

Imaging strategies in Gynecology when to use ultrasound or MRI Defining Appropriate Use in Clinical Practice

Ep13.7

Dr. Rehab Raafat MD .Ph.D. Consultant Women's and fetal imaging

Objectives

To evaluate the diagnostic contribution of ultrasound and MRI in common gynecologic conditions and to define clinical scenarios in which MRI provides incremental value beyond ultrasound

patient and method

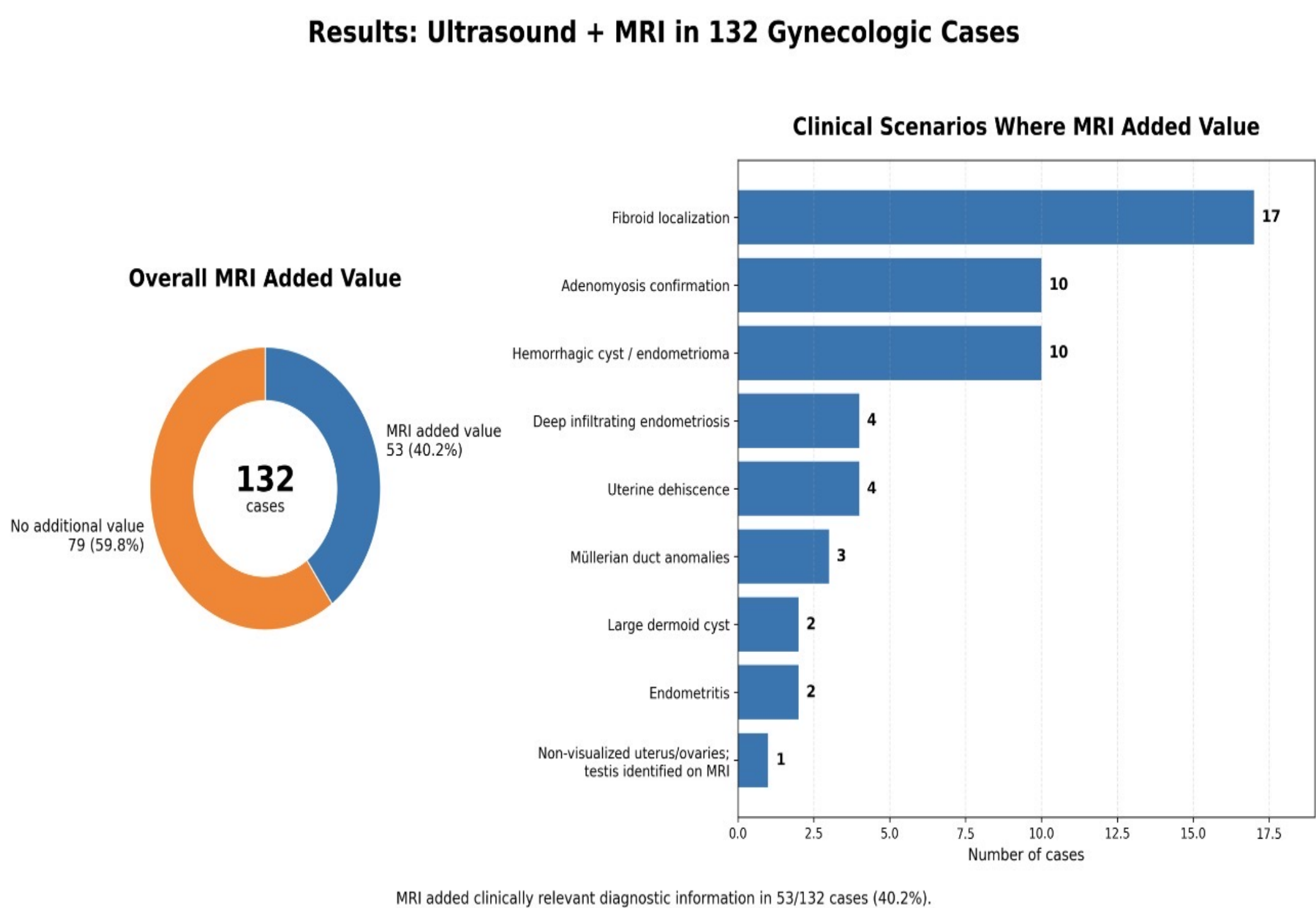
A retrospective cohort of **132 patients** referred for gynecologic imaging was reviewed.

