

CT :

1

. . . . 2 . 2 . 2 . 2 . 2 . 3

: CT CT 가
: 2003 3 2005 8 15 (28 - 49 , : 36.4)
6 CT
CT MRI ,
6 CT 가 .
: CT 74.4 HU 80 HU CT 가
Group I, Group II . CT Group I 91.25 HU,
Group II 40.8 HU (p < 0.05).
Group I 73%, Group II 10% (p < 0.05).
: 6 CT 가
CT 가

가 (1-5).

6 CT CT

1-2 3-6 가 5
(6-8).

3-6 가 .

, , 2003 3 2005 8 30 , ,
3-6 가가 37 4 31
2 가 (intramural myoma) 6
CT 가
6 MRI
가 15 (28 - 49 ,
36.4)
Table 1 .

1
2
3

2008 6 5 2008 7 8

MRI 1.5T Magnetom Sonata(Siemens, Erlangen, Germany) T1 (TR/TE/TSE factor, 581 ms/13/3), T2 (TR/TE/TSE factor, 4910 ms/102 ms/17) 15 mL gadolinium(Omniscan, Nycomed Amersham, Oslo, Norway) T1 (TR/TE 569 ms/12 ms) (acquisition matrix) 223 × 260, 260 × 260 5 mm × 0.5 mm (length) × (width) × (depth) × 0.5233 (ellipsoid formula) micromonocin (Noborasyne), cephalothine(kefrin), Ornidazole(Tiberal)

5F Cobra (Cook, Bloomington, IN, U.S.A.) Yashiro (Terumo, Tokyo, Japan) 2.8 F (coaxial microcatheter) (Progreat, Terumo, Tokyo, Japan) (Fig. 1B) 355 - 710 μm polyvinyl alcohol(PVA Contour, Boston Scientific Corp.,

CT Natick, MA, U.S.A.) (end point) (cervicovaginal artery) 가 10 (Fig. 1C). (uterioovarian anastomosis) 가 (Tornado embolization microcoil, Cook, Bloomington, U.S.A.) CT CT 6 CT CT W2000 (Hitachi medical system, Tokyo, Japan) 10 mm, 10 mm CT 가 CT CT (region of interest, ROI) (Fig. 2A) CT CT 가

Table 1. Patient's Symptoms

Symptom	n (%)*
Menorrhagia	11 (73)
Anemia	3 (20)
Pelvic pain	7 (47)
Bulk related problems including urologic symptom	6 (40)

