

Uterine contractility in women with postmenopausal bleeding differs depending on type of pathology: The WAVES study

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Objective

To investigate potential differences between uterine contraction features on ultrasound in benign versus malignant causes for postmenopausal bleeding.

Results

A total of 49 women were included (median age 57 years, IQR: 12, median BMI 27.4 kg/m², IQR: 8.9). Five women had endometrial carcinoma (EC), with a Median age of 73 years (IQR: 5.5) and constituted the oldest group. Among those with benign conditions, 37 had atrophic endometrium or minor proliferative activity, while seven had endometrial polyps. Seven women were using hormonal replacement therapy, 12 had uterine fibroids.

Uterine contractility

- *Contraction velocity* from the cervix to the fundus was significantly lower in women with EC (median 0.38, IQR: 0.36) than in women with atrophy (median 0.62, IQR 0.25, P=0.032).
- *Contraction direction* varied by pathology: atrophy showed a cervix to fundus direction (median -0.094, IQR: 0.429), EC exhibited a non-specific direction (median 0.010 IQR: 0.362), whilst polyps demonstrated a fundal to cervical direction (median 0.087 (IQR: 0.441, P=0.035).
- *Contraction frequency* was lower in EC compared to benign causes although this difference remained insignificant (P=0.921).
- *Contraction amplitude* was lower in EC cases than in polyp cases, with a trend observed (respectively; median 0.050, IQR: 0.045 versus 0.080, IQR: 0.047, P =0.060).
- Contractions were least coordinated in women with EC; however, not statistically significant (P =0.544).

Methods

This single-center prospective cohort study at Catharina Hospital Eindhoven included women with postmenopausal bleeding. Participants underwent a 2–4-minute transvaginal ultrasound (TVUS), and uterine contractility was assessed using speckle tracking and strain analysis in **MATLAB** (shown in Figure 1). The Kruskal-Wallis test was used to analyse differences between groups.