All patients underwent **pelvic (TA/TV) ultrasound followed by MRI**. MRI findings were assessed for additional diagnostic information beyond ultrasound, particularly regarding lesion characterization, anatomical relationships, disease extent, and treatment planning.

The study included cases of **endometriosis, adenomyosis, uterine lesions, Müllerian duct anomalies, adnexal masses, uterine dehiscence, and pelvic inflammatory conditions**.

Results

Of 132 patients, **MRI provided additional diagnostic value in 53 cases (40.2%)**. In the remaining **79 cases (59.8%)**, MRI did not provide significant additional diagnostic information beyond ultrasound.



Discussion

Expert ultrasound remains the **first-line investigation** for most gynecologic conditions.^{1–3}

In this study, MRI provided additional value in approximately **one-third of cases**, particularly when assessment of **deep disease, tissue characterization, lesion location, or complex pelvic anatomy** was required.

The greatest benefit was seen in **deep infiltrating endometriosis adenomyosis, endometrioma, fibroid lesions, Mullerian duct anomalies and several adnexal pathology**. MRI also provided important diagnostic information in selected unusual cases, including non-visualization of pelvic organs on ultrasound and discovered testicles in MRI .

References

- 1.Young SW, Jha P, Chamié L, et al. Society of Radiologists in Ultrasound Consensus on Routine Pelvic US for Endometriosis. *Radiology*. 2024;311(1):e232191.
- 2.Bazot M, Bharwani N, Huchon C, et al. European Society of Urogenital Radiology (ESUR) guidelines: MR imaging of pelvic endometriosis. *Eur Radiol*. 2017;27:
- 3.American College of Radiology. **ACR Appropriateness Criteria®: Clinically Suspected Adnexal Mass, No Acute Symptoms**. Revised 202

Conclusion

Expert ultrasound should remain the **first-line imaging modality in gynecologic practice**, with MRI reserved for selected cases where it provides incremental diagnostic value.

A **stepwise ultrasound-first approach followed by targeted MRI** can improve diagnostic confidence, better define disease extent and anatomy, and support appropriate clinical and surgical management while avoiding unnecessary imaging.