* percentages exceed 100% because some patients had more than one symptom

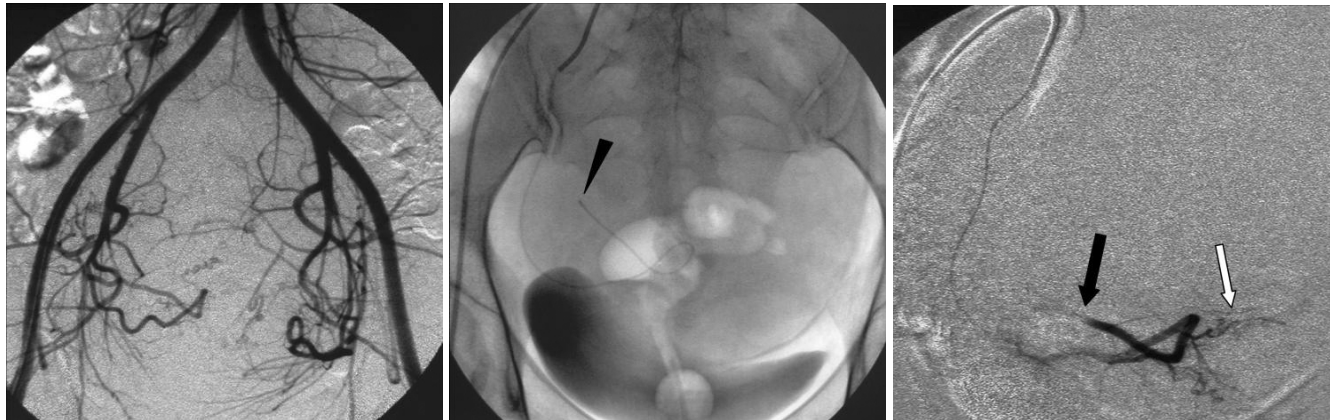
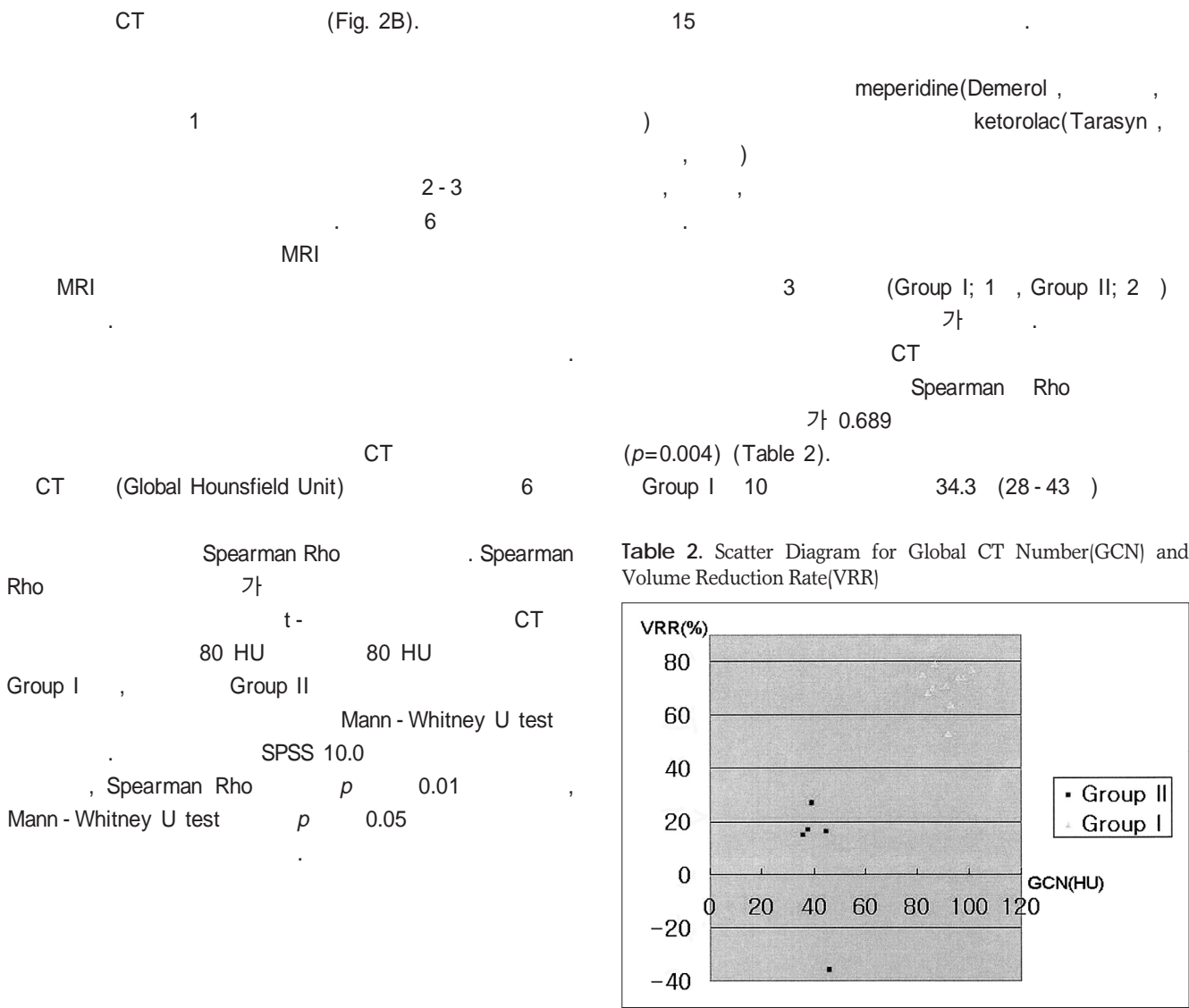


Fig. 1. End point of UFE.
A. Pelvic arteriogram shows hypertrophied both uterine artery with increased vascularity in uterus and myoma.
B. Tip(arrowhead) of microcatheter is advanced into the ascending segment of uterine artery.
C. Complete occlusion of ascending segment of uterine artery(black arrow) is noted but cervicovaginal artery is spared(white arrow).



CT 91.25 HU(82 - 101.6 HU), CT 132 HU(98.6 - 162 HU) 161.16 cm³(25.1 - 586.1 cm³), 44.08 cm³ (8.3 - 153 cm³) 73%(68 - 79%) . (Fig. 3, 4).

