

# Submucosal Leiomyoma in a Woman with Post-menopausal Bleeding – Diagnostic Dilemma, Ultrasound vs MRI: A Case Report

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## ABSTRACT

**Introduction:** We are reporting a case of submucosal leiomyoma in a post-menopausal woman with a history of bleeding, which mimicked endometrial hyperplasia on ultrasound and was considered as a case of endometrial carcinoma.

**Case Presentation:** A 44-year-old female who had attained menopause 04 yrs back, presented with on and off bleeding per vagina since one month.

An ultrasound which was done outside our hospital, reported a markedly hypertrophied endometrium (24mm). She was not on any hormonal medications. Endometrial carcinoma was considered as a cause. Dilatation and curettage was done and

the histopathology report showed atypical cells which were suggestive of malignancy. She was referred for MRI of the pelvis for further evaluation. The MRI was suggestive of a large, pedunculated, submucosal leiomyoma which protruded into the endometrium. A panhysterectomy was performed and the histopathology reports confirmed the leiomyoma.

**Conclusion:** Ultrasound, as an initial modality of imaging, was not able to differentiate between the marked endometrial hypertrophy which was considered as endometrial carcinoma and the submucosal leiomyoma. MRI was helpful in reaching the diagnosis.

**Key Words:** Submucosal leiomyoma. Endometrial carcinoma

## INTRODUCTION

Bleeding is the most common symptom of the endometrial carcinoma in post-menopausal woman. A transvaginal sonography or /and endometrial biopsy is performed as the initial procedure of the choice for the evaluation of the post-menopausal bleeding. An endometrial thickening which is seen on ultrasound is a non-specific finding. MRI can be helpful in further differentiating the causes of the endometrial thickening. The presence of a myometrium invasion should suggest a diagnosis of endometrial carcinoma or some other uterine malignancy. The diagnosis of benign lesions on MRI is favoured by a lack of invasion of the myometrium, the presence of a fibrous core and a well-defined sessile or pedunculated mass or the presence of an endometrial cyst.

## CASE HISTORY

A 44-year-old woman had attained menopause 04 yrs back and she presented with on and off bleeding per vagina of one month's duration. An ultrasound which was performed, reported a hypertrophied endometrial (approx width 24 mm). She was considered to be a case endometrial carcinoma and was subjected to a diagnostic dilatation and curettage. Her histopathology report revealed atypical cells which were suggestive of malignancy. The ultrasound was repeated after a few days and a similar status of the hypertrophied endometrium was reported. She was referred for MRI for further evaluation.

The MRI study showed a large (approx size 3.5 × 2.4 cm), well-defined, hypointense mass on the T2Wt image, which was found to occupy the endometrial cavity and it was surrounded by a thin hyperintense fluid layer all around it, except on its left lateral location,

which showed flow voids entering into it from the left side of the adnexa. This led to the interpretation that it was a submucosal mass which protruded into the endometrial region with a small vascular pedicle at the left lateral aspect and that it was wrapped by the endometrium which was seen as a hyperintense layer all around it, except at the level of the pedicle, which had protruded towards the endometrium. The mass was found to be isointense on the T1Wt image, which was non-contributory. The diffusion B1000 images showed no brightness in the lesion and the thin layer of endometrium became less bright, which was suggestive of the presence of fluid in the endometrium. The ADC (apparent diffusion coefficient) showed a high value ( $1.036 \times 10^{-3} \text{ mm}^2/\text{sec}$ ) in the lesion, which was suggestive of a benign pathology. The ADC values are low ( $0.766 \times 10^{-3} \text{ mm}^2/\text{sec}$ ) in endometrial carcinoma. An MRI diagnosis of a submucosal leiomyoma with a vascular peduncle was made.

She was retrospectively reviewed by ultrasound and it showed a large slightly hyperechoic mass occupying the entire endometrial region, which was surrounded by a thin echogenic rim. It was difficult to make to differentiate between the hypertrophied endometrium and the submucosal fibroid.

