



"The Twisting Sign": A Novel Indirect Ultrasonographic Marker for Diagnosing Deep Endometriosis

Fabio Barra^{1,2}, Simone Ferrero^{1,2}, Umberto Perrone², Giulio Evangelisti³, Alessandra Pulliero², Alberto Izzotti², Umberto L R Maggiore⁴ and Stefano Bogliolo⁵

1 IRCCS Ospedale Policlinico San Martino, Genoa, Italy; 2 University of Genoa, Genoa, Italy; 3 San Paolo Hospital - ASL2, Savona, Italy; 4 National Cancer Institute (INT), Milan, Italy; 5 P.O. "Ospedale del Tigullio"-ASL4, Chiavari (GE), Italy

RCOG WORLD
CONGRESS 2025
23-25 June 2025 | ExCeL London

BACKGROUND and OBJECTIVE

Despite advances in the sonographic evaluation of deep endometriosis (DE), the **orientation and positioning of the uterus**—particularly in relation to posterior pelvic lesions—remain underexplored. To assess the **"twisting sign"** defined as uterine fundus rotation observed on transvaginal sonography (TVS), as a novel **indirect ultrasonographic marker for DE** and its correlation with specific endometriotic localizations and indirect signs of pelvic adhesions.

CONTEXT

A total of 158 **women of reproductive age with pelvic pain** requiring specialist evaluation underwent **standardized TVS assessments** performed by an experienced operator, following the International Deep Endometriosis Analysis (**IDEA**) consensus **criteria**[#].

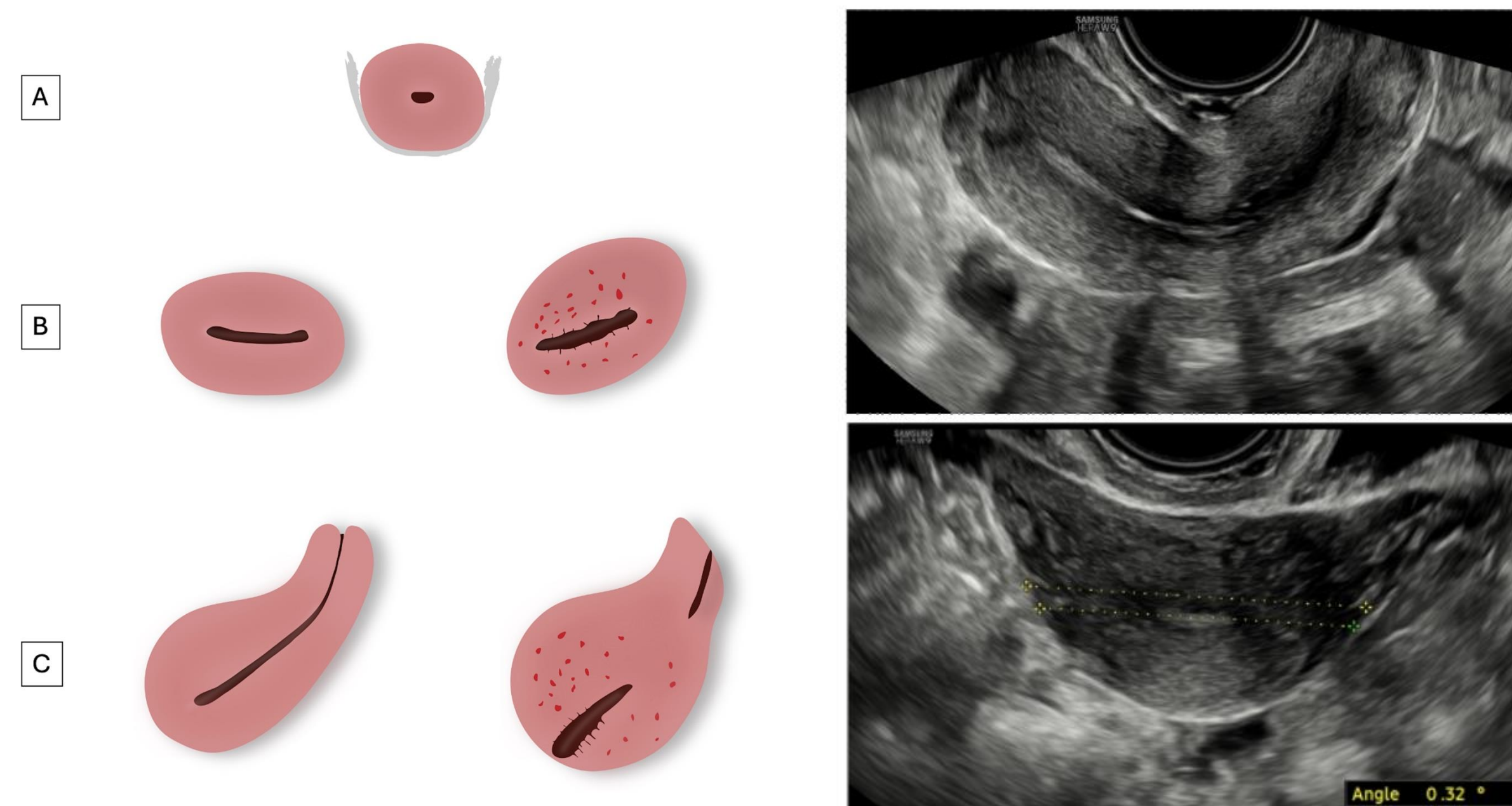
The **"twisting sign"** was defined as a **uterine rotation angle between 15° and 90° in the fundal transverse section** (*see below*).