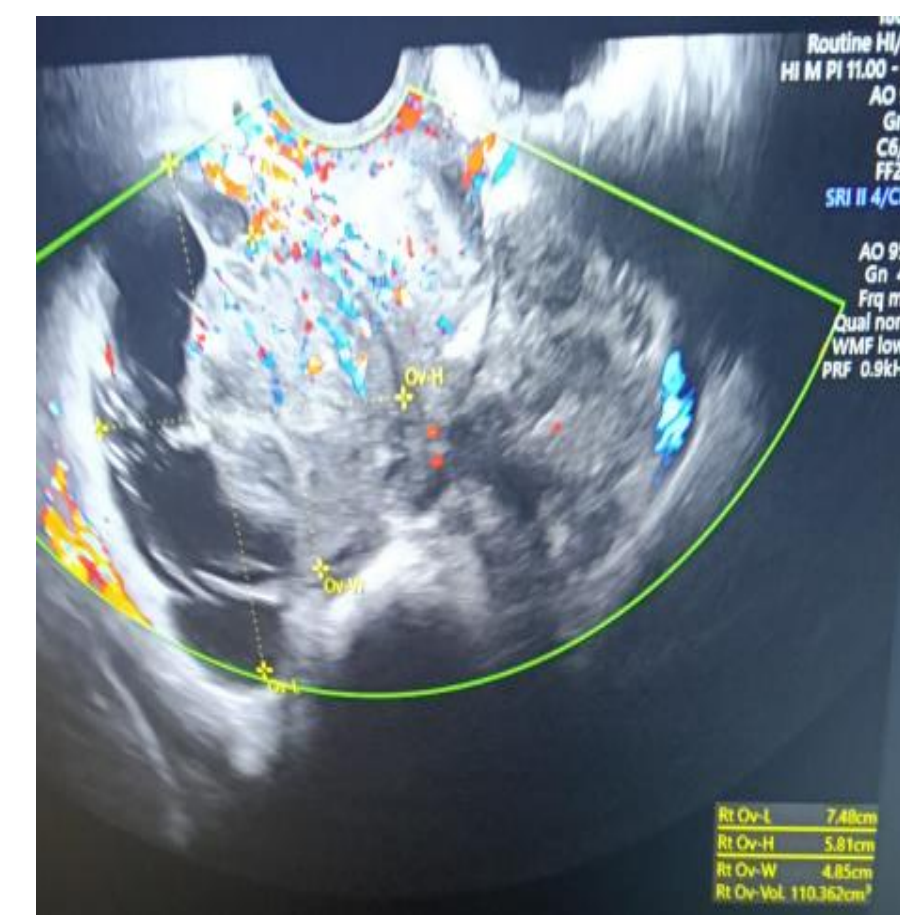


Figure 1. 2D TVUS with color Doppler shows Bilateral adnexal complex cystic masses with increase vascularity on colour Doppler .

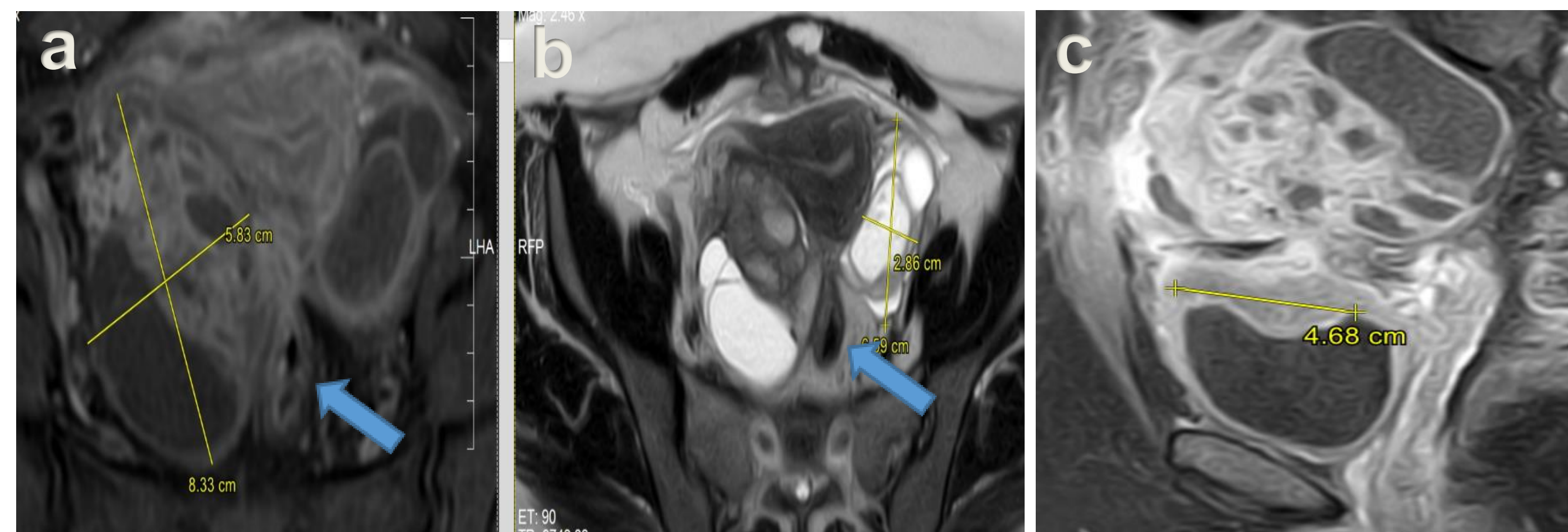


Figure 2 pelvic MRI of deep infiltrating endometriosis (a). T1WI coronal view , (b).T2WI coronal view shows Bilateral adnexal complex cystic masses are seen larger on the Right (8.3x5.8 cm) , left=6.6x2.9 cm . the right ovary is bulky 7.4x3.6 cm entangled within a multilocular cystic lesion (peritoneal inclusion cyst) . Both ovaries are kissing ovaries with tethering of the sigmoid suggestive of pelvic adhesions (blue arrow) (c) T1 WI post contrast showed enhancement in the ovary.

