

### **Clinical utility of 3D T2 SPACE pulse sequence in MR imaging of female pelvis**

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**Purpose:** To evaluate the use of 3D T2 Space sequence in MR imaging of the female pelvis.

**Outline of content:**

**Introduction:** High resolution T2 weighted images in multiple planes is mandatory for providing good anatomical details of female pelvis. This is traditionally performed using 2D T2 weighted Turbo spin echo sequences in axial, sagittal and coronal planes oriented to the plane of the uterus or other organ of interest in the pelvis. This is technically challenging as well as time consuming and dependent on MR technologist's skills. 3D T2 weighted Turbo spin echo sequence performed in a single plane reduces the overall acquisition time and less operator dependency. Multiplanar reformatted images at variable slice thickness can be generated by the reading radiologist from the acquired data.

**Methods:** 45 women underwent MR imaging of the pelvis with both traditional T2 weighted TSE sequences and 3D T2 weighted TSE (SPACE) sequence at 3T MR unit (Siemens Trio). The indication for MR imaging included both benign pathology and staging of malignancy. Benign indications included uterine fibroids, adenomyosis, urethral diverticulum, ovarian cysts and endometriosis. Malignant indications included endometrial and cervical malignancy staging. The acquisition time, image quality and diagnostic yield of these two sequences are assessed.

**Results:** The mean image acquisition time for 3D T2 SPACE is about 7 minutes and for multiplanar 2D T2 TSE is about 15 minutes. The signal intensity as well as tissue contrast was higher with 2D T2 TSE images especially of fluid and fat. This contrast difference between the 2 sequences minimized with use of fat suppression. The endometrium and junctional zone is better visualized with 3D T2 SPACE images especially in adenomyosis and in uterus with multiple myometrial fibroids. No discrepancy in staging of cervical and endometrial cancers is appreciated between the two sequences. Urethral diverticula, uterine anomalies and adnexal masses had similar diagnostic yield with both sequences. Multiplanar reconstructions following 3D T2 SPACE was more useful in evaluation of uterine anomalies and endometrial lining in the presence of multiple fibroids and adenomyosis.

**Summary:** 3D T2 weighted TSE (SPACE) sequence is useful alternative to traditional 2D T2 TSE in MR imaging of the female pelvis. Though the tissue contrast and signal intensity is relatively high with 2D T2 TSE, the diagnostic yield is similar with both sequences. The decreased acquisition time, less dependence on technologist and multiplanar capability are advantages of 3D T2 TSE. Caution is expressed that the radiologist must familiarize with the low signal intensity images of 3D T2 TSE before replacing them with 2D T2 TSE in regular practice.