Group II 5 38.2 (30 - 45) CT 40.8 HU(36 - 46 HU), CT 129 HU(95 - 148 HU) 71.7 cm³(59.5 - 85.2 cm³), 65.1 cm³ (50.3 - 81.2 cm³) 10% (15~ - 36%) .

가 2 (Fig. 5), 가 3 (Fig. 6) .

Group II 40.8 HU (p < 0.05). 117.1 cm³, Group II 6.6 cm³ (p < 0.05), 73%, Group II 10% (p < 0.05). CT 129 HU, Group II 129 HU (p > 0.05) (Table 3).

40 20 - 50%

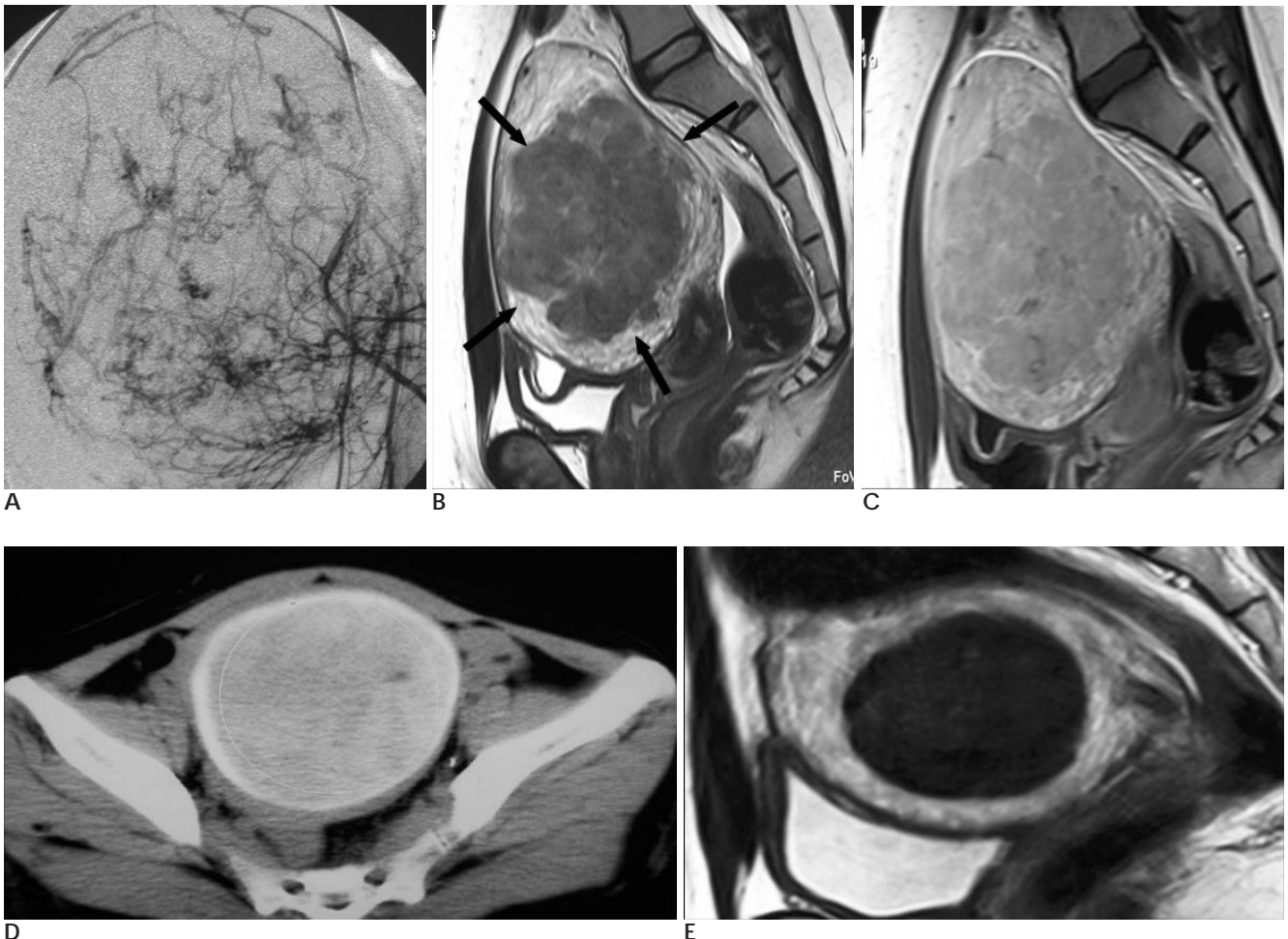


Fig. 3. Successful outcome after uterine fibroid embolization in 34-year-old woman.
A. Delayed arterial phase of internal iliac angiogram shows hypervascularity in myoma.
B. Sagittal T2-weighted MR image (TR/TE, 4910/102) shows enlarged uterus and large low-signal-intensity myoma (black arrow) (10 × 9.5 × 7.8 cm).
C. Gd enhanced sagittal T1-weighted MR image (TR/TE, 569/12) shows well enhancing myoma.
D. Non contrast enhanced pelvic CT shows globular contrast retention within the myoma(GHU:98.5) at six hours after UFE.
E. Six months after UFE, sagittal T2-weighted MR image shows markedly decreased volume of myoma (6.8 × 6.2 × 4.6 cm, VRR:74%).

가 (9, 10).

가

(GnRH - agonist: gonadotropin releasing hormone agonist) 가

6

(12, 13).

가 가

25%

가 (11).

가

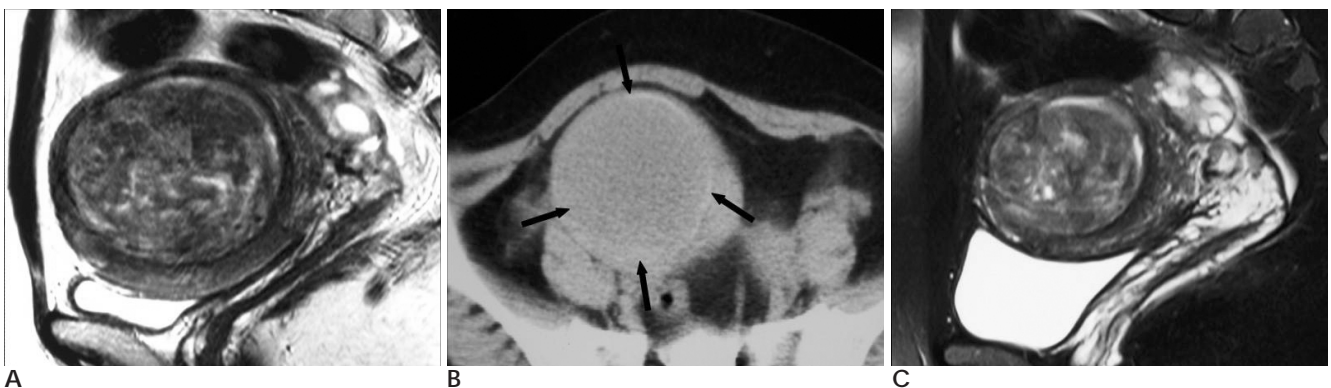
Table 3. Statistical Comparison of Predictive Factors Between Group I and II