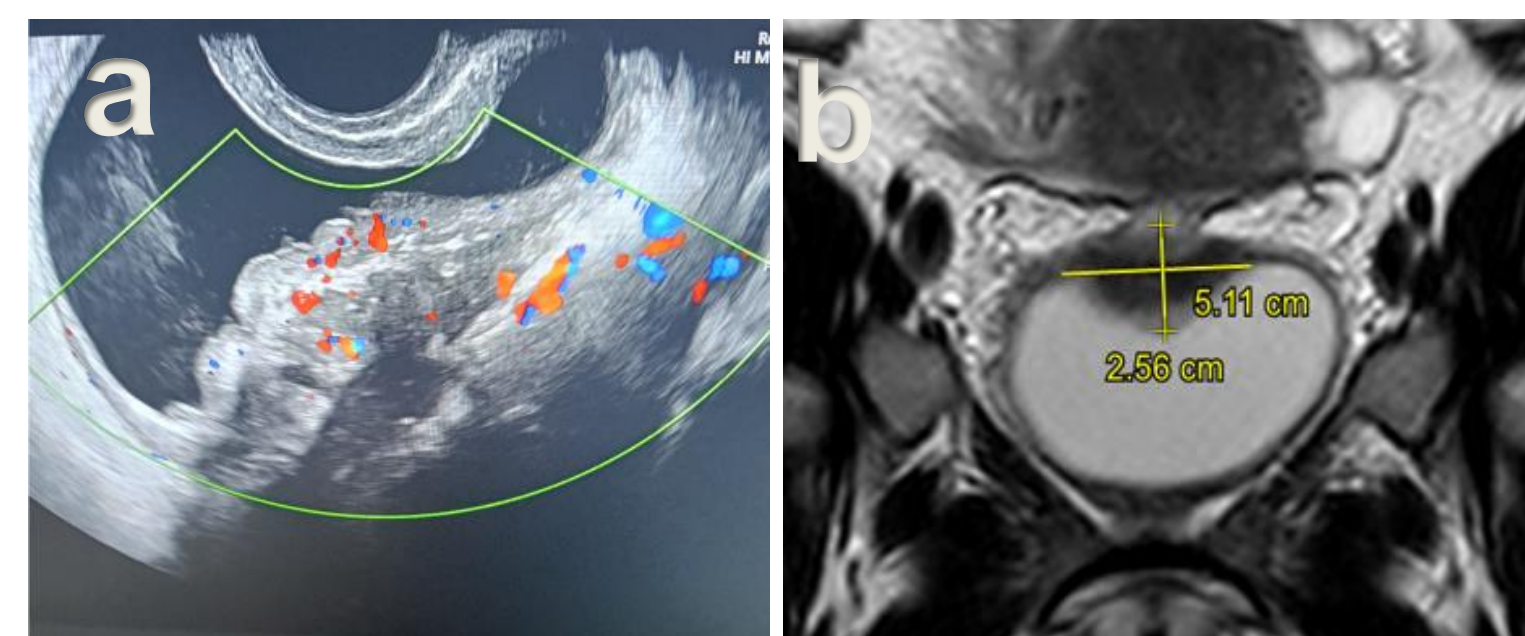


Figure 3. (a)2D TVUS with color Doppler , b. T2WI coronal views shows The urinary bladder Dome & posterior wall thickening infiltrating the wall , obliterating the vesico-uterine space and attached to the uterus , hypointense in T2 with faint enhancement post contrast .

