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RESEARCH ARTICLE

HISTOPATHOLOGICAL STUDY OF FEMALE PELVIC MASSES IN A TERTIARY CARE CENTRE OF CENTRAL INDIA: WITH MRI CORRELATION

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ABSTRACT

Introduction: Pelvic masses in females are a diagnostic challenge, given their proximity to a variety of pelvic structures and because of a long list of a broad differential diagnosis. Distinction between malignant, benign and inflammatory lesions is vital for patient's management. **Objective:** The objective of the study was to analyze pre- and postoperative findings of patients with pelvic masses and to predict the utility of Magnetic Resonance Imaging in diagnosis of pelvic masses. The histopathological findings were correlated with pre-operative USG & MRI findings Materials And **Methods:** The study was prospective and was carried out between March 2015 to August 2016 at the Department of Pathology and Radiology, N.S.C.B. Govt. Medical College, Jabalpur. Clinical, imaging & pathological correlation of 94 cases was done for diagnosing pelvic masses accurately. After surgery we analyzed histopathological (HP) findings of lesions as a mean of final diagnosis and staging **Results:** Out of 94 cases, majority of the patients were in the age group between 30 – 50 years. Predominant symptoms of the patients were abdominal pain, menorrhagia, abdominal distension and dysmenorrhea. Among the lesions studied, majority of lesions were uterine 54.2% while 41.5% were adnexal lesions. Cervical cases comprised approximately 29% of the total uterine cases. Leiomyomas (69.4 %) was the commonest pathology detected. Among the adnexal lesions, maximum lesions were ovarian (87.1%). The most common adnexal lesions seen in our study was serous cyst adenoma (42.11%) followed by mature cystic teratomas (26.32%). The diagnosis given on ultrasound & MRI was confirmed with histo-pathological findings. **Conclusion:** This study illustrates clinical and radiological examination are useful initial steps in work-up of pelvic lesions but histopathological studies plays an important role in assessing pelvic masses and in choosing the appropriate management.

INTRODUCTION

A pelvic mass is a swelling or an enlargement in the pelvic region, which may originate from either the gynecologic organs (the uterus, cervix, and uterine adnexa) or other pelvic organs (the bladder, intestines, ureters, and renal organs). Pelvic masses in females are a diagnostic challenge, given their proximity to a variety of pelvic structures and because of a long list of a broad differential diagnosis, including benign and malignant neoplasms and nonneoplastic diseases. After pelvic examination, imaging is often the primary indication for surgical assessment of a pelvic mass. Pathology reports are considered the reference standards for assessing the accuracy of imaging findings. Imaging plays an ever increasing role in the diagnosis of suspected gynecologic diseases. Ultrasonography is currently the imaging procedure of choice for assessing the female genital organs. But it too has its limitations. MRI is a multiplanar imaging modality which provides high resolution contrast images, great anatomic details and tissue characterization. MRI is increasingly used for the evaluation of pelvic pathologies including both congenital and acquired conditions affecting uterus, adnexa and adjacent organs. However when compared to ultrasound, MRI is expensive.

The purpose of the study was to analyze pre- and postoperative findings of patients with pelvic masses, to assess the pathological spectrum of pelvic masses and to determine the diagnostic efficacy of MRI in diagnosing pelvic masses.

MATERIALS AND METHODS

A hospital based prospective, Nonrandomized observational study was carried out at NSCB, Medical College, Jabalpur, Madhya Pradesh. The inclusion criteria was all female patients above 10 years attending the gynaecological services of a tertiary teaching hospital in Central India, during the study