	Group I	Group II	p value
Mean Global CT Number (HU)	91.3	40.8	< 0.05
Mean Maximal CT Number (HU)	132	129	> 0.05
Mean Volume Reduction (cm ³)	117.1	6.6	< 0.05
Volume Reduction Rate (%)	73	10	< 0.05

1970

1995 Ravina (14)

1%

**Fig. 4.** Successful outcome after uterine fibroid embolization in 28-year-old woman.**A.** Sagittal T2-weighted MR image shows enlarged uterus and large low-signal intensity myoma ($5.7 \times 4.4 \times 4.8$ cm).**B.** Non contrast enhanced pelvic CT shows globular contrast retention within the myoma (GHU:87.4) at six hours after UFE.**C.** Six months after UFE, Gd enhanced sagittal T1-weighted MR image shows markedly decreased volume of myoma without any enhancement ($3.5 \times 2.6 \times 2.9$ cm, VRR:79%).**Fig. 5.** Unsatisfactory outcome after UFE in 38-year-old woman.**A.** Sagittal T2-weighted MR image shows low-signal-intensity myoma in fundus and body of uterus ($5.6 \times 4.7 \times 5.0$ cm).**B.** Non contrast enhanced pelvic CT shows linear contrast retention at the outer margin of myoma (GHU:38) at six hours after UFE.**C.** Six months after UFE, sagittal T2-weighted image shows slightly decreased volume of myoma ($5.2 \times 4.3 \times 4.3$ cm, VRR:27%).

