Reliability of 2D/3D transvaginal ultrasonographic (TVUS) features (MUSA) in diagnosing histological proven Adenomyosis using BCL6 biomarker in cases of reproductive failure

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Endometriosis and Adenomyosis are likely present in many infertile women. Laparoscopy was considered the gold standard for its diagnosis. However, TVUS has now become the first-line imaging tool for diagnosing adenomyosis, with MRI, which is a rather expensive technique, supporting a complementary role. Meanwhile the sensitivity and specificity of the different TVUS features has been assessed during perimenopausal rather than reproductive ages. The protein marker BCL6 has been found to be a reliable single diagnostic biomarker at the endometrium level for the detection of endometriosis. We looked at the sensitivity and specificity of different 2D and 3D TVUS features for the diagnosis of adenomyosis in cases of reproductive failure proven to have endometriosis at the level of uterus using BCL6 biomarker.

Patients and methods

We looked retrospectively for cases that were referred to a private fertility center for reproductive failure during the period of March - September 2021, as infertile or repeated implantation failure or repeated miscarriage. 137 Subjects had received 2D/3D TVUS and had received endometrial biopsies at the secretory phase of menstrual cycle during their diagnostic workup. The authors looked at the images retrospectively and recorded both 2D/3D ultrasonographic features. This was followed prospectively in view of the BCL6 results (above a cut-off HSCORE=1.4 is positive). Statistical analysis was carried out using SPSS version 23 software.

Results

The number of cases that had no 2D adenomyosis (MUSA) features were 25/ 137 (18.2%) of BCL6 positive cases. While if 3D features were added: only 9/137 (6.5%). The results were as follows: Asymmetry myometrial wall sensitivity 33.1% and specificity 68.2%.

ITEMS	Sensitivity %	Specificity%	PPV %	NPV %	MUSA Sen 2D %	MUSA Spec 2D %	MUSA Sens 3D %	MUSA Spec 3D %
Asymetry myometrial wall	33.1	68.2	62.5	38.9	57.2	71.9	59.2	53.4
Globular Uterus	34.6	74.4	68.1	41.8	55	80.2	—	—
Hypoechoic linear Striations	21.2	77.9	60.4	38.3	71.3	79.7	52.8	61.1
Heterogenous Myometrium	75.7	31.4	63.6	45	86	61.3	82.7	41.4
Myometrial cyst	49.3	59.5	66.3	42	72	62.7	58.2	54.3
Poor EMJ	20.6	85.7	70	40	58.6	71.5	87.8	56
Question Mark sign	12.4	92.9	73.9	39.7	75	92.3	—	—

Conclusion

TVUS combined with the protein marker BCL6 proved useful in diagnosing adenomysis. 2D imaging only missed 18% of adenomyotic cases (sensitivity of 72%), while adding 3D features reduced that to 6.5% (or sensitivity of 93.5%). This work is the first research to

test for adenomyosis using MUSA criteria in a clinical setting using cases of reproductive failure with proven endometriosis at the level of the uterus and using BCL6 biomarker as a first line test. The evaluation assessment figures are different from those previously published by MUSA for these features which were pooled out in perimenopausal women undergoing hysterectomy A drawback of this study is the retrospective analysis of the images. Ideally a prospective study is advised. In addition, while BCL6 as a biomarker has proven to have high sensitivity and specificity, it is not 100% accurate.