Evaluation of Pain After Uterine Artery Embolization

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OBJECTIVE: In this study our aim was to determine the severity of post procedure pain associated with uterine artery embolization (UAE).
STUDY DESIGN: Twenty-one women with symptomatic uterine fibroid were recruited for the study. The procedure was performed in the angiography unit under conscious sedation. All patients received prophylactic intravenous antibiotics and analgesic, ibuprofen 600 mg. At the completion of the procedure, all patients were given ibuprofen 600 mg orally every six hours. The patients were discharged with oral ibuprofen (600 mg 4 times daily). The main outcome measure was severity of pain. The instrument for evaluation of pain was visual analog scale. The measurements were taken at every hour.
RESULTS: Twenty-one procedures were performed. The mean age was 43.04±4.21 years (range 34-52) and median parity was 4 (0-6). The mean post procedure pain scores after 1, 2 and 3 hours were 3.33±2.00, 4.57±1.74, 4.95±1.71 respectively. After the completion of embolization, it was found that pain appeared to peak in the initial 3-4 post-embolization hours, reached a plateau and then declined by 9 hours.
CONCLUSION: There is an increased need for post procedural pain control for UAE patients, especially in the first 6 hours after the procedure.
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Key Words: Pain, Uterine artery embolization, Myoma uteri

The leiomyoma is the most common benign tumor of the uterus and found clinically in 20% to 30% of women.[1]

Hysterectomy or myomectomy has been the traditional treatment of uterine fibroids (leiomyomas).[2] Uterine artery embolization (UAE) has within a few years become one of the most popular minimally invasive therapeutic alternatives to hysterectomy for patients with symptomatic fibroids. Many patients were spared surgery after UAE when their myomata shrank.[3,4] Because treatment of post-embolization pain continues to be an ongoing concern, we have performed a prospective observational study that attempts to determine severity of post procedural pain in patients undergoing UAE.

Material and Methods

Twenty-one women with symptomatic uterine fibroid were recruited from Yüzüncü Yıl University Research hospital in Van for this study. The local institutional review board approved the research. Indications for UAE included heavy menstrual bleeding, pelvic pain or pressure caused by fibroids. Exclusion criteria included contraindications to angiography and embolization, such as coagulopathy, pregnancy, pelvic inflammatory disease, diabetes mellitus, severe renal insufficiency, arteriovenous malformations, vasculitis and patients requiring pelvic surgery for concomitant conditions. These patients would have otherwise been candidates for surgical resection. All patients underwent pelvic ultrasonography and MRI to measure the diameter of the largest myoma, and the total uterine volume before UAE, most with the same observer and equipment. Patients desiring future fertility were counseled about potential risk of UAE, including hysterectomy, radiation exposure and premature menopause. Alternative treatments were discussed. All women were seen in the research clinic at three and six month's post-procedure and had an ultrasonografic scan each visit. Six months later the women were reevaluated with MRI.

The Procedure

All women had a gynecological exam (performed by gynecologist) before UAE. The procedure, risks, indications, and alternatives were explained to the patient in detail by the interventional radiologist, after which informed consent was obtained both for the procedure and clinical trial. Pre-procedural blood work included complete blood count, prothrombin time, partial thromboplastin time, and serum creatinine.

The procedure was performed in the angiography unit under conscious sedation, which was achieved with 50 mg pethidine (Aldolan, Liba, İstanbul, Turkey). All patients received prophylactic intravenous antibiotics, and oral analgesic (ibuprofen 600 mg). Vascular access was obtained from a right common femoral arterial approach, and selective catheterization of uterine arteries was carried out with four or five French Cobra catheters, sometimes with fo-

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ur French Simons 2 catheters. The primary embolic agent used was polyvinyl alcohol particles (PVA) sized 355-500 μm (contour; Tru-Fil; Cordis, Miami, FL). Embolization of uterine arteries proceeded until complete vascular occlusion was achieved. After the arteries were embolized a final arteriogram was obtained and generally there was residual flow to normal myometrial branches.

Patients were kept in bed resting for 12 hours after the procedure and then evaluated for possible discharge. At the completion of the procedure, all patients were given ibuprofen 600 mg (Artril, Eczacıbaşı, İstanbul, Turkey) orally every six hours for a day. The patients were discharged on oral ibuprofen (600 mg 4 times daily) on demand. Pain scores were recorded along with the ibuprofen data, with patients asked to grade their pain on scale of 1 to 10. The main outcome measure was severity of pain. The instrument for evaluation of pain was visual analog scale. The measurements were taken at every hour.

Results

Twenty-one procedures were performed and Table 1 shows patient characteristics. The mean age was 43.04±4.21 years (range 34-52) and median parity was 4 (0-6) with a mean follow-up of 6 months. Within the group, one woman had a previous myomectomy history. The patients underwent embolization for uterine myomas that had dimensions ranging between 5.23 and 734.29 ml with a median 54 ml. In all patients we were able to selectively embolize the branch of uterine artery supplying the myoma. The length of procedure was 72.6±19.9 minutes.

