



## Ovarian Neoplasms-Evaluation by Magnetic Resonance Imaging (MRI)

Authors

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### Abstract

*The present study focuses upon the role of MRI in evaluation of ovarian neoplasm and to compare with clinical, surgical and histopathological data.*

### Objective

To evaluate the accuracy of MRI in diagnosis and characterization of ovarian neoplasm into benign and malignant, primarily evaluated by ultrasonography (USG).

### Materials and Methods

The present study was conducted in the Department of Radio diagnosis, Bankura Sammilani Medical College, Bankura in a time span of 1 year from March 2017 to March 2018. A total of 53 patients with lesions of ovarian origin were taken for the study, prior evaluated by ultrasound (HD7 Philips). These patients were referred to us from Department of Gynecology and Obstetrics, Department of General Medicine and Department of General Surgery. All patients in our study underwent pelvic MRI imaging on a 1.5 Tesla scanner (GE). Scanning was performed after a fasting period of 4-6 hours, in supine position with a surface coil placed on the torso covering the entire imaging area. T1, T2, T2 fat saturation, Diffusion restriction (DWI), ADC mapping and POST CONTRAST (Gadolinium

dimeglumine was used) images were taken in axial, coronal and sagittal planes. Post processing was done by inbuilt processor.

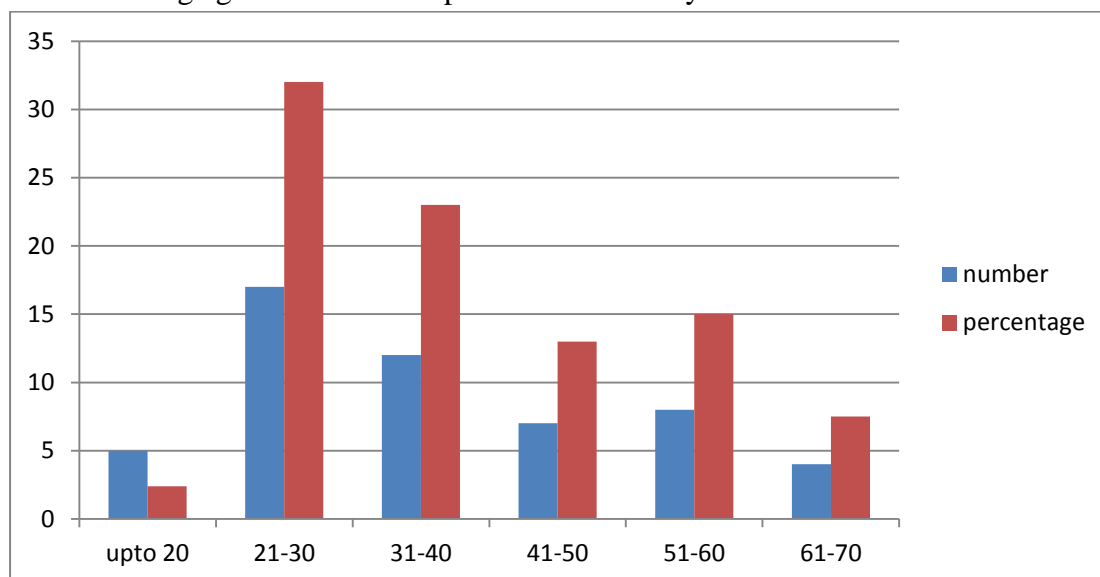
Descriptive statistical analysis has been carried out in the present study. Significance is assessed at 5% level of significance. Chi square test/Fisher Exact test has been used to find the significance of association of MRI with Histopathological diagnosis/ follow up/ other tests.

The statistical software namely SPSS15.0, STATA 8.0, MedCalc 9.0.1 and Systat 11.0 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc