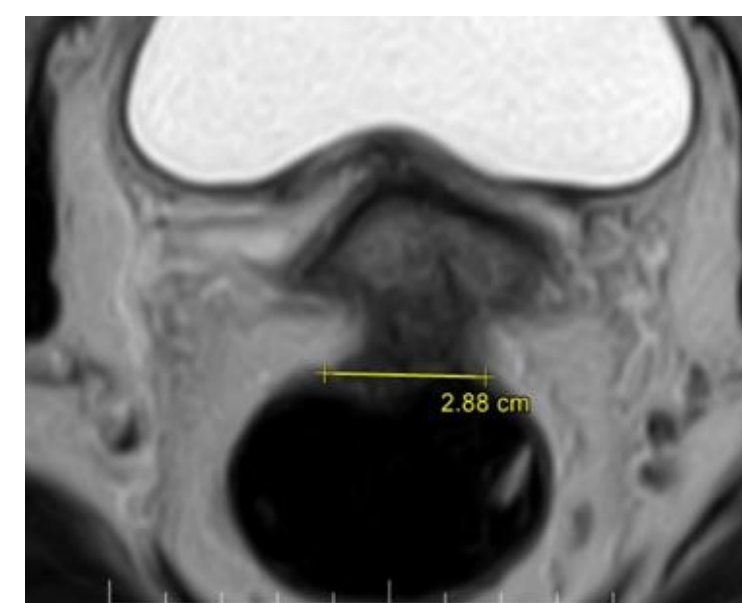


Figure 4 .T2WI coronal .There is indistinct plane with the rectum with mucosal extension (Mushroom sign) about 2.8 cm about 14 cm from anal verge with obliteration of recto-vaginal space (rectal infiltration) .

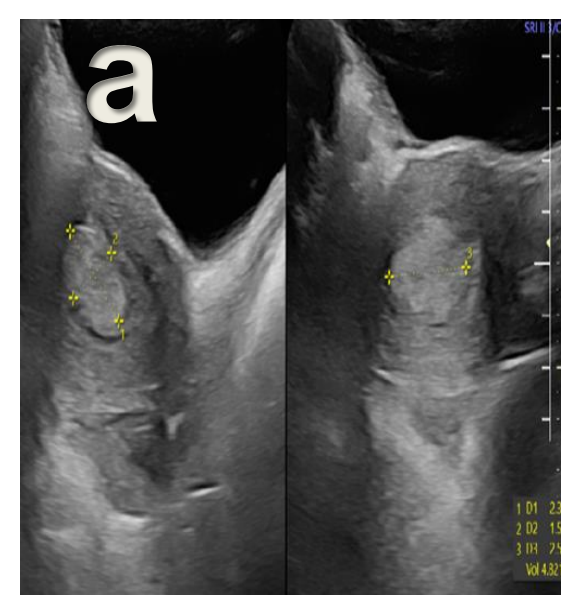
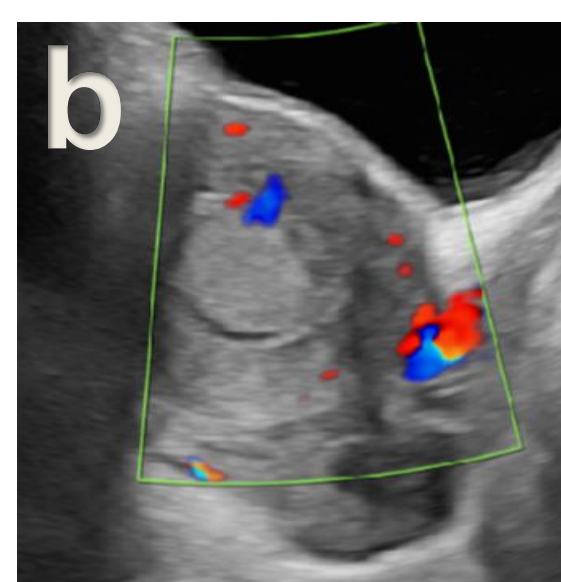


Figure 5 .a, b TAUS for female pelvis shows fundal polyp with single feeding vessel on color Doppler US.



c. pelvic MRI T2WI sagittal view shows increase endometrial thickness .b.T1 WI post contrast sagittal view shows endometrial enhancement .

