

## Uterine Arterial Embolization for the Treatment of Leiomyomas Accompanying with Adenomyosis

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**Objective:** The purpose of this study was to make a guideline of uterine artery embolization for the treatment of uterine leiomyomas accompanying with adenomyosis in Korea.

**Materials and Methods:** We performed the retrospective study for 37 women who had uterine leiomyomas accompanying with adenomyosis. Bilateral uterine artery embolization was performed in 37 patients (age range 25-65) during 17 months with pain, hypermenorrhea, urinary frequency etc due to leiomyomas. Ultrasound imaging was performed before the procedure and at mean 6.9 months after the procedure.

**Results:** All procedures were technically successful. Mean clinical follow-up was 12.8 months. Minor complication occurred in 82% patients after the procedure. After imaging follow-up (mean, 6.9 months postprocedure), median uterine volume decreased 34.4%, and dominant myoma volume decreased 86%. There was no statistical difference in uterine volume reduction and dominant myoma size reduction whether occluding agents was polyvinyl alcohol, polyvinyl alcohol plus gelfoam, and gelfoam, and whether ultrasound measured Resistance Index value before the procedure was low or high.

**Conclusion:** Primary candidates for uterine artery embolization include those with symptomatic uterine leiomyomas who no longer desire fertility but wish to avoid surgery or are poor surgical risks. To our study, uterine volume reduction and dominant myoma size reduction in patients who had adenomyosis were similar to previous other studies in patients who had not adenomyosis. Therefore adenomyosis should not be considered as a contraindication for uterine artery embolization. Because there is little data about subsequent reproductive potential after this procedure, it should not be routinely advocated for infertile women. Further investigation is warranted for occluding agents and Resistance Index.

**Key Words:** Uterine artery embolization, Leiomyoma, Adenomyosis, Occluding agent, Resistance index

가  
 , .40 가 가  
 40% 가 가 , 2000 2,000 6,000  
 , 39 . ,  
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 . , .1 .5 ,  
 , 600,000 ,  
 , 73,000 가 가 ,  
 , 25 30% 가 가 , 1998 1  
 . 7 10 2000 10  
 , 2 3 37  
 , 가 가  
 , ! ,  
 , Resistance index (RI) 가

(Gonadotropin regulating hormone agonist)

1.  
 2000 WM Liu가 1998 5 2000 10  
 ,<sup>2</sup> Nd-YAG  
 , Pirfenidone 37  
 .<sup>3</sup>  
 7 Lariboisiere JH Ravina가  
 1988 가 40 , Doppler  
 Resistance index  
 Resistance index (RI)  
 1995 Lancet 4 , ,  
 , , alcohol , polyvinyl alcohol gelfoam

**Table 1.** Characteristics of Patients Undergoing Uterine Artery Embolization

Total Number	37
Age	40.0 years (25~65)
Initial Hemoglobin	9.9 mg/dL (4.8~14)
Initial Hematocrit	30.9% (15.7~41.7)
Uterine Volume Reduction	34.4%
Dorminant Myoma Size Reduction	86%
Duration of Follow-up Sonogram	6.9 months (1~28)
Duration of Total Follow-up	12.8 months (1~31)

**Table 2.** Current Symptoms of Patients

	Number	Percent
Bleeding	21	57%
Dysmenorrhea	9	24%
Abdominal Pain	8	22%
Back Pain	3	8%
Urinary Symptoms	4	11%
No Symptoms	4	11%

**Table 3.** Indications of Uterine Artery Embolization

	Number	Percent
High Operation Risks	10	27%
Adjuvant to Myomectomy	5	14%
Previous Myomectomy	3	8%
Previous GnRH analogue treatment	3	8%

gelfoam  
 2.  
 29 , 3  
 5 .4  
 French 5 French Glide cobra catheter (Terumo, Tokyo, Japan)  
 (Tracker 325, Boston Scientific, Watertown, Miami, USA)  
 polyvinyl alcohol (contour, Boston Scientific, Watertown, Miami, USA) 350~500 ì m 500~700 ì m 19 , gel foam (spongostan, Johnson & Johnson, Gargrave, UK)  
 6 , 7 가  
 가  
 1  
 30 .  
 3.  
 one-way  
 ANOVA , p value <0.05  
 40 ( 25~65 ) 가 가 , 86% (n=19) 가

, 6  
 1  
 (Table 1).  
 57% (n=21) ,  
 54% (n=20),  
 11% (n=4) ,  
 가 11% (n=4) (Table 2).  
 (Gonadotropin regulating hormone agonist) 8% (n=3)  
 8%  
 가 27%  
 (n=3) , 가  
 (n=10) ,  
 14% (n=5) (Table 3). 11 , 73% (n=29)  
 1.59 ± 0.8  
 , 59% (n=22), 3%  
 (n=1), 24% (n=9),  
 가 11% (n=4) . 10% (n=3)  
 가 가 , 90% (n=26)  
 . 14% (n=3)  
 가 가 , 86% (n=19) 가