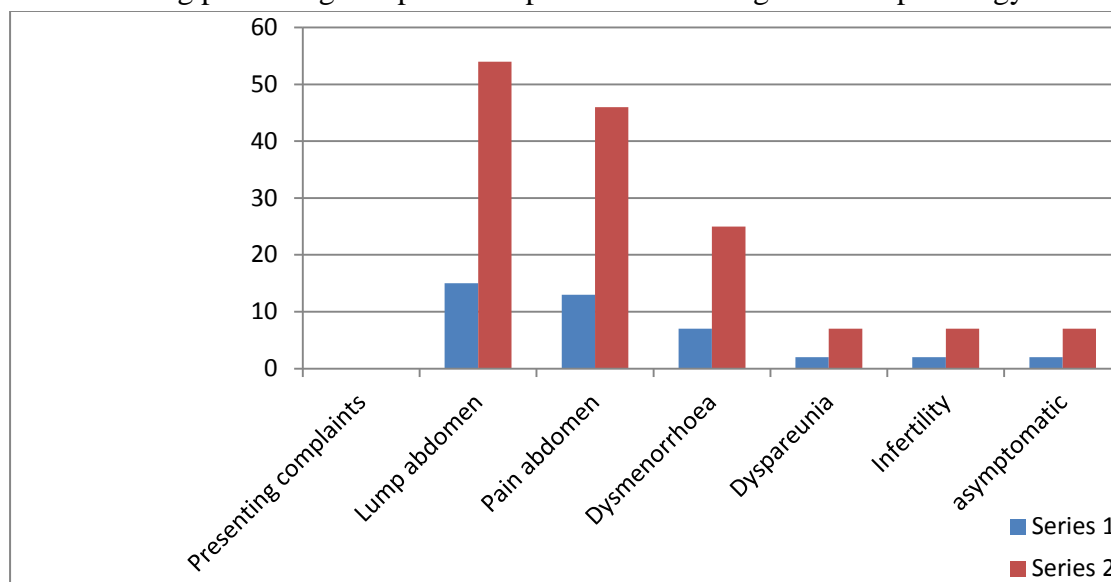
### Results and Observations

A total of 53 patients with lesions of the ovarian origin (benign, borderline, and malignant) were taken for the purpose of study. This includes 3 patients of PCOD.

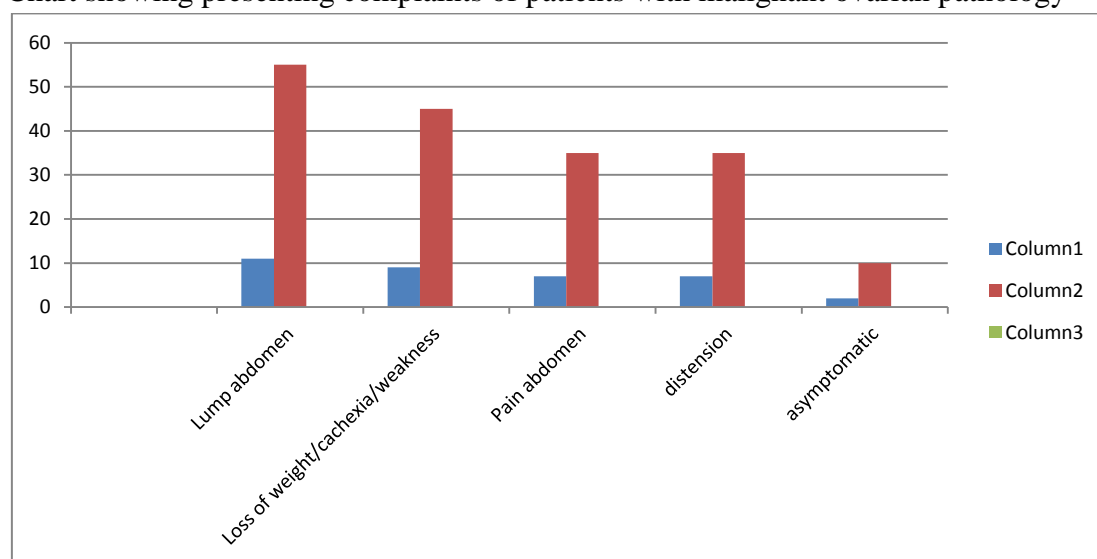
1. Chart showing age distribution of patients in the study.