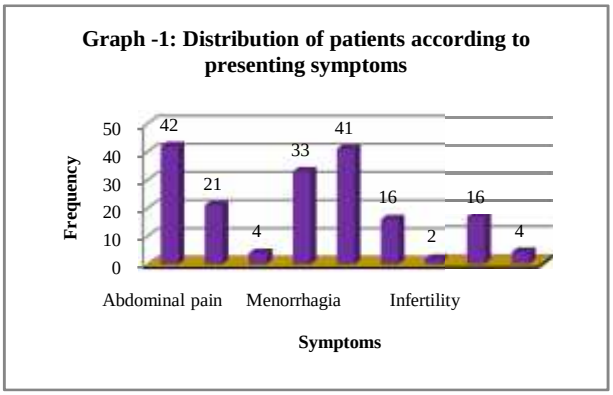
period between March 2015 to August 2016 with pelvic pathologies with inconclusive diagnosis on USG. Relevant clinical history and significant clinical findings of all the patients were collected in appropriate proforma. The study was approved by ethical committee of the college. Exclusion Criteria was patients of claustrophobia, or with metallic pacemakers, uncooperative patients, patients with psychiatric illnesses, morbidly ill patients, patients with recent history of surgery or trauma and patients with known pelvic malignancies on treatment. Data including age, parity, symptoms and pelvic sonography report and MRI report was collected for the study. The specimens were processed routinely and stained with Hematoxylin and eosin stain and examined microscopically. MRI was performed using a 1.5 Tesla MRI scanner machine named GE Sigma 1.5 T. Routine, spin echo, T1, T2 weighted and post Gadolinium contrast sequences were obtained in transverse and sagittal and coronal planes. T1 weighted fat suppression sequences were used depending on clinical suspicion. The data of the present study was analyzed with the help of SPSS 20 software for windows. Appropriate univariate and bivariate analysis and the descriptive statistics were carried out. The sensitivity and diagnostic accuracy was measured for comparison of two modalities of imaging i.e. MRI and Ultrasound when compared to histopathological diagnosis, which was taken as the gold standard in this study.

RESULTS

We identified 94 patients who met the inclusion criteria and underwent a pelvic MRI during the study period. Among the 94 cases studied the age group of the subjects ranged from 10 years to 75years and majority of the patients were in the age group between 30 - 50 years. The predominant symptoms of the patients were abdominal pain (42 cases) and abdominal distension due to pelvic mass (41 cases).

Table -1 Distribution of cases according to age group

Age group (in yrs)	Number of patients	Percentage
<20	8	8.5
21-30	15	15.9
31-40	30	31.9
41-50	31	32.9
51-60	5	5.3
>60	5	5.3
Total	94	100



Among the 94 cases studied, majority of lesions were uterine (54.2%) and approximately 41.5% were adnexal lesions. In the current study, 38.3% were affecting the body of uterus and 15.9% were affecting the cervix. Cervical cases comprised approximately 29% of the total uterine cases. Majority of the uterine lesions studied were benign, of which, Leiomyomas (69.4 %) was the commonest pathology detected followed by adenomyosis which constitute 13.9 % of the uterine lesions. Among the 25 diagnosed cases of leiomyoma on MRI, 18 underwent surgery.

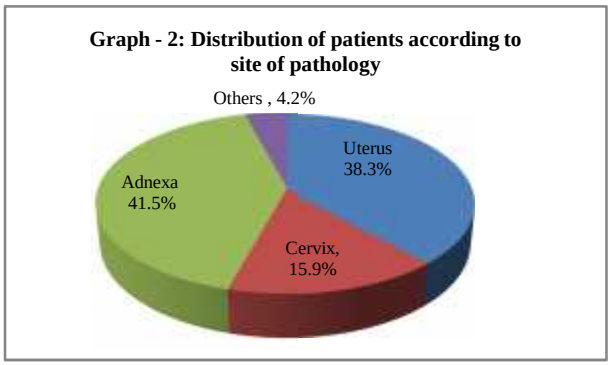


Table 4 Distribution of patients according to pathological conditions affecting the uterus

Uterine lesions	Number of cases	Percentage
Leiomyoma	25	69.4%
Adenomyosis	5	13.9%
Bulky uterus	2	5.5%
Endometrial mass	1	2.8%
Mullerian anomaly	3	8.3%
Total Number of cases	36	100%

Table 5 Distribution of patients according to the pathological conditions affecting the adnexa