She was operated and the histopathological report confirmed the leiomyoma.

## DISCUSSION

Leiomyomas (also called fibroids) are the most common uterine tumours. The incidence of leiomyoma by the age of 50 is more than 80% in pre-menopausal women [1]. They shrink after menopause, in the absence of post-menopausal oestrogen

replacement therapy, as they are oestrogen dependent tumours [2]. The post-menopausal incidence of leiomyomas is not lower than the premenopausal incidence, although post-menopausal leiomyomas are smaller and fewer [3]. Leiomyomas are benign, well circumscribed, smooth muscle cell neoplasms and they are sharply demarcated from the surrounding myometrium or endometrium, depending upon their locations. Leiomyomas can be submucosal, intramural, subserosal or cervical in location.

The least common of the various types of fibroid tumours are the submucosal fibroids (5%) [4]. Submucous leiomyomas are located just under the uterine mucosa (endometrium) and they may be either pedunculated or sessile. The two most common symptoms of fibroids are abnormal uterine bleeding and pelvic pressure. Although abnormal bleeding can occur with any of the three classes of fibroids, women with submucous fibroids seem to be particularly prone to this complication. Some fibroid tumours don't produce any symptoms at all.

Ultrasound remains the initial modality of choice for patients with suspected leiomyomas. However, ultrasound is neither as sensitive nor as specific as MRI. Ultrasound may not be able to differentiate leiomyomas from adnexal masses, congenital anomalies or fibroid like conditions, like adenomyosis, an endometrial polyp or a mass like appearance of the endometrial carcinoma. Although endovaginal ultrasonography increases the sensitivity and the specificity of ultrasound in identifying and localizing leiomyomas, in our case, the ultrasound investigation could not differentiate submucosal leiomyoma from endometrial hyperplasia.

MRI is the most accurate imaging technique which can be used for the detection and the localization of leiomyomas [5]. The leiomyomas usually appear on the T2Wt images as sharply marginated homogeneous areas of decreased signal intensity [6]. MRI may be used to identify the prolapsed submucosal leiomyomas with pedicles and it is helpful in identifying their vascularity, as in our case. The mean ADC value is further helpful in differentiating leiomyomas from endometrial carcinomas. 3Tesla MRI is better in determining the depth of the myometrial invasion of the endometrial carcinoma and it is equivalent to the use of 1.5Tesla MRI. Higher tesla MRI has a spatial Resolution and it provides a high gradient diffusion wt body imaging, which low tesla (0.2-0.5 Tesla) lacks. Our study was performed by using 3Tesla Siemens MRI.

A dynamic multiphase contrast study is performed for the staging of the endometrium carcinoma. The advantage is that it is more accurate than the T2Wt imaging for the assessment of the myometrium invasion, but the pitfall is that there is loss of junctional zone definition and that the band of subendometrial enhancement is seen in only 50-60% of the cases. A contrast study was not performed in our case.

In endometrial carcinoma, the uterus may appear entirely normal or the endometrial stripe may appear to be homogeneously widened (>08mm) in post-menopausal women [7]. In our case, the entire endometrium appeared to be thickened (24 mm) and hence, a diagnosis of endometrial hyperplasia (? endometrial carcinoma) was made, based on the ultrasound investigation. Alternatively, a heterogeneous signal intensity mass may be seen to be distended in the endometrial cavity. MRI is not recommended as a screening procedure in the diagnosis of endometrial carcinoma. On the T2Wt images, their signal intensity is commonly hyperintense; however, this is quite variable. Myometrial invasion is best visualized on the T2Wt images, where it appears as a disruption or an irregularity of the junctional zone which is caused by a mass of intermediate