Women with a history of pelvic surgery, large myomas (>3 cm), uterine malformations, or pelvic inflammatory disease were excluded.

Statistical analyses included multivariate logistic regression to assess the **association between the "twisting sign," DE localizations, and indirect DE signs**.

Transvaginal ultrasonography assessment for the uterine "twisting sign".

The probe is positioned at the cervix and gently retracted to reduce pressure, capturing a transverse cervical view (*Panel A*) where hyperechoic uterosacral ligaments appear horizontally. The probe is advanced cranially to visualize the upper uterine cavity (*Panel B*). The uterine rotation angle, measured between a transverse reference line and a tangential line along the endometrial echo near the interostial line, defines the presence of the twisting sign if between 15°–90°. *Panel B* illustrates negative (horizontal echo, minimal rotation) versus positive twisting signs (inclined echo, rotation $\geq 15^\circ$) in the trasversal section. *Panel C* contrasts negative (continuous echo) and positive twisting signs (interrupted echo requiring probe rotation) in the longitudinal section.



Physiological uteri in longitudinal (above) and transverse (below) views, showing no pelvic endometriosis and absence of the "twisting sign" (uterine rotation angle $<15^\circ$), indicative of no uterine axis rotation.

RESULTS

The **"twisting sign"** was observed in 24.1% of participants and was **significantly associated** with **posterior compartment DE**, including rectosigmoid nodules (20.7% vs. 3.9%, $p = 0.001$) and uterosacral ligament involvement (41.4% vs. 23.3%, $p = 0.046$).

Indirect signs of endometriosis, such as ovarian fixity to the uterine wall (37.9% vs. 19.4%, $p = 0.031$) and absence of the posterior sliding sign (37.9% vs. 9.3%, $p < 0.001$), **were more common** in patients exhibiting the "twisting sign."

Multivariate analysis confirmed the "twisting sign" as an **independent predictor of rectosigmoid nodules** (OR 9.8, 95% CI 1.6–58.8, $p = 0.012$) and **absence of the posterior sliding sign** (OR 6.6, 95% CI 1.8–24.3, $p = 0.004$).

Moderate-to-severe uterine adenomyosis was also **more prevalent** in patients with the "twisting sign" (24.1% vs. 7.8%, $p = 0.010$).