**Table 4.** Correlations between Uterine Volume Reduction (UVR), Dominant Myoma Size Reduction (MSR) and Resistance index (RI) changes of Myoma Feeding Vessels (MFV), Right Uterine Artery (RUI), Left Uterine Artery (LUI)

	RI changes of MFV	RI changes of RUI	RI changes of LUI
UVR	0.389 (p=0.300)	0.344 (p=0.210)	-0.469 (p=0.078)
MSR	-0.253 (p=0.681)	0.362 (p=0.304)	-0.066 (p=0.857)

**Table 5.** Uterine Volume Reduction (UVR) and Dominant Myoma Size Reduction (MSR) After Using Different Embolizing Material (Polyvinyl alcohol, Polyvinyl alcohol and gelfoam, gelfoam)

	Number	Mean (%)	p value
<b>UVR</b>			
PVA	13	32.2	0.856
PVA+gelfoam	7	27.0	
Gelfoam	5	34.0	
<b>MSR</b>			
PVA	9	58.9	0.296
PVA+gelfoam	6	33.5	
Gelfoam	4	40.0	

polyvinyl alcohol, polyvinyl alcohol gelfoam, gelfoam

polyvinyl alcohol gelfoam, 가 (Table 5), 79%, 가 25%, 14%

Heaston DK 1979, gelatin sponge, 34.4%, 86%, (1~28), 12.8 (1~31), Resistance index (RI) (Pearson correlation coefficient = 0.389) (p value = 0.300), 18, 가, Yamashita Y 1994, 17, 7, 10, McIvor J 1996, 7, 10, Volgelzang RL 1991, 4, 11, 8, 가, (Pearson correlation coefficient = -0.469, -0.066, Table 4).

JH Ravina 1995 34 49 16 20 5  
(11 48 ) 75% 가 ,  
11  
, 10 , 2000 1,730  
2 32 7  
, <sup>4</sup> Goodwin SC 1997 11  
5.8 (2 가 ,  
9 ) 가 40%  
, 가 가 60%  
65% 가 .<sup>12</sup> JH Ravina 가 2000 JH  
1997 88 Ravina 184  
6 60 9 12 7  
9 , 6 , 4  
69% ,<sup>13</sup> Bradley 3 ,  
EA 1998 31 48 8 20 2 37 41  
가 3 1179.0 cm<sup>3</sup> 583.3 가 .<sup>16</sup> ,  
cm<sup>3</sup> .<sup>14</sup> 1% 2%  
6.9 14% (n=3) , 2000 Spies  
가 가 66 4  
, 34% , (Follicle stimulating hormone) 3.5 mIU/ml  
86% 가 .<sup>17</sup>  
1998 Worthington-Kirsch RL 1997 Goo- , Stancato-Pasik A 1997  
dwin SC 3 gelfoam 1 6  
가 85% 90% ,  
,<sup>15</sup> 1998 Bradley EA 7 , McLvor J  
6 , polyvinyl alcohol,  
.<sup>14</sup> 1996 7  
coil, gelfoam 3  
가 .<sup>10</sup> ,  
. 7 cm , ,  
, 가 가  
가  
, 8 cm , Bradley EA,  
가 , JH Ravina, Goodwin SC

가 13  
 1 1  
 가 , 가 .<sup>22</sup> , Goodwin Sc 1999  
 가 . 가 3 ,<sup>18</sup> 2000 Siskin GP  
 Bradley JH . 1998 가 14 , 11 10  
 25 , 6 47%  
 ,<sup>14</sup> 1999 Goodwin Sc 59 .<sup>23</sup>  
 가 ,  
 1390 cm<sup>3</sup> ( 370 cm<sup>3</sup>~2880 cm<sup>3</sup>)  
 510 cm<sup>3</sup> .<sup>18</sup>  
 , 1998 Goodwin SC  
 Djabbari M 1999  
 ,<sup>19</sup> 1999 Mclucas 300  
 15% ,<sup>24</sup>  
 8.7 cm 가 ,  
<sup>20</sup> 가 가  
 가  
 가 ,  
 가 .  
 Resistance  
 90% index (RI) 가 ,  
 86% 가 .  
 34.4% 가  
 Resistance index (RI)  
 40%~69% .  
 20%  
 가  
 polyvinyl alcohol gel-  
 foam 가 polyvinyl alcohol  
 1999 Smith SJ gelfoam  
 ,<sup>21</sup> 1999 Goodwin  
 SC 5 , polyvinyl alcohol gelfoam  
 3 가  
 ,<sup>18</sup> 1999 Stancato-Pasik 가  
 가



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