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T2 Shading Sign-On Magnetic Resonance Imaging In Bilateral Ovarian Endometriomas.

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A forty-year-old female presented with lower abdominal pain and dysmenorrhea for the past four to six months. She had menorrhagia in her previous two cycles. No history of dyspareunia was present. She did not have any vaginal discharge, fever, or weight loss. There was no past myomectomy or Cesarean delivery. Pelvic examination was unremarkable except for mild tenderness. Lab investigations were within normal limits.

Imaging Findings

A transvaginal ultrasound was performed which revealed well-defined cystic lesions with few internal echoes in the bilateral adnexa. An eccentric, hypoechoic nodule with no vascularity was present within the left adnexal cyst. Uterus and endometrium appeared normal. Magnetic resonance imaging (MRI) of the pelvis showed a normal-sized, retroverted uterus. Her Cervix was normal. The right ovary showed a loculated, cystic lesion which was T1 hyperintense with T2 hypointensity, suggestive of T2 shading sign representing endometrioma (Figures 1-3). The left ovary showed a similar cystic lesion with a T2 hypointense, eccentric nodule representing a 'T2 dark spot'. A T2 hypointense fluid level was seen in one of the left ovarian follicles (Figure 3).

DISCUSSION

Endometriosis is the presence of ectopic endometrial glands outside the uterus. Ten percent of women of reproductive age may have this condition. [1] Atypical location and presentation can be a diagnostic difficulty and thus imaging is useful before treatment. The most common sites of involvement by endometriosis are the ovaries, uterine ligaments, pelvic cul-de-sac, pelvic peritoneum, fallopian tubes, rectosigmoid colon, and bladder. Spread to more distant sites is possible and iatrogenic spread can also occur during surgery or needle biopsy. [2,3,4]

A transvaginal ultrasound should be the first-line imaging examination when endometriosis is suspected. This is very helpful and has accuracy comparable to transrectal ultrasound for diagnosing intestinal lesions and it provides superior results than MRI for the assessment of deeply infiltrating endometrial implants in other locations, particularly small lesions of the uterosacral ligament and urinary bladder. [2] High specificity is associated with an adnexal mass with hyperintensity on T1-weighted MR images and hypointensity on T2-weighted images called 'T2 shading' on MRI. This degree of signal change is much greater than that of hemorrhagic cysts. T1-weighted fat-suppressed images must be included in the imaging protocol for endometriomas. Diffusion restriction can be present, thus making it difficult to differentiate it from other conditions like benign hemorrhagic ovarian cysts and benign mature cystic teratomas which also show restricted diffusion. [1] The T2 dark spot sign on MRI has been described to have high specificity for chronic hemorrhage and is a useful sign to differentiate endometriomas from hemorrhagic cysts. According to this study, T2 dark spots were defined as well-defined, discrete, markedly hypointense foci within an adnexal lesion on T2-weighted images. [3]

Several treatment options, hormonal and non-hormonal are available to provide symptomatic relief and to control the disease progression. However, the final diagnosis of endometriosis requires surgery and histopathological diagnosis. [5]

Final diagnosis

Bilateral ovarian endometriomas.