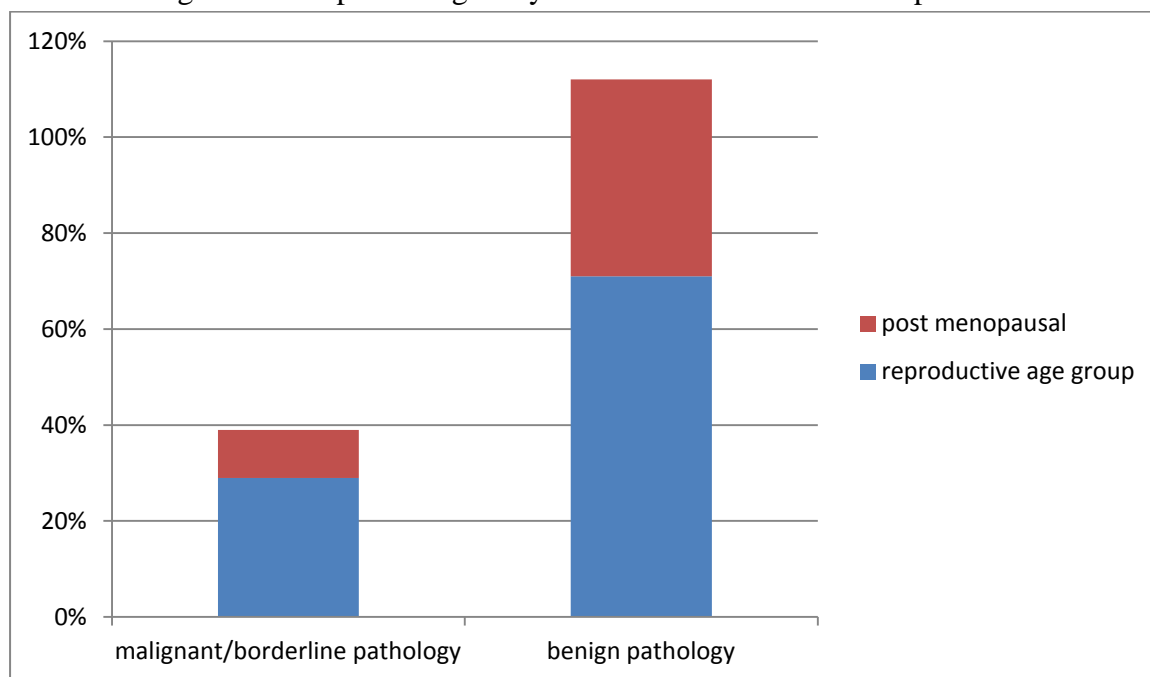
2. Chart showing presenting complaints of patients with benign ovarian pathology



3. Chart showing presenting complaints of patients with malignant ovarian pathology



4. Chart showing relationship of malignancy with menstrual status of the patient



5. Sensitivity, Specificity and accuracy of MRI in differentiating benign from borderline and malignant lesions

There were 72 lesions in 50 patients. MRI diagnosed 50 benign lesions, 3 borderline and 19 malignant lesions. Final diagnosis was established by pathological analysis of all the lesions those were operated. Small simple, haemorrhagic and endometriotic cysts were diagnosed with

pathological analysis, follow up imaging or comparison with prior USG. the cases in which the histopathological diagnosis revealed parovarian cystadenoma was omitted from these calculations. Distribution of lesions-

