

:  
 : 2004 4 2004 7 4 15  
 Visual Analogue Scale (VAS) 3  
 8  
 가 2 가 2  
 12 (26 - 46 , : 36.3 )  
 2.8 Fr 500 - 710  $\mu$ m  
 polyvinyl alcohol ( PVA )  
 1) (nonsteroidal  
 antiin - flammatory drug, NSAIDs ) ketorolac trometha - mine (Tarasyn,  
 ) 30 mg 2)  
 (opioids) meperidine (Demerol, ) 150 mg 500 ml  
 12 15 gutt  
 3) ketorolac tromethamine 30 mg 6 가  
 가 가 NSAIDs diclofenac  
 sodium (Valentac, ) 75 mg 12 VAS  
 12 VAS 가 4  
 가 VAS ,  
 : VAS / 가 /  
 가 1.4/1/0 가 0.5/0.5/0  
 가  
 1

1

가 (1 - 5).

가 가 가  
(NSAIDs) 가 (opioids)

2.8 Fr (coaxial microcatheter) (Progreat, Terumo, Tokyo, Japan)  
500 - 710  $\mu$ m polyvinyl alcohol (PVA) (Contour, Boston Scientific Corp., Natick, MA, U.S.A.) (Fig. 1).

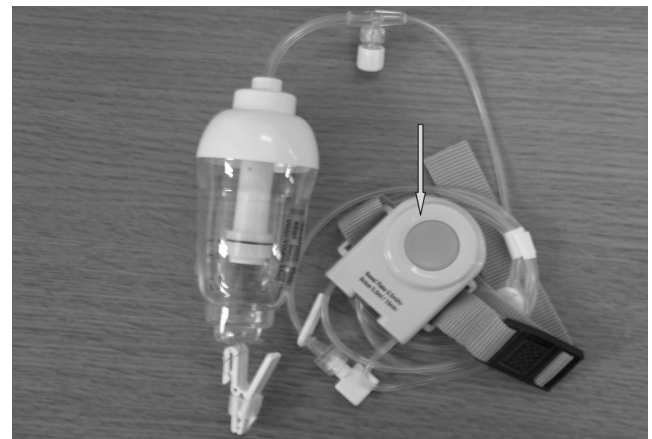
가  
(Fig. 2).

ketorolac tromethamine 30 mg  
meperidine  
2004 4 2004 7 4  
15  
Visual Analogue Scale(VAS) 3  
8 가  
가  
2 12 (26 - 46  
, : 36.3 )  
5F

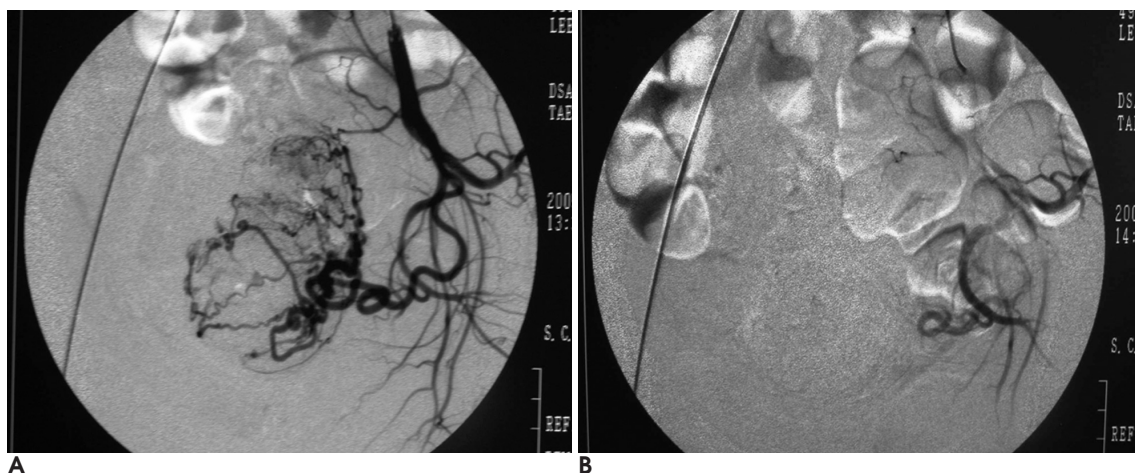
**Table 1.** Our Protocol of Intravenous Analgesia for Pain Management

