometrial ischemic changes most likely cause significant pelvic pain with variable degrees of intensity within the first 24 h. Although such pain should not be considered a complication of UFE but an expected aspect of recovery,^[6] it continues to be a challenge for interventional radiologists to treat especially in outpatient setting of

UFE as it is the most common reason for readmission.^[8]

Pain after Uterine Fibroid Embolization

Post-UFE pain is both variable and unpredictable. It is most commonly described as menstrual-type cramps within the first 24 h after the procedure. Although there is little or no pain during the procedure, the pain starts when embolization is completed. It peaks at 7 h after the procedure and it starts to improve gradually over time.^[9] Its intensity is variable and ranges from mild cramps to cramps comparable with childbirth.^[10] Interpatient variations occur,^[11] and pain degree and experience are unpredictable in general as they are unrelated to the patient age, fibroid size and location, uterine size, and has no significant association with the size of embolic material used.^[9,12] However, the use of a large volume of embolic agents is associated with severe post-UFE pain,^[13] while limited or incomplete embolization with polyvinyl alcohol particles or gelatin-coated tris-acryl polymer microspheres may produce significant effective infarction of fibroids with less severe pain.^[14]

Racial difference in pain perception levels has been noted as a sole predictive factor prior to UFE as Black women recorded greater pain than White women.^[9,15] However, White women who had a greater

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mean volume of dominant fibroid in the reported studies are more likely to have severe nausea and emesis associated with pain than Black women.

Pain and other postembolization symptom management is the clinical challenge to perform UFE as an outpatient procedure.^[16] It is the responsibility of the interventional radiologist to manage the symptoms experienced by these patients immediately after embolization.

McGill University Health Center Protocol

At our institution, McGill University Health Center, we use a simplified protocol for pain management after UFE [Table 1]. The protocol was designed and assessed in close cooperation with the departments of anesthesiology and gynecology. It includes acetaminophen, codeine, and nonsteroidal anti-inflammatory drugs naproxen in addition to meperidine and fentanyl, when necessary. Based on a previous study by Pisco *et al*^[17], we started medications the night before and the day of the procedure to reduce the severity of postembolization symptoms, especially in regards to pain. After the procedure, the patient is transferred to the recovery room and aggressive treatment of pain is started until achieving the desired level of pain control. Pain is assessed on a regular basis to enable the administration of analgesics before progression to a level

where pain control is virtually impossible. Switching to oral medication starts usually after 4 h. We believe that oral medication if works in hospital, will work at home. The patient will be discharged home after 6–8 h and given appropriate instructions. In general, patients are recommended to take 1 week off from work. All patients are given appropriate contact numbers for the interventional radiology service, should any problems arise, and informed to return to the emergency department in case of severe pelvic pain which is unresponsive to the treatment. Patient follow-up consists of initial telephone contact during the first few days after UFE and a clinic visit at a 3- to 4-month interval. A magnetic resonance imaging scan is obtained at the 3-month follow-up visit. Nearly 81% of patients are discharged on the day of procedure and 19% of patients are admitted for pain control and/or fever control.^[16]

Reported Protocols

Although a fixed pain medication protocol cannot be recommended,^[15] several different protocols with different medication regimens have been published in the literatures.^[18-22] They have been used attempting to control the pain and manage the nausea and vomiting associated with UFE in outpatient setting. No consensus regarding the best pain management method after UFE has been achieved,^[23] and most of the protocols use a combination of opioid analgesics and nonsteroidal anti-inflammatory drugs to control post-UFE pain in addition to antiemetics for the associated nausea.

In addition, the use of superior hypogastric nerve block may significantly reduce pain and the need for narcotics.^[24]

The reported medication protocols in outpatient UFE are summarized in Table 2.

Patient Education

Most UFE patients are otherwise well and are able to communicate their experience and needs regarding pain and other symptoms. To achieve such needs, it is important to inform the patients during the initial consultation and on the morning of the procedure about the expected symptoms during the post-UFE recovery period and the medication regimen that will be used to manage these symptoms, especially the pain and vomiting. Moreover, the patient must receive a written form about all these symptoms with clear instructions regarding the adjustment in their medications, especially those prescribed for pain.