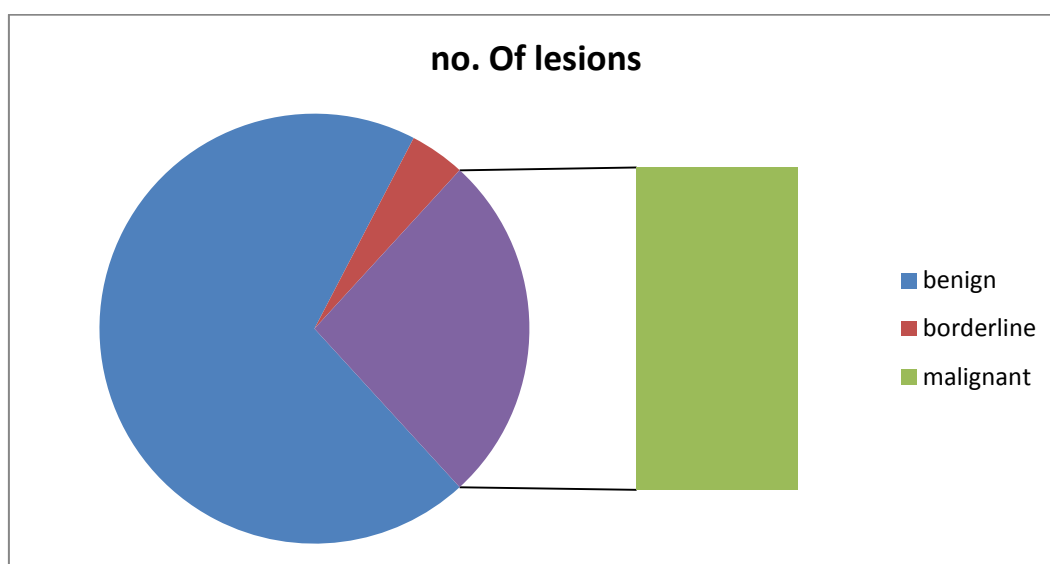
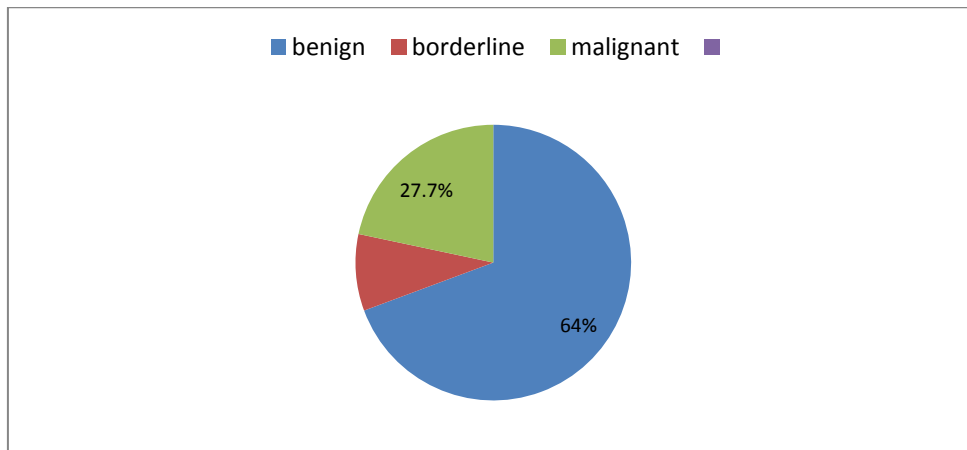


Table showing distribution of lesions according to benign, borderline, and malignant (Histopathological diagnosis)

type	benign	borderline	malignant	Total
No. Of lesions	46	6	20	72
percentage	64%	8.3%	27%	100%



DATA ANALYSED	Hp benign	Hp malignant	Total
MRI benign	45(63%)	9(13%)	54(75%)
MRI borderline/malignant	1(1%)	17(24%)	18(25%)
	46(64%)	26(36%)	72(100%)

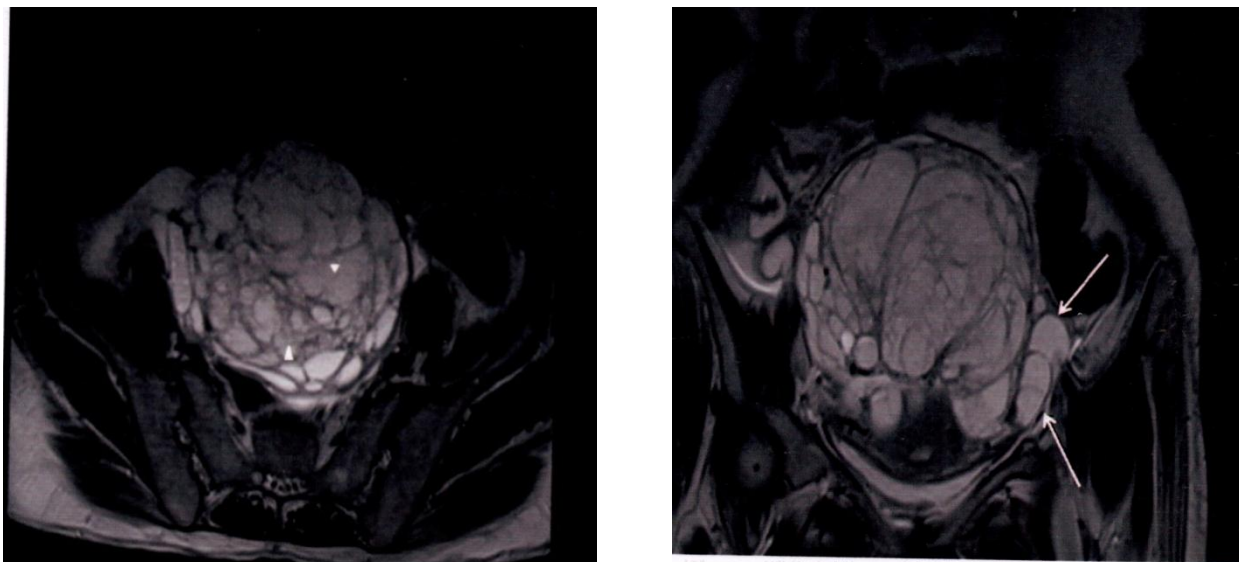
	value	95% confidence interval
Sensitivity	97.8	88.4-99.9
Specificity	65.3	44.3-82.7
Positive predictive value	83.3	70.7-92.0
Negative predictive value	94.4	72.7-99.8
P value	<0.0001	
Likelihood ratio	2.82	
Balanced accuracy of MRI in differentiating benign/borderline/malignant	81.6%	

