

Uterine artery embolization for symptomatic fibroids and adenomyosis: assessment by MRI.

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Introduction

1. To describe the MRI changes at 3 months and up to 1 year after uterine artery embolization in patients with symptomatic fibroids and concomitant adenomyosis.
2. To evaluate the MRI features of focal versus diffuse adenomyosis after uterine artery embolization.
3. To evaluate the clinical response of patients with coexisting adenomyosis and fibroids after uterine artery embolization.

Methods

Twenty-six patients (mean age= 45.7 yr.) with symptomatic fibroids and concomitant adenomyosis (junctional zone thickness>12 mm) were treated with uterine artery embolization(UAE). MR imaging was performed prior to UAE, and at 3 months (22pts) and 1 year (11pts) after UAE, with 7 patients imaged at both 3 months and 1 year after treatment.

MR imaging was performed with orthogonal T2-W HASTE images, axial T1-W fat-saturated spoiled-gradient echo, and sagittal T1-W spoiled-gradient-echo pre-and post-gadolinium images in 22/26 patients pre-UAE, 20 patients presenting 3 months post-UAE, and all 11 patients at 1-year follow-up. High resolution T2-W fast spin-echo sagittal images were acquired in 7 patients pre-UAE, and 10 patients at 3 month and 1 year follow-up post-UAE. Four patients were evaluated with orthogonal T2-W fast spin-echo and T1-W conventional spin-echo images with delayed phase gadolinium enhanced T1-W spin-echo images.

The volume of the uterus and up to 2 index fibroids, including the largest submucosal fibroid (total= 49 index fibroids pre-UAE) was measured.

The region of maximal thickness of the junctional zone (JZ), as well as the total myometrial thickness in the same location was measured in each patient pre- and post-UAE. A ratio of junctional zone thickness to myometrial thickness was derived. Adenomyosis was characterized as diffuse(n=17) or focal(n=9), and the presence of high signal foci on T1-W and T2-W images was noted. The enhancement pattern of adenomyosis was compared to normal adjacent myometrium.

Responses from symptom questionnaires at 3 months and 1 year after treatment were analyzed, and the symptoms of bleeding or pain/pressure were reported as improved, no change, or worse from each of two symptom categories.

Results

There was a decrease in mean uterine volume from 526.1cc pre-UAE to 329.5 cc at 3 months (p<.00005). There was a slight further decrease in mean uterine volume at 1 year at 292.6cc, but this did not reach statistical significance.

The mean fibroid volume pre-UAE was 92.56cc, which decreased to 47.4cc at 3 months (p<.01), with no significant change at 1 year.

In patients with diffuse adenomyosis there was a decrease in mean JZ thickness from 23 mm to 18 mm (p<.001) at 3 months, while focal adenomyosis decreased from 38 mm to 31mm(p<.02). However there was no significant change in the JZ/MY ratio in either group, with a mean ratio of .75 prior to UAE,.74 at 3 months, and .59 at 1 year.

No significant change in the number of high signal intensity foci was seen on T1 or T2-W images.

Enhancement decreased in 6/9 patients with focal adenomyosis, while only 2/17 patients with diffuse adenomyosis showed a similar pattern.

Of the 25 patients presenting with bleeding, 22(88%) report moderate to marked improvement, with 19/21(91%) patients presenting with pain/pressure report moderate to marked improvement. 2 patients reported little change in one presenting symptom, but improvement in the other, while one patient reported worsening of one symptom, but moderate to marked improvement in the other.

Discussion

Adenomyosis often coexists with uterine fibroids, and may present with identical symptoms. As hysterectomy is the definitive treatment

for adenomyosis, the response of this entity to uterine artery embolization is a relevant clinical question. Furthermore, diffuse adenomyosis may respond differently to UAE than focal adenomyosis.

Our results show a decrease in the junctional zone thickness following UAE, but no significant change in the junctional zone/myometrial ratio. This finding may reflect a decrease in the uterine volume as fibroids infarct. The decrease in enhancement seen in 67% of patients with focal adenomyosis suggests that focal disease may have a different vascular pattern, and may undergo necrosis. Further imaging studies are needed to confirm these findings.

As patients report significant improvement in presenting symptoms, the presence of concomitant adenomyosis should not be considered a contraindication to uterine artery embolization.

References

- 1.RAVINA JH, HERBRETEAU D, CIRAU-VIGERON N, ET AL. LANCET 346,671-672, 1995.
- 2.GOODWIN SC, VENDANTHAM S, MCLUCAS B, ET AL. JVIR 8, 517-526, 1997.
- 3.BRADLEY EA, REIDY JF, FORMAN RG, ET AL. BR J OBSTET GYNAECOL 105, 231-234,1998.
- 4.SPIES JB, SCIALLI AR, JHA RC ET AL SCVIR 10, 1149-1157,1999
- 5.REINHOLD C, McCarthy S, BRET PM. RADIOLOGY 199,151-158, 1996
- 6.OUTWATER EK, SEIGALMAN ES, VAN DEERLIN V. AJR 170,437-441,1998
7. SMITH JS, SEWALL LE, HANDELSMAN A. JVIR, 10,1171-1174,1999.
8. BROSENS JJ, DESOUSA NM, BARKER FG. THE LANCET, 346,558-60,1995
- 9.SISKEN G, TUBLIN M, STAINKEN B ET AL JVIR 11,191,2000.
10. AHN C, LEE W, SUNWOO T,ET AL JVIR ,11,192,2000.