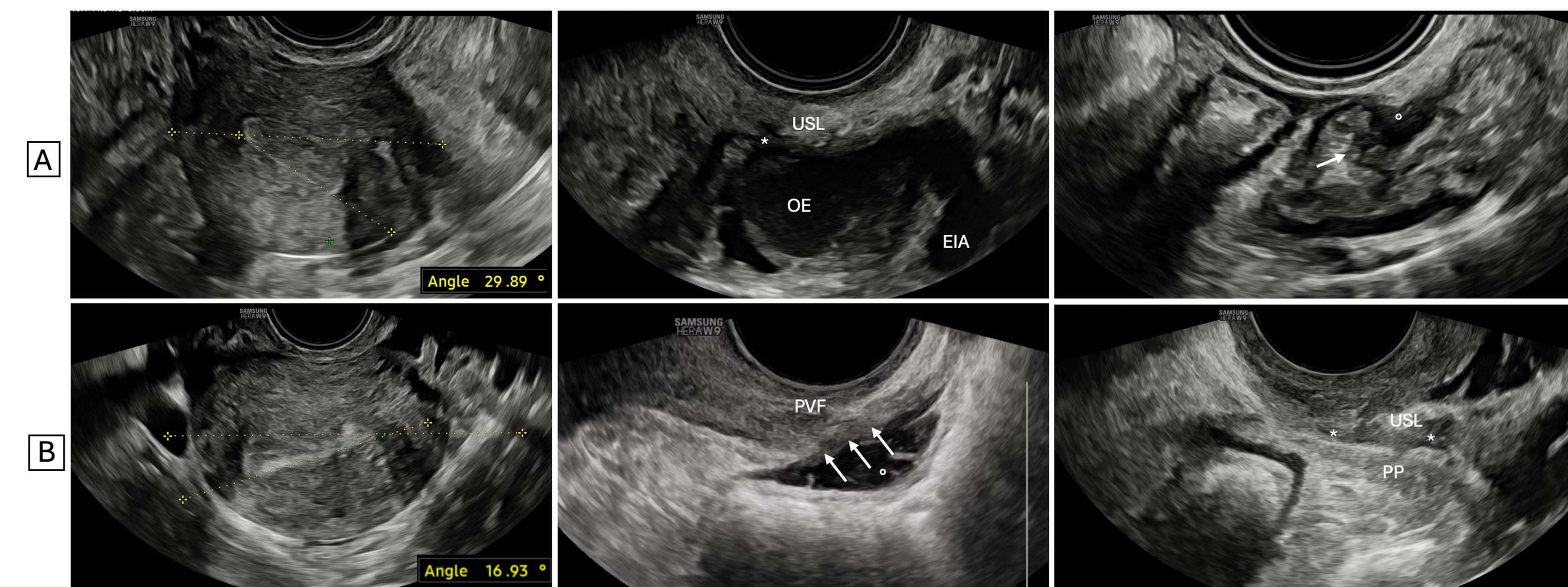


Illustration of positive "twisting sign" cases with significant uterine axis rotation.

•**Case A:** Left ovarian endometrioma attached to the uterine wall, deep endometriotic nodules in the left uterosacral ligament and an 8 × 6 mm rectosigmoid nodule causing muscular infiltration and early submucosal invasion.

•**Case B:** Extensive infiltration (22 × 11 mm) in rectum, rectovaginal septum, and posterior vaginal fornix, with an additional deep nodule in the right uterosacral ligament and ipsilateral posterior parametrium. Both cases exhibit adenomyosis features (hyperechoic islands, myometrial cysts, globular uterus) and absent posterior sliding sign, consistent with pelvic compartment obliteration.

CONCLUSION

The **"twisting sign"** may represent a novel and **potentially valuable ultrasonographic marker** of DE, particularly in the posterior pelvic compartment. It likely **reflects mechanical distortion** of the uterine axis **due to DE nodules and adhesions**. Prospective multicenter validation is warranted.