Table 1. Baseline Patient Data

Variables	
Mean age (years)	43.04±4.21
Median parity	4 (0-6)
Earlier therapy (n, %)	1 (4.7)
Myoma localization (n, %)	
Intramural	19 (90.4)
Submucous	1 (4.8)
Cervical	1 (4.8)
Mean uterine volume (cm3)	54 (5.23-734.29)
Symptomatology (n, %)	
Bleeding	18 (85.7)
Bleeding and symptoms of pelvic pressure	2 (9.5)
Symptoms of pelvic pressure	1 (4.8)
Length of procedure (min)	72.6±19.9

Imaging follow-up was obtained in all patients at 3 and 6 months after treatment. After embolization, the volume of myomas was reduced significantly: 54 (5.23-734.29) vs. 9.41 (0.06-197.69) ml. The mean reduction in fibroid volume (measured on MRI at 6 months post-embolization) was 77.13% (range 30.52-99.82).

Pain scores were recorded, with patients asked to grade their pain on scale of 1 to 10. The mean post procedure pain scores after 1, 2 and 3 hours were 3.33±2.00, 4.57±1.74, 4.95±1.71 respectively. After the completion of embolization, it was found that pain appeared to peak in the initial 3-4 post-embolization hours, reached a plateau and then declined by 9 hours.

Discussion

UAE, a less invasive alternative, seems to be highly effective in the treatment of fibroids. Embolization of the uterine arteries is known to diminish the size of the leiomyomas, and has high patient satisfaction. Worthington-Kirsch et al reported the results of this therapy in 53 patients. Follow-up at 3 months indicated improvement of menstrual bleeding patterns in 88%. For the patients with bulk-related symptoms, 94% experienced marked improvement. The mean reduction in fibroid volume was 46%. Complications included extensive infarction in one patient requiring hysterectomy.[5]

Even though UAE is claimed to be a safe and suitable procedure for high-risk patients, it is not without risks of complications. But has a low complication rate. It is also an excellent alternative for patients with religious prohibitions against blood transfusions and those who are severely anemic and need immediate intervention.[6]

Treatment of post-embolization pain continues to be an ongoing concern. Acute devascularization and infarction of fibroids occurs immediately after UAE and requires aggressive pain management for most patients. The most appropriate method for the treatment of post-embolization pain in uterine fibroids remains uncertain. Although some authors suggest the administration of conscious sedation with or without oral analgesics, others have reported the need for general anesthesia. The other options currently used include the use of periodic injections of parenteral narcotics either intramuscularly or intravenously,[7] continuous epidural anesthesia[8] and a patient-controlled analgesia morphine pump and administration of regular doses of ketorolac.[9] Keyoung JA and et al evaluated the effectiveness of intraarterial lidocain in controlling pain after uterine artery embolization. Patients in the lidocain group had lower numeric rating scale pain score than those in the placebo group, whereas there was no difference in morphine requirement between treated patients and control subjects. Intraarterial %1 lidocaine is associated with moderate to severe vasospasm. Lidocaine significantly lowers subjective pain, but there is no difference in analgesic requirements. The routine use of intraarterial lidocaine is not recommended for pain control until the long-term effects of vasospasm on outcome is known.[10]

In this study we have assessed time course of pain after UAE to determine the need for analgesics. We chose the visual analog scale as the main end point because it evaluates pain directly. Our article demonstrates the typical course of

pain after UAE. We found crampy pain to be increased for approximately 3 hours, thought to be due to an initial post-embolization period of global uterine ischemia caused by the sudden occlusion of the main uterine arteries. The pain then had a plateau for 4-7 hours, and then declined at the 9th hour with resumption of blood flow to the normal myometrium. The residual pain is probably due to ischemia of the fibroids themselves. Need for pain control after UAE was noted to be in the first 5-8 hours in Worthington-Kirsch's study.[11]

Advantages of UAE include less hospital stay, with the objective that the patients should experience less pain. Our study also suggests that oral analgesics are sufficient in terms of pain control and patients' satisfaction after UAE. The analgesic drug used was ibuprofen 600 mg in liquid-filled capsules. Patients were given 4 doses of ibuprofen at our initiative, at 6-hour intervals. The first dose was administered 6 hours after surgery. We also used conscious sedation. Conscious sedation with oral analgesics was effective to reduce discomfort. Furthermore this technique can be performed in an outpatient setting with good compliance for patients and a reduced discharge time, without the need for general anesthesia. The use of a PCA machine has been shown to be effective but expensive and require special equipment. Continuous epidural anesthesia requires an indwelling epidural catheter, with the increased possibility of infection and the need for trained anesthesia personnel. We believe that, using this approach; a high percentage of patients with fibroids could be effectively managed as outpatients.

As a conclusion, increased post procedural pain especially in the first 6 hours found in this study will help the pain management team in the post procedural setting.

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