SMRT Student Scope Submission

## Title and Author(s)

Include Title of your submission and any collaborator as co-authors

Title: Abnormalities of the Female Pelvis

Authors: Kelly A. Salvato R.T.(R)(M)

Carolyn Kaut Roth R.T.(R)(MR)(CT)(M)(CV) and Anthony P. Festa R.T.(R)(MR)
University of Pennsylvania Medical Center

Date of Submission: August 8, 2006

## Introduction or Patient History

A 55- year-old peri-menopausal female with abnormal uterine bleeding was referred to University of Pennsylvania Radiology by her doctor for an MRI of the pelvis. The study was ordered without gadolinium contrast enhancement. No previous study of any kind existed for comparison.

## Patient Preparation and Scan Set up

The procedure was explained to the patient. She was made aware of all details concerning her exam including the anticipated study time. A GE Signa 1.5 Tesla magnet was used to complete the exam. After a routine screening for ferrous objects, the patient was placed supine on the exam table with her feet entering the magnet. She was carefully centered over the torso coil and a wedged-shaped sponge was placed under her knees. The anterior torso coil was centered over her pelvis and secured into place. The patient received earplugs for noise reduction and a blanket for her comfort. She was instructed to remain very still.

**MR Imaging Parameters**

| Sequence | | FOV | Slices | TR ms | TE ms | Spacing mm | Matrix | NSA | Flip angle |
|---|---|---|---|---|---|---|---|---|---|
| ***Axial T2 FRFSE** | | 24 | 36 | 4000 | 120.4 | 5 skip 1 | 512x512 | 2 | |
| **Axial T1 GRE** | | 24 | 72 | 155 | 2.3 | 5 skip 1 | 512x512 | .75 | |
| **Axial FSPGR FS** | | 24 | 36 | 245 | 4.2 | 5 skip 1 | 512X512 | 1 | 75 |
| **Axial 2D Fiesta** | | 24 | 36 | 4.6 | 2.0 | 5 skip 1 | 512x512 | 1 | 70 |
| ***Sagittal T2** | | 34 | 30 | 665 | 103.1 | 5 skip 1 | 512x512 | 2 | |
| ***Coronal T2 FS** | | 34 | 26 | 5566.7 | 120.4 | 4 skip 1 | 512x512 | 2 | |
| **Axial IR FS** | | 24 | 48 | 5.2 | 1.9 | 4.4skip 1 | 512x512 | .730769 | 12 |
| **Coronal T2 FS** | | 34 | 26 | 5566.7 | 120.4 | 4 skip 1 | 512 x512 | 2 | |

* indicates image shown in following section

## Findings and Discussions

Immediately visualized on the T1 Sagittal scan was a large mass in the right uterine fundus. Some smaller masses were seen throughout the uterine body. Another mass could be seen on the left ovary. This was well demonstrated on the T2 axial and the T2 FSE coronal scans with fat suppression.

The largest mass measured 7.3 X 7.7 X 8.7 cm. according to the Radiologist's report. Smaller uterine body masses were not measured. Origin within the uterine muscle layer strongly suggested these growths were leiomyomas or fibroids. The adnexal (ovarian) mass measurement was 5.3 X 5.7 X 6.9 cm. The report identified this mass as a teratoma. A third mass in the posterior cervix measured 1.0 X 1.0 cm. The round appearance and signal differences (intermediate T1 signal and high T2 signal compared to that of muscle) indicated that this was a Nabothian cyst, a benign lesion.

Incidentally, a disc bulge at L5-S1 was reported by the radiologist along with a very small amount of free fluid in the pelvic cavity.

## Conclusions

Researching this case taught me a number of things about abnormalities of the female pelvis. First, fibroids are common in women over 30 years of age; 20-50% will develop them. They arise from the muscle layer and connective tissue of the uterus. Only 10-20% of patients with fibroids require treatment. Most are asymptomatic, but symptoms vary depending upon location, size, and number of tumors. The most common symptom, however, is menorrhagia; an increase in the amount and duration of menstrual flow. Pressure or abdominal discomfort is another symptom seen in patients with large fibroids. Treatments available are myomectomy which is the surgical removal of the fibroid or uterine fibroid embolization (UFE); an interventional procedure that blocks blood flow to the fibroids causing them to shrink over time. MRI is a constructive tool when considering treatment options because it provides a thorough examination of the uterus and surrounding pelvic organs. Also, MR angiography provides information about the fibroid blood supply.

The adnexal tumor was reported as a mature teratoma. Such masses are frequently unsymptomatic. Teratomas contain mostly fatty or sebaceous contents and are probably the result of an abnormal germ cell. These germ cells form groups of differentiated cells that grow to form the teratoma. Because of their location deep in the pelvic cavity, they often go unnoticed. Those larger than 7 cm. with solid components and complex structure pose the greatest concern for malignancy, however, over 99% of these tumors are benign. Surgical removal of teratomas is necessary if they threaten ovarian blood supply.

Finally, the Nabothian cyst is a benign fluid-filled cyst arising from the mucosal layer of the cervix. Nabothian glands produce mucous in and around the female reproductive tract. Occasionally they become clogged. A mucous accumulation forms in the gland appearing smooth and round on MR. These cysts are diagnosed considering both the shape and the signal differentiation they present. Such cysts require no treatment and generally resolve.

## References

Torigian, Drew A. MRI examination dictation, staff radiologist. University of Pennsylvania Medical Center. 11 May 2006.

Teng, Nelson. Adnexal Tumors. http://www.emedicine.com/MED/topic2830.htm. 2005. 31 May 2006

Thomason, Philip. Leiomyoma, Uterus (Fibroid.) http://www.emedicine.com/radio/topic777.htm. 2005. 31 May 2006.

Kandarpa, Krishna and John E. Aruny. Handbook of Interventional Radiologic Procedures. Philadelphia: Lippincott Williams & Wilkins, 3rd ed. 2002.

Evan Siegelman , Radiologist ,Director of MRI. University of Pennsylvania Medical Center. Personal Interview. 27 June. 2006.

**Images**

R

L

T2 Axial

Fibroid on the right and teratoma on the left

R

L