In summary, post-UFE pain in outpatient setting poses unique challenges to the interventional radiologists, who must be fully knowledgeable of the available methods and medications to provide safe and reliable pain relief, tailored for each individual patient. Both the education of patients regarding expected symptoms and the interventionalists' experience with a spectrum of medications in each

Table 1: McGill University Health Center protocol for outpatient uterine fibroid embolization

| Timing | Medications |
|--|--|
| Day before and morning of UFE | Anti-inflammatory drug: naproxen 500 mg PO Stool softener/light laxative Colace® 100 mg PO |
| Day of UFE – at angiography suite | Anxiolytic: Midazolam 1-2 mg IV |
| Before procedure | Analgesic: Fentanyl 50-100 µg IV |
| During the procedure: As soon as the embolization is completed | Analgesic: Fentanyl 50-100 µg IV then 25-50 µg IV until the desired effect is achieved |
| Day of UFE – at surgical recovery room | Analgesic Fentanyl 25-50 µg IV for a maximum dose of 250 µg |
| Pain control is by an experienced operating room nurse | or |
| Start fair aggressively for initial pain | Meperidine 10-25 mg IV with 5 min interval and a maximum dose of 50 mg then 50-100 mg IM every 3 h |
| Switch gradually to oral medication after 4 h as same as that will be used at home | Antiemetic: Ondansetron 2 mg IV Analgesic: Acetaminophen 325 mg and Codeine phosphate 30 mg PO |
| Discharge after 6-8 h | Anti-inflammatory drug: naproxen 500 mg PO Stool softener/light laxative Colace® 100 mg |

Table 2: Reported medication protocols for UFE in outpatient settings

| Study, year | Medications | Remarks |
|---|--|--|
| Sisken <i>et al.</i> , 2000 ^[22] | <p>Before UFE</p> <p>Cefazolin 1 g IV</p> <p>Prochlorperazine 25 mg PRN</p> <p>During UFE</p> <p>Midazolam 1 mg IV; repeated in 0.5 mg increments at 5-20 min intervals</p> <p>Fentanyl 0.50 µg IV; repeated in 0.50 µg increments at 5-20 min intervals</p> <p>Ketorolac 60 mg IV (administered in two doses of 30 mg; one dose after each uterine artery is embolized)</p> <p>After UFE</p> <p>Meperidine 75 mg IV with Vistaril</p> <p>25 mg IV (may be repeated once if necessary for continued pain)</p> <p>Ketorolac 30 mg IV PRN continued pain after meperidine</p> <p>Lortab 15 mg po PRN continued pain after meperidine and ketorolac</p> <p>At discharge</p> <p>Prochlorperazine 25 mg PRN q12 h PRN nausea for 3 days (days 1-3)</p> <p>Levofloxacin 250 mg po qd for 5 days (days 1-5)</p> <p>Meperidine 100 mg po q6h PRN pain for 24 h (day 1)</p> <p>Lortab 15 mg po q6h PRN pain for 4 days (days 2-5)</p> <p>Hydrocodone replaces meperidine after day 1</p> <p>Ketorolac 10 mg po q6h PRN pain for 3 days (days 1-3)</p> <p>Ibuprofen 400 mg po q6h PRN pain for 4 days (days 4-7)</p> <p>Ibuprofen replaces ketorolac after day 3</p> | 98% discharged within 8 h |
| Klein and Schwartz, 2001 ^[20] | <p>Promethazine suppository</p> <p>Cefazolin – single dose</p> <p>Ketorolac tromethamine – 60 mg IV preembolization</p> <p>Ibuprofen - TTO</p> <p>Oxycodone - TTO</p> | 83% of patients were discharged after an average of 6.9 h |
| Pron <i>et al.</i> , 2003 | <p>Before UFE</p> <p>Ketorolac tromethamine 30 mg PO or</p> <p>Ibuprofen 30 mg IM</p> <p>Indomethacin 50 mg suppository</p> <p>After UFE</p> <p>PCA morphine sulfate 40 mg set 1-1.5 mg bolus with 5-min lockout periods</p> <p>Ibuprofen 800 mg PO then 400 mg q4 h</p> <p>Nausea/vomiting: Metoclopramide, dimenhydrinate, or ondansetron</p> <p>At discharge</p> <p>Ibuprofen</p> <p>Codeine noroxycodone with acetaminophen (one or two tablets every 4-6 h as necessary)</p> <p>Stool softeners</p> | |
| Rasuli <i>et al.</i> , 2004 ^[24] | <p>Regimen split into regimen A and regimen B; after being reviewed by the pain management practice. Regimen B pointed out a possible better solution for managing pain and nausea</p> <p>Regimen A</p> <p>Before and during UFE</p> <p>Indomethacin</p> <p>Lorazepam 2 mg sublingually 15 min before</p> <p>Fentanyl 50 g IV as needed at 30-min intervals during</p> <p>After UFE</p> <p>Fentanyl 25 g IV as needed at 10-min intervals</p> <p>Metoclopramide 10 mg IV</p> <p>Dexamethasone IV 8 mg</p> | <p>Superior hypogastric nerve block was used</p> <p>All patients discharged within 6 h</p> |

Contd...