Specific imaging features of benign and malignant masses on MRI

Imaging features	Malignant/borderline (total-26)	Percentage (%)	Benign (total-32)	Percentage (%)
Size>=4cm	26	100	31	97% <sup>11</sup>
Solid component	17	65%	1	3%
Solid component with necrosis	13	50%	0	0%
Papillary projections	11	42%	0	0%
Thick wall/septa(>3mm)	11	42%	7	22%



T2 weighted axial image showing multiloculated thin walled cystic lesion with thin septae. Features of benign ovarian neoplasm.



T2 weighted axial and coronal images showing multiloculaed biadnexal cystic lesions, with honeycomb loculi, thin walls, and septa along with multiple papillary projections. Ascites is present. Features of borderline/ malignant ovarian neoplasm.

Bar diagram showing relation of specific imaging features of benign and malignant nature of masses

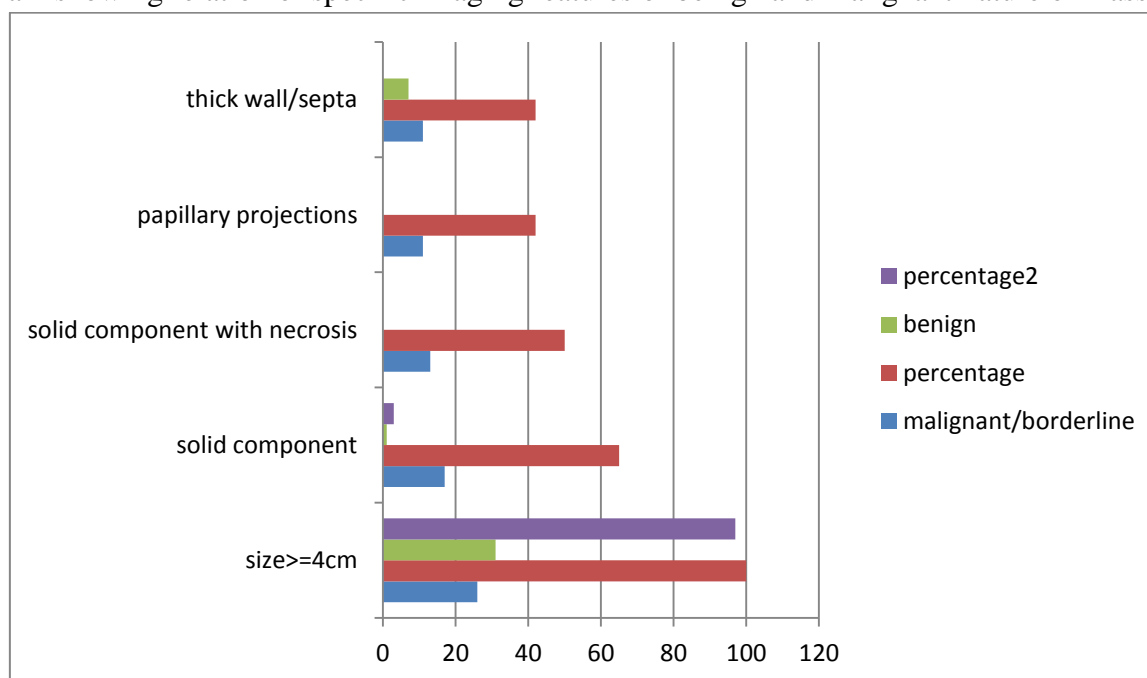
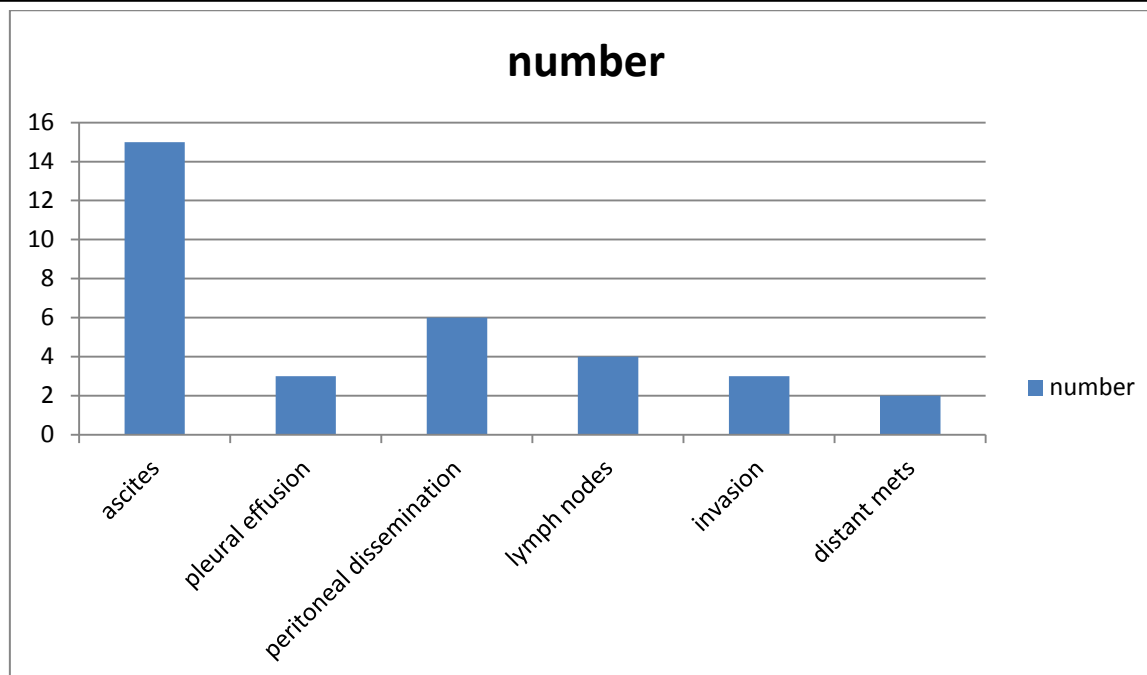


