



ORIGINAL RESEARCH PAPER

Radiodiagnosis

ROLE OF MRI IN GYNECOLOGICAL EMERGENCIES

KEY WORDS: MRI, cyst, fibroid, gynecological, emergencies, torsion,

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ABSTRACT

AIM: The aim of this study was to assess the emerging role of magnetic resonance imaging in the gynaecological emergencies.

MATERIALS AND METHODS: Methods: Twenty nine non pregnant female patients with acute pelvic pain or bleeding per vagina who underwent MRI pelvis at our imaging department between November 2019 and August 2020 were reviewed. The final diagnosis was established by surgical findings in 16 cases, & biopsy in 1 respectively. The remaining 11 cases underwent follow-up MRI.

Results: MRI was diagnostic in 28 (95.5%) out of 29 patients and non-diagnostic in 1 case. The commonest gynaecological emergency was ovarian cyst with complications. Imaging findings in 16 (55.2%) patients were correlated with surgery. The overall sensitivity and PPV of MRI in acute gynaecological conditions was 95.6% and 98.2%.

INTRODUCTION

Patients presenting with Acute pelvic pain related to the gynaecological tract is a common in the emergency department. Although USG helps in initial diagnostic evaluation of the gynecological emergencies presenting in emergency department, still ultrasound is inconclusive in few settings such as hemorrhage, origin of lesion, complex uterine anomalies etc. Magnetic resonance (MR) imaging thus gives more detailed information about pelvic lesions, which narrows the differential diagnosis of acute gynecological diseases. Also MR imaging assist with the diagnosis of haemorrhage by showing signal intensity changes within the lesions. Rare gynecologic conditions are often difficult to diagnose; however, comprehensive image interpretation by MRI can lead to an accurate diagnosis. But the imaging findings should always interpreted in association with the clinical context.

MATERIALS AND METHODS

This prospective study done in a period of ten months from November 2019 to August 2020. All non-pregnant female patients with acute gynaecological complaints who underwent MRI of the pelvis in our hospital were included. MRI machines (GE 1.5T optima) at our institute was used. All these patients had undergone ultrasound pelvis prior to the

MRI such that antenatal patients and ectopic pregnancies were excluded in this study. The following variables were analysed: presenting complaints, MR imaging findings and mode of management (conservative or surgical). In cases of surgical or interventional management, correlation with preoperative MR imaging diagnosis was done. Follow-up data of the surgically & non-surgically managed patients were also collected. The efficacy of MRI was assessed based on its sensitivity and positive predictive value. All statistical analyses were conducted using Predictive Analytics Software.

RESULTS

MRI findings of all our patients were correlated with surgical findings (n = 16), or and with clinical, biochemical or imaging follow-up (n = 13). MRI was diagnostic in 28 (95.5%) out of 29 patients and non-diagnostic in 1 case. MRI failed to correctly diagnose 1 case of Para ovarian cyst. The commonest gynaecological emergency was ovarian cyst with complications such as haemorrhage, rupture, torsion. Imaging findings in 16 (55.2%) patients were correlated with surgery. The overall sensitivity and PPV of MRI in acute gynaecological conditions was 95.6% and 98.2%. The mean age of the patients was 33 years with age range of 16 to 58 years.

Table 1. Gynecological emergencies done MRI with surgical correlation and Sensitivity, PPV of MRI .

Diagnosis	Number Of Patients Done MRI Study	Correct Diagnosis By MRI	Surgical Or Biopsy Correlation	Sensitivity Of MRI	PPV of MRI
Hemorrhagic Ovarian / Para ovarian cyst Peritoneal inclusion cyst/ OHSS/ ovarian cyst rupture /ovarian cyst torsion	8	7	4	87.50%	100%
Endometriotic cyst	4	4	2	100%	100%
PID / Tubo ovarian abscess	2	2	-	100%	100%
Fibroid with cyst degeneration, submucous /cervical fibroid Adenomyosis	8	8	8	100%	100%
Pelvic congestion syndrome	1	1	-	100%	100%
Imperforate Hymen/ HWW syndrome	3	3	-	100%	100%
ACUM	1	1	-	100%	100%
Uterine AVM	1	1	1	100%	100%
Ca cervix pyometra	1	1	1	100%	100%
TOTAL	29	28	16	95.56%	98.2%