Adnexal lesions	Number of cases	Percentage
Ovarian lesions	34	87.1%
Tubo ovarian abscess	1	2.6%
Ectopic pregnancy	1	2.6%
Broad ligament leiomyoma	3	7.7%
Total number of adnexal lesions	39	100%

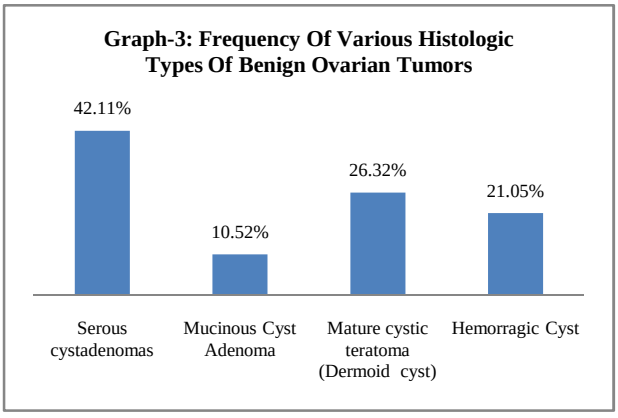


Figure 1 Gross photograph of mature cystic teratoma showing hair tufts with thick yellowish, pasty material.

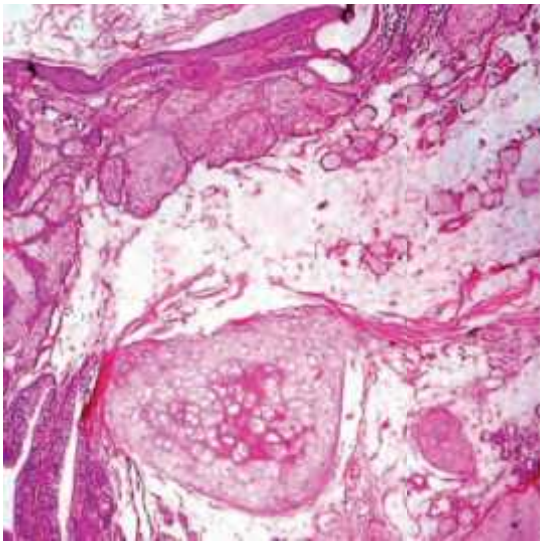
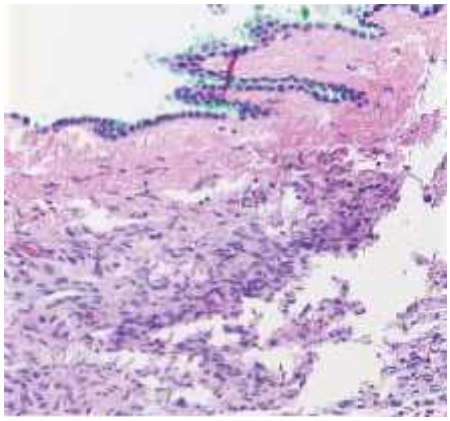


Figure 2 Photmicrograph of mature cystic teratoma showing squamous epithelium, sebaceous glands, cartilage and mucous glands (H and E, ×40)

a



b

Figure 3 a Gross photograph of serous cystadenoma **b** Section showing ovarian tissue lined by cuboidal epithelium (H&E,x10).

On grossing, 11 Leiomyomas were located intramural, 4 were subserosal and 3 were submucosally situated. Size of the leiomyomas varied from0.5cm to 14cm. Among the adnexal lesions studied, maximum lesions were ovarian, which constitute 87.1% of the total cases. The other adnexal lesions studied include tubo ovarian abscess, ectopic pregnancy, and broad ligament leiomyoma. Out of the thirty -four ovarian lesions, twenty-five cases were surgically managed whereas nine cases were followed conservatively. The benign neoplasm's of ovarian were more common than malignant. The frequency of different histopathological types of benign ovarian tumor showed that the commonest tumor was serous cyst adenoma (42.11%) followed by mature cystic teratoma (26.32%) (Graph-3) Among histopathologic types of malignant ovarian tumors, the commonest category encountered in our series was malignant epithelial tumors followed by germ cell tumours. Majority of the ovarian lesions were cystic in nature, comprising 56.7% of the cases, while Solid cystic comprised 26.7% of the cases. Ovarian neoplastic lesions with predominantly solid component constituted 16.7% of the total ovarian cases.