Table showing the distribution of dissemination of the malignant neoplastic lesions in the study

Ascites	15	100%
Pleural effusion	3	20%
Peritoneal dissemination	6	40%
Lymph nodes	4	27%
Invasion	3	20%
Distant metastasis	2	13%
Total number of cases	15	



### Discussion

The present series of study consisted of 53 patients who presented with various gynaecological complaints for ultrasound to the Department of Radiodiagnosis, Bankura Sammilani Medical College and Hospital.

The most common age group in which we found ovarian masses was 21-30 years (32%), followed by 31-40 years. The commonest presenting complaint in both benign and malignant ovarian masses was feeling of lump in the abdomen, followed by pain abdomen in benign cases and systemic symptoms of weight loss, generalised weakness and cachexia in malignant cases. Malignant cases were predominantly seen in older age group (61-70 years).

Post processing, we found 81.6% accuracy, 97.8% sensitivity, 65.3% specificity of MRI in differentiating benign from malignant lesions. The larger confidence interval in specificity, however, indicates less precise estimate due to small sample size.

### Summary and Conclusion

The study was a prospective observational study conducted in Department of Radio diagnosis, Bankura Medical College and Hospital, Bankura, during a period of 1 year.

The following conclusions were drawn-

MRI is sensitive and accurate in distinguishing between benign, borderline and malignant lesions. Features indicative of malignancy include presence of both solid and cystic areas within a lesion, necrotic component, thick wall, thick septae, papillary projections, ascites, implants (peritoneal, mental and/or mesenteric) or lymphadenopathy.

In conclusion, it can be said that due to excellent depiction of pelvic anatomy and absence of ionising radiations, MRI is an excellent tool for the assessment of disorders of the ovary in women of child bearing age and post menopausal status

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