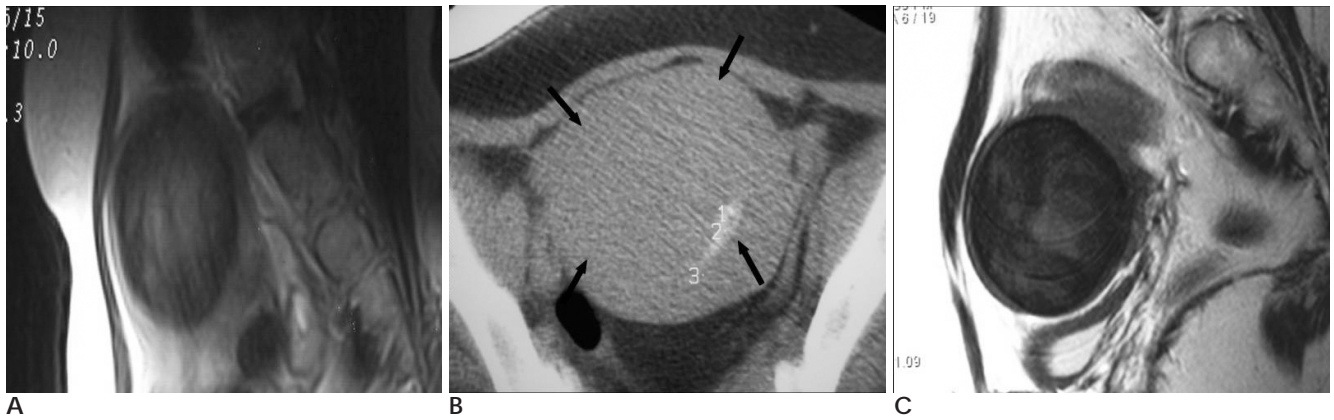


Fig. 6. Unsatisfactory outcome after UFE in 35-year-old woman.

A. Sagittal T2-weighted MR image shows low-signal-intensity myoma in fundus of uterus ($5.4 \times 5.8 \times 5.2$ cm).

B. Non contrast enhanced pelvic CT shows focal linear contrast retention at the outer margin of myoma (GHU:45) at six hours after UFE.

C. Six months after UFE, sagittal T2-weighted MR image shows slightly decreased volume of myoma ($5.3 \times 5.0 \times 5.2$ cm, VRR:16%).

(pressure symptom)

가
가
가
(1 - 5, 15). 가
가
(hyaline degeneration) 3 - 6
가
(22) 3
Fleischer
3 - 6
Lipman
(23)
(viable myoma)
MRI
(nonviable myoma)
(16, 17). 5
50%
(18). 3 - 6
50%
(viable cellular myoma) 가
(19) Spies
(24) 가
Fleischer
Weintraub
가
Ahmad (20) 가
Sterling (25)
CT
Vott (26) 1 24
(white) 6
(snake sign) 가
(21) 가
, Tranquart
3 12 가
(wash out)
18

MRI
 CT 가
 CT
 MRI
 가
 Vott (26) 6
 CT CT
 가 가
 6 CT CT
 가 80 HU 50%
 가 가
 CT
 가 가
 CT 가
 가
 가
 CT
 가
 6
 CT
 CT 가 80 HU
 50% CT 가

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Hounsfield Number Measurement after a Uterine Fibroid Embolization: Significance as a Predictive Factor of Embolization Success¹

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Purpose: To assess the usefulness of the Hounsfield number, measured by a non-contrast enhanced pelvic CT, after a uterine artery embolization as an index of the successful outcome of a uterine fibroid embolization (UFE).

Materials and Methods: The study subjects included 15 women (age range: 28 - 49 years, mean age: 36.4 years) diagnosed with symptomatic uterine myomas and seen from March 2003 to August 2005. A non-contrast enhanced pelvic CT scan was performed six hours after a uterine artery embolization. The global and maximal CT numbers were measured for each myoma. In addition, a pelvic MRI was performed to measure the volume of each myoma prior to and 6 months after the UFE. The relationship between fibroid volume reduction and the global CT number were prospectively analysed.

Results: The mean global CT number was 91.25 HU in Group I and 40.8 HU in Group II. Further, the mean fibroid volume reduction rate was 73% in Group I and 10% in Group II ($p < 0.05$).

Conclusion: The global CT number measured by a non-contrast enhanced pelvic CT is a useful predictive factor of a successful uterine fibroid embolization.

Index words : Uterine neoplasms
Leiomyoma
Radiology, interventional
Embolization, therapeutic
Tomography, X-Ray computed