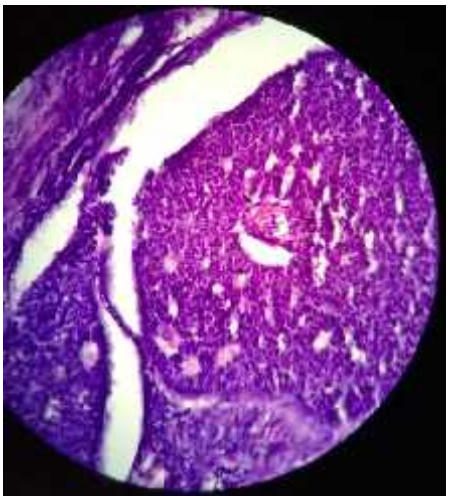


Figure 4 Section showing Adult Granulosa cell tumour(H&E x40)

Among the 94 cases studied 31 cases (32.9%) were managed conservatively and 63 (67%) cases underwent surgical management. Ultrasound findings were correlating with the surgical pathological findings in 53 patients. Of the 63 cases operated, 60 cases showed positive correlation between MRI and histopathological diagnosis.

Considering the postoperative and histopathological findings as the gold standard, the sensitivity of USG findings was found to be 84.13% with a 95% confidence interval 72.74% to 92.12%. Similarly the sensitivity of MRI was observed considerably better than USG which is 95.24, with a 95% confidence interval of 86.71 to 99.01%. Thus indicating a strong level of agreement compared with the number of agreements expected by chance

DISCUSSION

Pelvic masses in female patients have a broad differential diagnosis, including benign and malignant neoplasms and non-neoplastic diseases. Many pelvic masses are a diagnostic challenge. The differentiation of benign from malignant masses is of great therapeutic significance. Hence, the pre-operative detection of the nature of pelvic mass becomes extremely important for appropriate management. Ultrasound is often the first-line imaging modality for the evaluation of pelvic masses, especially in women, in whom the ovaries are a potential source. However, ultrasound has its limitations. The use of pelvic MRI has been shown to decrease the misclassification of a lesion as benign or malignant, confirming complex adnexal masses to be ovarian in origin. This information before surgery can assist with appropriate referral, surgical and treatment planning, and patient counselling regarding expectations as well as the risks and benefits of the procedure. [1]

In the present study of 94 patients, who had suspected uterine and adnexal lesions, were evaluated by USG and MRI and the results were correlated with histopathological diagnosis. Among the cases studied the age group of the subjects ranged from 10 years to 75years and majority of the patients were in the age group between 30 – 50 years. Prior studies by Kadam *et al* [2] and Aruna kumara *et al* [3] had majority of cases in the age group of 31-40 years and 21-40 years respectively. In the present study, the most common presenting complaints of patients were lower abdominal pain in 45 cases and lump in the lower abdomen in 44 cases. Similar findings were seen by Guzel Al *et al* [4] where the initial compliant was abdominal pain in 77.5% cases, vaginal bleeding in 20% of the patients and 12.5% of their patients were asymptomatic.In the study by Al-Shukri *et al* [5] the presenting symptom was of lower abdominal pain in 98% cases.

Out of the uterine lesions, Leiomyomas were the commonest pathology observed (69.4%). Most common age group of women with Leiomyomas were above the age of 35 years. Uterine fibroids (i.e. myomas or leiomyomas), benign tumors of the uterus, are the most common pelvic tumors in women. [6] According to a study conducted by Zaloudek C. Hendrickson *et al*, 40% of women older than 35 years had uterine fibroids. [7] Prior study have also observed most commonly encountered pelvic pathology (14%) as leiomyoma. [2] Most of the leiomyomas were intramural in location. The Subserosal fibroids appeared as an adnexal lesion on USG while MRI was helpful in revealing the pedunculated origin of subserosal leiomyoma from the myometrium. MRI was accurate in the diagnosis and localization of uterine leiomyoma. Among the 25 diagnosed cases of leiomyoma on MRI, 18 underwent surgery and the post operative histopathological diagnosis was similar to the MRI findings. There were 3 cases of broad ligament leiomyoma also. Larger leiomyomas showed degenerative changes on histopathology.

