

**Specialty area:** Body-MRI: Optimize your Clinical Practice

**Title of Talk:** Benign Uterine Disease

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### Highlights

- Role of MR imaging in evaluating benign uterine disease
- Imaging tips for benign uterine disease using an algorithmic approach

### TARGET AUDIENCE

This presentation is targeted at sub-specialty and general radiologists, imaging scientists, technologists and radiology trainees who would like to improve their knowledge of diagnosing benign uterine conditions on MR Imaging using an imaging-based algorithmic approach.

### OUTCOME/OBJECTIVES

Attendees will be able to understand the indications and report the pertinent MR imaging findings when assessing patients with suspected benign uterine disease.

### PURPOSE

To promote a better understanding of the role of MR imaging in managing patients with benign uterine disease.

### DISCUSSION

Ultrasound is the imaging modality of choice for the initial evaluation of benign uterine disease. However, in patients whose sonographic findings are indeterminate or inconclusive, MR imaging can play an important role as a problem solving modality. Benign endometrial pathology such as polyps and hyperplasia are best assessed by endovaginal sonography, and as such the role of MR imaging in this setting is limited.

MR imaging of benign uterine disease is best performed using a pelvic multicoil array. An antispasmodic can be utilized prior to imaging, except in cases where it is contraindicated. The basic sequences for pelvic MR include a three-plane localizer followed by T1 and T2-weighted sequences in multiple planes. A short-axis T2-weighted image (coronal oblique) through the uterus is often helpful for evaluating a variety of uterine conditions. A long-axis T2-weighted image through the uterus is critical for classifying uterine anomalies, particularly the distinction between a septate and bicornuate uterus. Dynamic contrast enhanced sequences are mandatory for evaluating the endometrium and other selected indications.

MR imaging is the modality of choice for the accurate classification of uterine anomalies according to the American Fertility Society Classification [1-4]. The most important sign differentiating a septate from a bicornuate uterus is the absence of a fundal dip  $\geq 1$ cm. In other words, the fundal configuration of a septate uterus is typically convex outwards or flat. It may at times demonstrate a very small fundal dip, but this must not exceed 1 cm. A fundal dip  $\geq 1$ cm means that this anomaly must be classified as a bicornuate uterus. It is important to remember that the intercornual distance, angle of horn separation, and composition of the septum must not be used to differentiate a septate from a bicornuate uterus.

MR imaging can help in differentiating the cause for abnormal uterine bleeding in patients where sonography cannot distinguish between leiomyomas and uterine adenomyosis [5,6]. This is particularly important since leiomyomas can be treated medically or by a number of uterine sparing therapies, while deep adenomyosis is treated by hysterectomy. In addition, MR imaging allows for precise delineation of leiomyomas and their position with respect to the endometrial cavity, thus allowing optimal preoperative planning (open procedure myomectomy versus hysteroscopic removal). Dynamic MR imaging allows confident distinction between junctional zone thickening due to adenomyosis versus transient thickening caused by uterine peristalsis [7].

MR imaging is useful in the pre and post-procedural evaluations of patients undergoing uterine artery embolization (UAE) for symptomatic uterine leiomyomas [8-12]. Relative contraindications to this procedure include pelvic malignancy, desired future fertility, adenomyosis and pedunculated leiomyomas. Although adenomyosis is considered a relative contraindication, most advocate treatment if adenomyosis and leiomyomas co-exist. Fibroids with hemorrhagic degeneration have loss of vascular supply and therefore show poor response to UAE.

## CONCLUSION

MR imaging plays an important role as a problem solving modality in benign uterine disease. For certain disease indications, including complex uterine anomalies, the pre-treatment evaluation of uterine leiomyomas and uterine adenomyosis, MR imaging remains the modality of choice for optimal patient management.

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