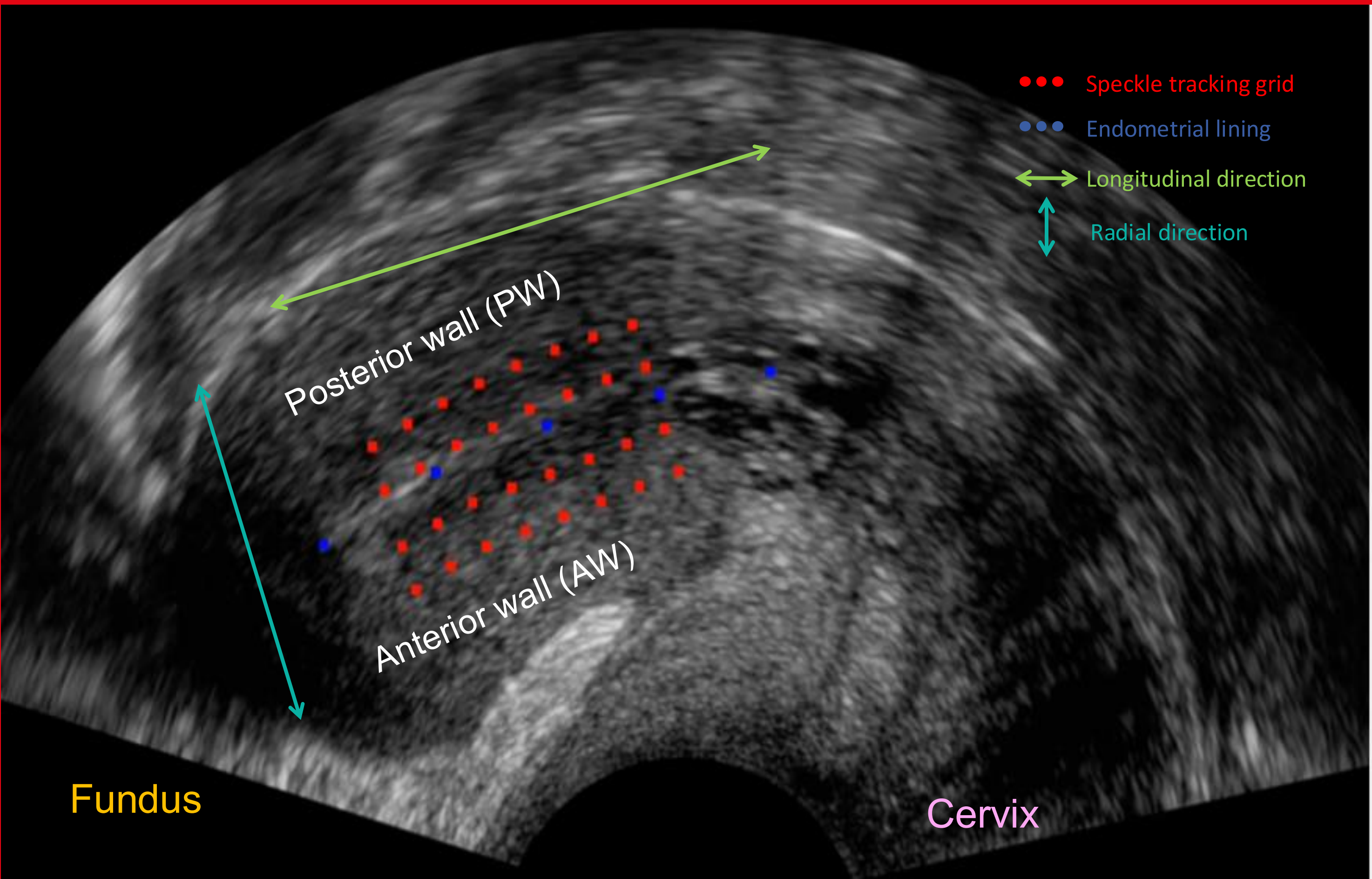
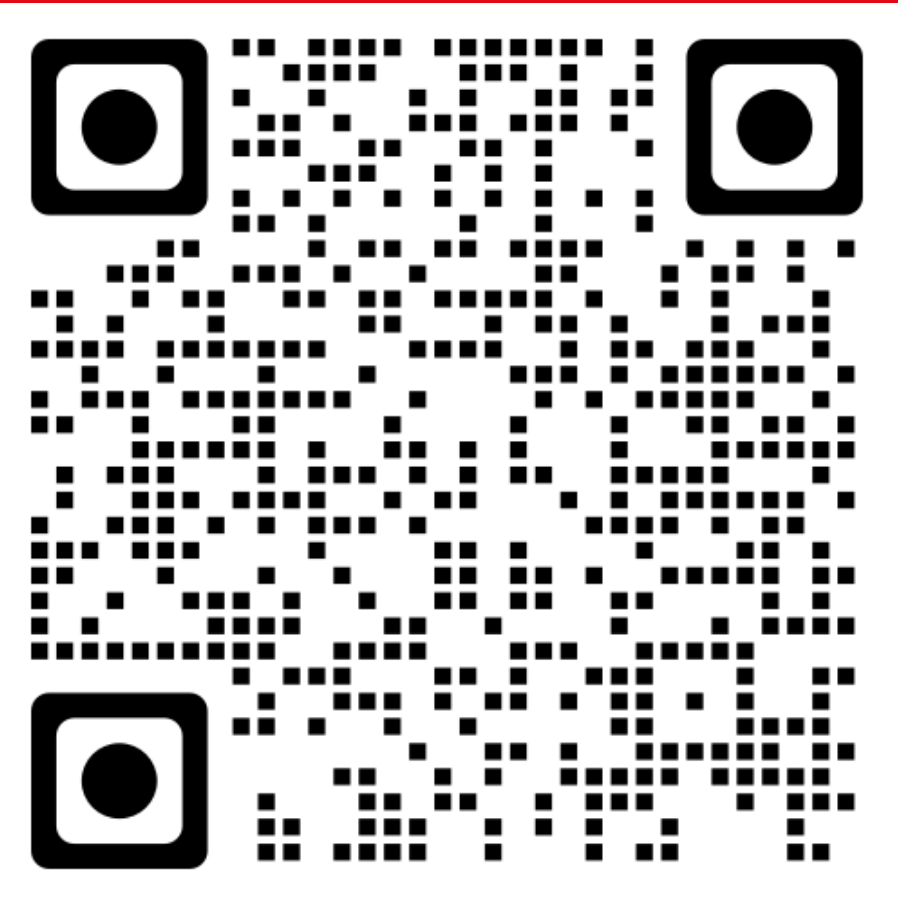


Figure 1: Uterus in sagittal plane conducted by TVUS. Blue lining indicates endometrium. Red dots indicate the speckle tracking grid conducted by MATLAB. Shown for anterior and posterior wall of the uterus, both in radial (blue arrow) and longitudinal (green arrow) direction of the uterus. TVUS: transvaginal ultrasound.



Scan for video experience



Conclusion

Further studies are needed to assess the potential role of uterine contractility in distinguishing between benign and malignant conditions.