Differential diagnosis

Hemorrhagic ovarian cyst, Mature cystic teratoma, Tubo-ovarian abscess

Figure captions and origin
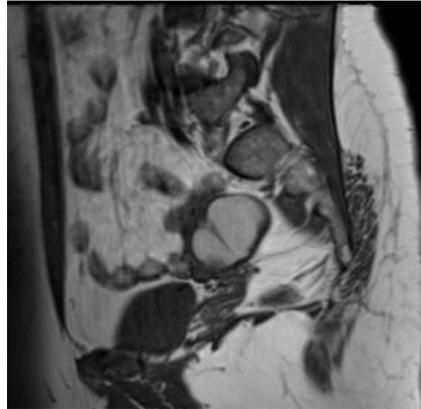
Fig 1. Sagittal T1-weighted image shows a well-defined, hyperintense, cystic lesion in the right ovary measuring ~ 4x2.8x3.4 cm.
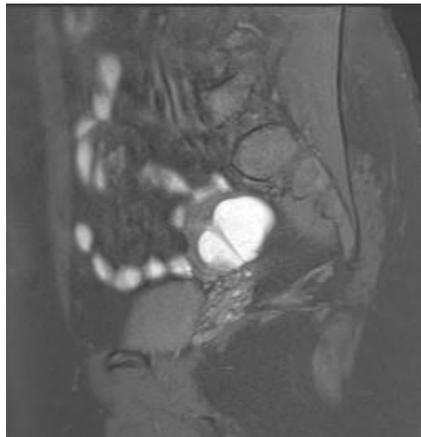
Fig 2. Sagittal T1-weighted fat-suppressed image shows the same findings.
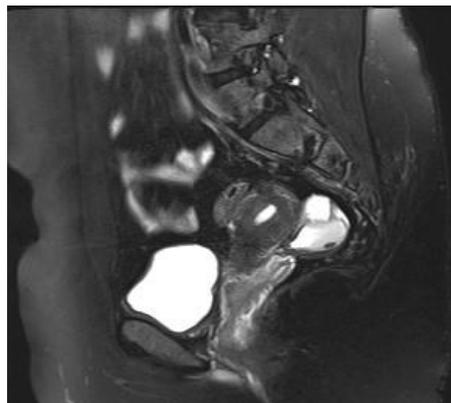
Fig 3. Sagittal T2-weighted fat-suppressed image shows a well-defined cystic lesion measuring ~ 3.2x3x2.2 cm in the left ovary. A T2 hypointense nodule is seen within it, representing a 'T2 dark spot'. The T1 hyperintense lesion appears as T2 hypointense, thus representing 'T2 shading'. Uterus appears normal in size and mildly retroverted.
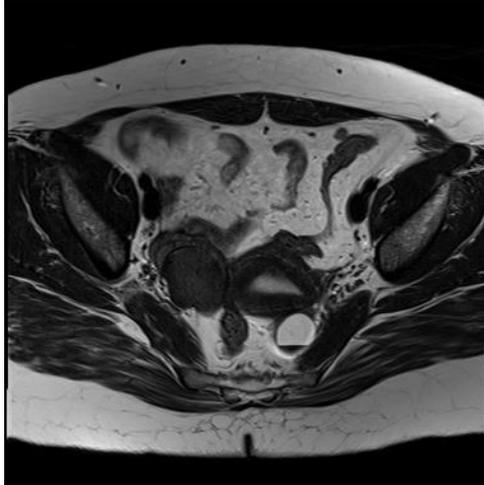
Fig 4. Axial plane T2-weighted image shows the hypointense right ovarian lesion and a hemorrhagic fluid level in one of the left ovarian follicles.
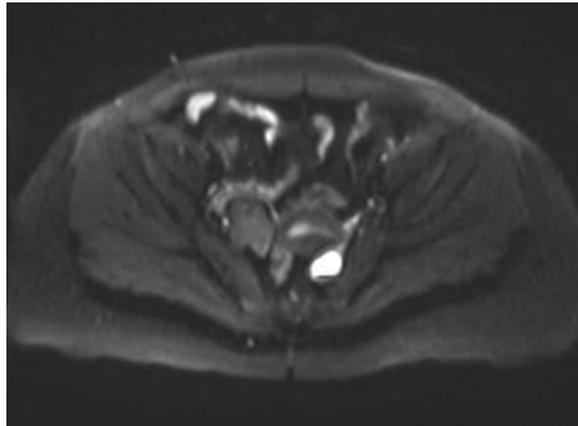
Fig 5. Axial diffusion-weighted image shows patchy, mildly increased diffusivity within the right ovarian lesion. (Obtained at b values of 50 and 800 sec/mm2) However, it is hypointense compared to the left ovarian follicle.
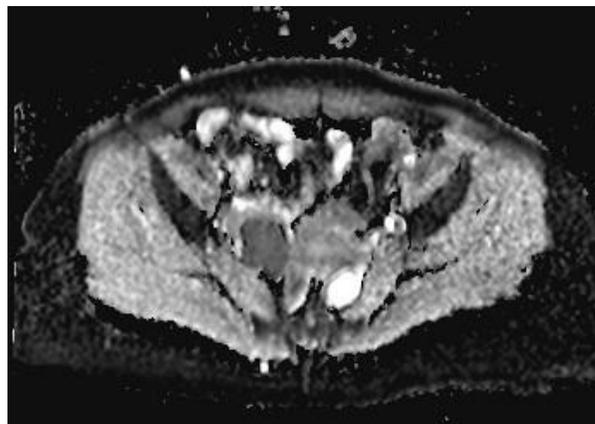
Fig 6. Corresponding Apparent diffusion coefficient (ADC) images show hypointensity in the right ovarian lesion, suggestive of diffusion restriction.

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