| Time                            | Analgesics   |
|---------------------------------|--|
| Prior to procedure at angioroom | IV ketorolac 30 mg   |
| After one side UAE              | IV mepheridine 150 mg  |
| After 6 hr of 1st IV ketorolac  | IV ketorolac 30 mg   |
| If pain complaint               | IM valentac 75 mg  |
| After 12 hour, And check VAS    | If VAS < 4,<br>change into PO medication<br>If VAS $\geq$ 4, change into IV PCA<br>or IV ketorolac |

UAE = Uterine Artery Embolization, IV = Intravenous, IM = Intramuscular. VAS = Visual analogue scale, PO = Per oral, PCA = Patient controlled analgesia



**Fig. 2.** Patient controlled analgesia (PCA) device. When the patient feels intolerable pain, the patient press the patient controlled button (arrow). And then analgesics is injected via intravenous root.



**Fig. 1. A, B.** 37-year-old woman with uterine myoma. Internal iliac angiogram shows tortuous enlargement of uterine artery and hypervascularity of uterine artery. Uterine artery is occluded by PVA particle. Normal saline mixed meperidine is injected after unilateral embolization was finished.

12 VAS ruler (Astra-  
geneca, Australia) (Fig. 3) VAS

. 12 VAS 가 4

ketorolac tromethamine      가  
가 .

VAS ,

355 - 710  $\mu\text{m}$  PVA  
500 - 710  $\mu\text{m}$  PVA

VAS /  
가 / 가 1.4/1.0  
가 0.5/0.5/0 .

(6, 7).

가 .

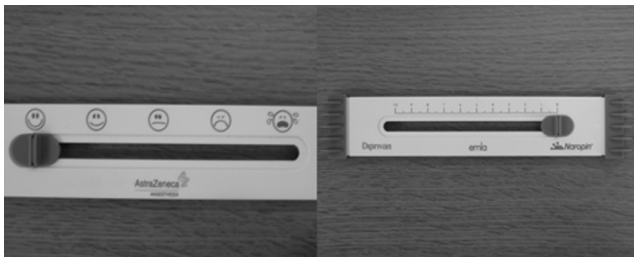
1

(global

uterine ischemia)

(Table 2).

12



**Fig. 3.** Visual analogue scale (VAS) ruler.

The VAS consisted of a 10 cm line with the left end marked “ no pain ” and the right end marked “ worst imaginable pain ”. the patient place a line at the location that corresponded to the level of pain. The score is the distance in centimeters from left end of the line to the patient ’ s mark on the line.

(hyaline degeneration) (8, 9).

|            |      |      |
|------------|------|------|
| (10 - 14). | Pron | (15) |
| 30%        |      | 92%  |

가 (16 - 20).

(Opioids)

(NSAIDs)

ropivacaine

lidocaine,

**Table 2.** VAS score, Booster Injection and Complication in 12 Patients

| Patients                | VAS score | Booster injection | Complication |
|-------------------------|-----------|-------------------|--------------|
| Modified IV analgesia 1 | 2.5       | 2                 |              |
| Modified IV analgesia 2 | 2.5       | 1                 | Mild dyspnea |
| Modified IV analgesia 3 | 2.5       | 1                 |              |
| Modified IV analgesia 4 | 1         | 0                 |              |
| Modified IV analgesia 5 | 1         | 0                 |              |
| Modified IV analgesia 6 | 1         | 0                 |              |
| Modified IV analgesia 7 | 1         | 0                 |              |
| Modified IV analgesia 8 | 0         | 0                 |              |
| IV PCA 1                | 2         | 1                 |              |
| IV PCA 2                | 0         | 0                 |              |
| Epidural PCA 1          | 0         | 0                 | Back pain    |
| Epidural PCA 2          | 0         | 0                 | Back pain    |