Table 2: Contd...

| Study, year | Medications | Remarks |
|---|--|---|
| | At discharge Morphine 10 mg orally every 4 h as needed for 7 days Metoclopramide 10 mg orally daily as needed for nausea Indomethacin 100 mg rectal suppository every 12 h Ciprofloxacin 500 mg orally daily Note – IV intravenous | |
| | Regimen B Before and during UFE Naprosyn 500 mg rectal suppository before UFE Morphine 5-10 mg IV during UFE Midazolam 1-2 mg IV during UFE Cefazolin 1 g IV before UFE | |
| | After UFE Long-acting morphine 30 mg orally Morphine 2 mg IV PRN at hourly intervals Dimenhydrinate 50 mg IV Dexamethasone 8 mg IV Prochlorperazine 10 mg rectal suppository PRN for nausea | |
| | At discharge Long-acting morphine 30 mg PRN 12 h for 7 days Morphine 10 mg orally q4 h as needed for 4 days Dimenhydrinate 50 mg rectal suppository daily for 7 days Naprosyn 500 mg rectal suppository daily for 7 days Ciprofloxacin 500 mg orally daily for 7 days | |
| Baerlocher <i>et al.</i> , 2006 ^[19] | Before UFE IV two-thirds 5% dextrose, one-third 0.9% normal saline at 150 cc/h Cefazolin 1 g IV or vancomycin 500 mg Metoclopramide 10 mg IV Ketorolac 30 mg IV Ondansetron 16 mg orally | Morphine was used through a controlled analgesic pump Most of patients discharged 6-10 h after UFE |
| | After UFE IV two-thirds 5% dextrose, one-third 0.9% normal saline at 150 cc/h Morphine 2-4 mg IV every 5 min as needed Gravol 25-50 mg IV every 4 h as needed Oxycodone 10 mg orally 4 h postprocedure | |
| Pisco <i>et al.</i> , 2009 ^[21] | Day before UFE Omeprazole 20 mg by mouth Naproxen 1000 mg by mouth Hydroxyzine 25 mg by mouth Stool softener suppositories | |
| | Day of UFE Diazepam 5 mg sublingually Omeprazole 20 mg IV Metamizole 2 g IV Tramadol 100 mg IV Metoclopramide 25 mg IV Droperidol 0.10 mg IV Piroxicam 20 mg IV Cefazolin 1 g IV | |
| | During UFE Ketorolac 30 mg IV × 2 Midazolam 1 mg IV if needed | |
| | After UFE | |

Contd...

Table 2: Contd...

| Study, year | Medications | Remarks |
|---|---|---------|
| Rasuli <i>et al.</i> , 2013 ^[25] | Omeprazole 20 mg IV | |
| | Paracetamol 1g IV | |
| | Metamizole 2 g IV | |
| | Ketorolac 30 mg IV | |
| | Piroxicam 20 mg IV | |
| | Metoclopramide 25 mg IV | |
| | Ondansetron 2 mg IV | |
| | At discharge | |
| | Tramadol 100 mg IV | |
| | Metoclopramide 25 mg IV | |
| | Before UFE | |
| | Diclofenac 100 mg rectal suppository before UAE | |
| | Morphine 2-5 mg IV | |
| | Midazolam 1-2 mg IV | |
| | Cefazolin 1 g IV | |
| After UFE | | |
| Long-acting morphine 30 mg orally | | |
| Morphine 2 mg IV as needed at hourly intervals | | |
| Demerol 25-75 mg IV as needed | | |
| Dexamethasone 8 mg IV | | |
| Dimenhydrinate 50 mg IV | | |
| Metoclopramide 10-20 mg IV as needed for nausea | | |
| Prochlorperazine 10 mg rectal suppository | | |
| At discharge | | |
| Long-acting morphine 30 mg orally as needed every 12 h for 7 days | | |
| Morphine 10 mg orally every 4 h as needed for 4 days | | |
| Metoclopramide 10 mg as needed orally every 8 h for 7 days | | |
| Diclofenac 100 mg rectal suppository daily for 7 days | | |
| Ciprofloxacin 500 mg orally daily for 7 days | | |
| Spencer <i>et al.</i> , 2013 ^[26] | Before and during UAE | |
| | Toradol 10 mg IM/IV 1 h before | |
| | Zofran 4 mg IV 30 min before | |
| | Dilaudid 0.5 mg IV 30 min before | |
| | PCA is started 0.2 mg q10 min without bolus | |
| | After UFE | |
| | Toradol 10 mg IV q6 h until AM | |
| | Zofran 4 mg IV/PO q4 h PRN | |
| | Dilaudid PCA 0.2 mg q10 min without bolus | |
| | Colace® 100 mg PO daily | |
| | At discharge | |
| | Percocet 5/325 mg 1-2 tab q4-6 h PRN or | |
| | Vicodin 5/500 mg 1-2 tab q6 h PRN | |
| | Naprosyn 500 mg PO BID 7 d then PRN | |
| | Colace 100 mg daily | |
| Miralax 17 g daily | | |

PCA: Patient-controlled analgesia

category prove helpful in optimizing each patient's care and achieving individual satisfactions.

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Conflicts of interest

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