signal intensity. Diffusion-weighted MRI (DWI,  $b = 0$  &  $1000 \text{ sec/mm}^2$ ) shows brightness in endometrial carcinoma and the mean ADC values are significantly lower in endometrial cancer ( $0.766 \pm 0.16 \times 10^{-3} \text{ mm}^2/\text{sec}$ ) [8]. It may also be able to demonstrate malignant tumours. The ADC value of the normal endometrium is  $1.53 \pm 0.10 \times 10^{-3} \text{ mm}^2/\text{s}$  and in endometrial hyperplasia, it is  $1.27 \pm 0.22 \times 10^{-3} \text{ mm}^2/\text{sec}$ . In our case, the mean ADC value was high ( $1.036 \times 10^{-3} \text{ mm}^2/\text{sec}$ ). DWI can provide excellent tissue contrast, based on the molecular diffusion and it may be able to demonstrate malignant tumours. Quantitative measurement of the apparent diffusion coefficient (ADC) may be valuable in distinguishing between the malignant and benign endometrial lesions. The DWI and ADC values provide additional information when they are added to the conventional MRI findings.

On MRI, the signal intensity of the endometrial polyps on the T2Wt images tends to be higher than that which is seen in endometrial carcinoma. The presence of a central focus of low signal intensity on the T2Wt images indicates a fibrous core, which suggests the diagnosis of an endometrial polyp [9]. Although these imaging features can help in distinguishing polyps from endometrial carcinomas, they are often not specific enough to avoid the need for a biopsy. Moreover, these two conditions frequently coexist.

In its focal form, adenomyosis appears as an ill-defined, poorly marginated area of a low signal intensity within the myometrium on the T2Wt images, whereas leiomyomas often appear as well-circumscribed masses. Small foci of high signal intensity in adenomyosis on the T2Wt images represent the endometrial glands. Some of these ectopic foci of the endometrium also have a high signal intensity on the T1-weighted images, a finding that corresponds to haemorrhage.

## CONCLUSION

MR imaging is currently considered as the most accurate imaging technique for the detection and localization of leiomyomas. Because of its ability to clearly demonstrate individual tumours, MR imaging has been shown to be more sensitive than ultrasound in the detection of leiomyomas.

## REFERENCES

- [1] Day Baird D, Dunson DB, Hill MC, Cousins D, Schectman JM. High cumulative incidence of uterine leiomyomas in black and white women: ultrasound evidence. *Am J Obstet Gynaecol*. 2003 Jan;188(1):100-7.
- [2] Rein MS, Barbieri RL, and Friedman AJ. Progesterone: a critical role in the pathogenesis of uterine myomas. *Am J Obstet Gynaecol* 1995; 172:14-18.
- [3] Cramer SF, Patel A. The frequency of uterine leiomyomas. *Am J Clin Pathol*. 1990 Oct;94(4):435-38.
- [4] Panageas E, Kier R, McCauley TR, McCarthy S. Submucosal uterine leiomyomas: diagnosis of the prolapse into the cervix and vagina based on MR imaging. *AJR* 1992; 159:555-58.
- [5] Ueda H, Togashi K, Konishi I, et al. Unusual appearances of uterine leiomyomas: MR imaging findings and their histopathologic backgrounds. *Radiographics* 1999;19 Spec No:S131-45.
- [6] Zawin M, McCarthy S, Scoutt LM, Comite F. High-field MRI and US evaluation of the pelvis in women with leiomyomas. *Magn Reson Imaging* 1990; 8:371-76.
- [7] Chaudhary S, Reinhold C, Guermazi A, Khalili I, Maheshwari S. Benign and malignant disease of the endometrium. *Top Magn Reson Imaging* 2003; 14:339-57.
- [8] Lin Y-C, Lin G, Chen Y-R, Yen T-C, Wang C-C, Ng K-K. Role of magnetic resonance imaging and the apparent diffusion coefficient at 3t in distinguishing between adenocarcinoma of the uterine cervix and the endometrium. *AJR February* 2008; 481: 190.
- [9] Grasel RP, Outwater EK, et al. Endometrial polyps: MR imaging features and its distinction from endometrial carcinoma. *Radiology* 2000;214: 47-52.

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