VAS= Visual analogue scale, IV= Intravenous, PCA= Patient controlled analgesia

:

(nerve block) . Andrew (17)

1% lidocaine

naproxen, fenoprofen, ibuprofen, ketorolac

(spasm)

가

. Rasuli  
(superior

retension)

(urinray

(18)  
hypogastric nerve block)

가

meperidine

가

가

ketorolac tromethamine

meperidine

가

12

가

(1000 mg)

가

가

ketorolac

(storage) (intravenous route),

tromethamine

(continuous infusion)

가 가

가 (bolus dose)

60 mg

가

ketorolac tromethamine

(lock out time)

가

가 가

가

가

가

가

. 가

meperidine, morphine, fentanyl,

가

가

codeine

. fentanyl 가

meperidine

ketorolac tromethamine

가

lidocaine,

ropivacaine

가

가

Saito (19)

0.2 % ropivacaine

(epidural

가

route) (continuous infusion)

12

PVA

9

가

가 500 - 710  $\mu$ m

가

ropivacaine

355 - 500  $\mu$ m

Siskin (20)

가

가

ketorolac tromethamine ,

가

355 - 500  $\mu$ m

30 mg

opioids

meperidine ketorolac tromethamine

PVA

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## Usefulness of Modified Intravenous Analgesia: Initial Experience in Uterine Artery Embolization for Leiomyomata<sup>1</sup>

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**Purpose:** We wanted to evaluate the usefulness of modified intravenous analgesia for the management of pain during uterine artery embolization for leiomyomata.

**Materials and Methods:** Between April 2004 and July 2004, 15 patients with symptomatic fibroids underwent uterine artery embolization and pain management. Except the three patients for whom the Visual Analogue Scale (VAS) score was not obtained, twelve patients were included in this study. For pain management, epidural PCA (Patient Controlled Analgesia) was used in two patients, intravenous PCA was used in two patients and modified intravenous analgesia injection was used in eight patients. For all the patients, we used the 2.8 Fr coaxial microcatheter and 500 - 710  $\mu$ m PVA particles for the embolic materials. The protocol of the modified intravenous analgesia injection was as follow, 1) prior to femoral artery puncture, 30 mg of ketorolac tromethamine (Tarasyn) was injected via an intravenous route. 2) At the time that the one side uterine artery embolization was finished, normal saline mixed 150 mg meperidine (Demerol) was administered through the side port of the intravenous line that was used for hydration. 3) Additional ketorolac tromethamine 30 mg was injected after 6 hour. The VAS score and side effects were then checked. After 12 hours, the VAS score was rechecked. If the VAS score was above 4, this was considered as failure of pain management. The VAS scores, complications and side effects for the modified intravenous analgesia injection were compared with that of IV PCA and epidural PCA.

**Results:** The average VAS score of the modified intravenous analgesia injection, intravenous PCA and epidural PCA was 1.4, 1 and 0, respectively; the number of additional intramuscular injections of analgesia was 0.5, 0.5 and 0, respectively. All the patients who underwent epidural PCA had back pain at the puncture site and 1 patient who underwent modified intravenous analgesia injection experienced mild dyspnea, but they easily recovered with such conservative treatment as an oxygen supply. No serious side effects or complications developed from the modified intravenous analgesia injection.

**Conclusion:** Modified intravenous analgesia injection is well tolerated for the pain management of uterine fibroid embolization and it is a relatively inexpensive, safe method as used in our radiologic practice.

**Index words :** Drug

Drug side effect

Uterine neoplasms

Arteries, therapeutic embolization

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