The next most common uterine pathology that was found was adenomyosis. The lesion was common in multiparous women aged above 35 years. Among the 6 cases of adenomyosis diagnosed on MRI, 2 were given as bulky uterus on USG. Diagnosis of adenomyosis on clinical findings alone is usually difficult. Imaging plays an important role in the evaluation of myometrial lesions and the common diagnostic modalities available in the outpatient clinic by ultrasonography. Though MRI is helpful in diagnosing adenomyosis, women have a limited access to it ,as it is not available in most of the medical centres and even if it is the cost factor limits its utility .Histopathology confirmed the diagnosis and MRI was effective in diagnosis adenomyosis and also differentiating adenomyosis from leiomyoma. Fast breath-hold T2-weighted MRI might be useful to improve performance in measuring the junctional zone to diagnose uterine adenomyosis. [8]

In the present study, out of the 15 cases (15.9%) of cervical pathology maximum cases were of squamous cell carcinoma of cervix, one case of endocervical mass was histopathologically proved to be adenocarcinoma of endocervix and only one case of cervical polyp showed benign features . A study by Hricak H, Lacey CG, Sandles CG , *et al* found out that MR imaging is valuable because it can accurately demonstrate tumor location, tumor size, degree of stromal penetration, and lower uterine segment involvement as well as for ruling out parametrial, pelvic sidewall, bladder, and rectal involvement. [9]

Among the adnexal lesions studied, maximum lesions were ovarian, which constitute 87.1% of the total cases. The preponderance of ovarian lesions in adnexnal masses in our study was also similar to Khan S [10] and Bhagde AD *et al*. [11] The benign neoplasm's of ovarian were more common than malignant. The frequency of different histopathological types of benign ovarian tumor showed that the commonest tumor was serous cyst adenoma (42.11%) followed by mature cystic teratoma (26.32%) (Graph-6). The preponderance of benign tumors in our study was also similar to Pilli *et al*. [12]and Gupta *et al*. [13]

Among the cases studied the most common germ cell tumor was mature cystic teratoma, (26.32%). Most of the cases of mature cystic teratoma were found in women of age group less than 30 years and one of the case was found in women of age 40 years. Several studies reported that the proportion of mature cystic teratomas was decreased in with the advancement in age. [12, 14]. Among histopathologic types of malignant ovarian tumours, the commonest category encountered in our series was malignant epithelial tumours followed by germ cell tumours. Similar observation has been reported by Gupta *et al* [13] and Bhattacharya *et al*. [15]

There were 6 cases of functional cysts diagnosed on MRI, which were managed conservatively. An important goal of the analysis of pelvic masses is an attempt to identify non-neoplastic entities from neoplastic lesions. In order to have appropriate patient triage, referral, and management, a correct preoperative diagnosis of pelvic masses is very important.

Our study is not without limitations. First, this was a study with a small sample size ,our analysis was performed only for patients with pelvic pathology who subsequently received a pelvic MRI; thus we do not include patients who presented with problematic masses on initial imaging or physical examination and proceeded directly to surgical management. Second, as this study was performed at a tertiary care institution, the generalizability of these results may not be applicable if such detailed MRI capacity is not available. Third, this cohort only included those who had surgery and a repeat review of the nonsurgical patients should be done and they should be kept in close follow-up.

CONCLUSION

Our study highlights the wide variety of pelvic lesions in our set-up. MRI should be considered for the evaluation of pelvic lesions when sonographic findings are not able to provide conclusive diagnosis, or to determine the origin of tumour. Though clinical and radiological examination are useful initial steps in work-up of pelvic lesions but histopathological studies play a major role by which we can assess the staging and grading of the lesion which will be greatly helpful in the management of the disease thereby reducing the morbidity and burden associated with it.

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