DISCUSSION

MRI is valuable tool in diagnosing complex acute gynecological conditions by its superior multi-planar imaging capability, spatial & soft tissue resolution. MRI sequence- fat-suppressed T1-weighted sequence used to detect haemorrhage (Fig. 1a,) which is a common feature of

haemorrhagic cysts, endometriotic cyst and haemoperitoneum. Sagittal MR imaging may be used to detect tubular pathologies. MRI sequence- STIR detect ovarian oedema as smooth wall thickening of a twisted ovarian mass in torsion. Rare gynecological lesions such as Herlyn Werner Wunderlich Syndrome (Fig.5)in which

duplication of uterus, cervix, vagina and Unilateral Uterovaginal obstruction causing hematosalpinx ,hematometra , hematocolpos with Ipsilateral renal agenesis diagnosed with MRI while ultrasound is indeterminate. Complex uterine anomalies presenting in emergency department such as accessory and cavitated uterine mass (ACUM) is detected in MR imaging as well-defined thick-walled lesion, wall of lesion with same signal intensity as adjacent normal myometrium, central cystic component – T1/T2 hyperintense- consistent with blood degeneration products. Both cornua of uterus, bilateral ovaries and endometrial cavity normal. (Fig. 4). Diffuse and focal adenomyosis were better delineated in MRI as T1,T2 hyperintense tiny cystic glands. (Fig. 3). Location, type of fibroid (Fig. 2), with complications such as degeneration, demonstrated in MRI provides the road map for surgeon. Herlyn Werner Wunderlich Syndrome (Fig.5)in which duplication of uterus, cervix, vagina and Unilateral Uterovaginal obstruction causing hematosalpinx ,hematometra , hematocolpos with Ipsilateral renal agenesis. Thus, MRI facilitates in optimal management by early diagnosis of acute gynecological conditions which were indeterminate in ultrasound.

CONCLUSION

Although the initial modality of choice in gynaecological emergencies is USC, our study proves that MRI is an effective imaging tool in diagnosing acute gynaecological pathologies in emergent settings, especially in large institutions. Also MRI is superior to ultrasound in pelvic lesion characterization and is the problem solving modality when ultrasound is inconclusive .This facilitates early diagnosis, and optimal management.

REPRESENTATIVE CASES

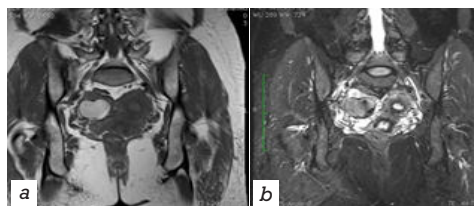


Figure1. T1coronal, T2stir Coronal MRI shows left ovarian endometriotic cyst with T2 Dark Spot

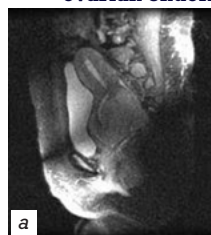


Figure 2. Sagittal T2WI MRI in a patient with posterior wall cervical fibroid.



Figure 3. Sagittal T2WI in a patient with adenomyosis, tiny hyperintense cysts within the myometrium representing a dilated endometrial gland.

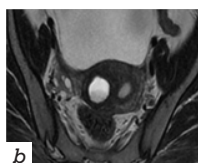
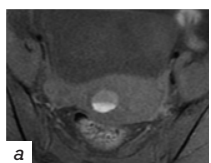


Figure 4. Axial T1(Aa),T2(b) shows thick walled lesion, of same signal intensity wall as myometrium, central cystic component – T1/T2 hyperintense- consistent with blood products.Both cornua of uterus, bilateral ovaries and endometrial cavity normal suggestive the diagnosis of accessory and cavitated uterine mass(ACUM).

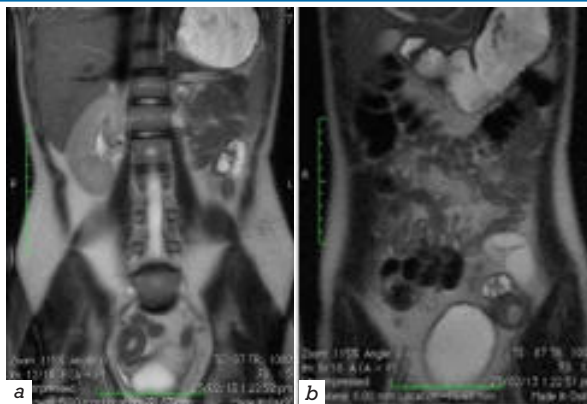


Figure 5. Coronal T2. shows duplication of uterus, cervix, vagina and Unilateral Uterovaginal obstruction causing left hemosalpinx with Ipsilateral renal agenesis in patient with Herlyn WernerWunderlich Syndrome

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