

Original Research Article

Histopathological evaluation of ovarian tumours in southern part of Assam

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ABSTRACT

Background: Ovarian malignancy is the second most common cancer of the female reproductive system and the leading cause of death from gynecologic malignancy. With increase in longevity, the incidence of epithelial ovarian cancer is increasing and its etiopathology remains unknown. A female's risk at birth of having ovarian tumour sometime in her life is 6-7%. Two third of ovarian tumours occur in women of reproductive age group. The aim was to study the distribution of morphological pattern of benign, malignant, and nonneoplastic lesions of the ovary in different age groups and to determine the likelihood of bilateral involvement in different morphologic subtypes.

Methods: A retrospective study from January 2018 to December 2020 was undertaken. A total of 210 surgical specimens were obtained. Detailed clinical information and radiological findings were recorded from the case sheets. Grossing of the surgical specimens was done in the pathology department, followed by histological examination.

Results: Of 210 cases, benign cases were 140 (66.7%), malignant cases were 70 (33.3%). Surface epithelial tumors were most common (116/55.2%) followed by germ cell tumors (76, 36.1%) followed by others. Serous cystadenoma was commonest benign tumor (58, 41.4%). Serous adenocarcinoma was commonest malignant tumor (19, 27.1%). Benign tumours were more common in the younger age group i.e. <40 years of age whereas malignant tumours were supervenes with increase in age. Most benign ovarian tumors (54, 38.6%) were seen between 31-40 years whereas most malignant tumors (24, 34.3%) were seen above 40 years. In 1st two decades, germ cell tumors were more common than other tumours.

Conclusions: The prognosis and varying therapeutic strategies of ovarian tumours necessitate an accurate pathological evaluation. Histopathological study is still the gold standard in diagnosing most of these tumours.

Keywords: Germ cell tumour, Ovarian neoplasms, Serous cystadenoma

INTRODUCTION

The clinical and biological behaviour of ovarian malignant tumours varies. It is the sixth most prevalent cancer among women (6.6/100,000 age-standardized incidence rate) and the world's seventh leading cause of cancer deaths (4.0/100,000 age-standardized mortality rate). In India, the proportion of ovarian cancer ranged from 1.7 percent to 8.7 percent of all female cancers in different cases during the period 2018-2019.¹ It is rare to have ovarian lesions in the early stage because their

complex morphology and association with symptoms that are relatively mild. Within and between histologic subtypes, ovarian cancer has substantial heterogeneity. Ovarian tumours are not an unusual neoplasm in women. Ovarian tumour histology displays a broad variety of variation.²

This study was conducted with the aim to find out the frequency of different histologic types of ovarian tumours reported from Department of Pathology of Silchar

Medical College, Silchar and to analyse age distribution and bilaterality of these tumours.

Women between the ages of 65 and 84 were found to have two to three times higher prevalence rates of ovarian cancer compared to younger women. A significant issue with ovarian tumours is that they only give vague signs and symptoms initially. These tumours are infamous for their large scale, but are mostly associated with symptoms that are relatively mild. Ovarian cancer risk factors are not well specified. There is, however, general consensus on two risk factors: nullparity and the family history. A greater prevalence of ovarian carcinoma is seen in single and low-parity married women.³

The aim of the study was to see the distribution of morphological pattern of benign, malignant, and non-neoplastic lesions of the ovary in different age groups and to determine the likelihood of bilateral involvement in different morphologic subtypes.

METHODS

A retrospective study of a total of 210 cases of lesions of the ovary was conducted in the Department of Pathology, Silchar Medical College and Hospital, over a period of 2 years from January 2018 to December 2020. Detailed clinical information and radiologic findings were recorded from the case sheets. These included age and sex of them patients, signs and symptoms, fine-needle aspiration cytology findings of the available cases, complete blood count, ultrasonography/computed tomography findings, and biochemical investigations. In our study, all ovarian specimens were obtained from total abdominal hysterectomy specimens with unilateral or bilateral adnexa, oophorectomy, and cystectomy specimens received in the department. The specimens were analyzed macroscopically for various parameters such as external surface and cut surface with contents of the cyst. Tissues were processed by formalin-fixed paraffin-embedded techniques and sections stained with hematoxylin and eosin stain (H and E) and examined microscopically.

Inclusion criteria

All clinically diagnosed and histopathologically confirmed cases were included in the present study.

Exclusion criteria:

The non-neoplastic lesions were not included.

Samples were collected using stratified random sampling technique. All the data were analysed using Microsoft excel 2013 and figures were drawn using Microsoft word 2013.

The study was approved by the Institutional Ethics Committee.

RESULTS

From January 2018 to December 2020, specimens from 210 cases with ovarian tumours were processed in our laboratory.

Out of 210 ovarian tumours included, 66.7% (140/210) were benign and (70/33.3%) were malignant. Surface epithelial tumours were most common (55.2%), followed by germ cell tumours (36.1%).

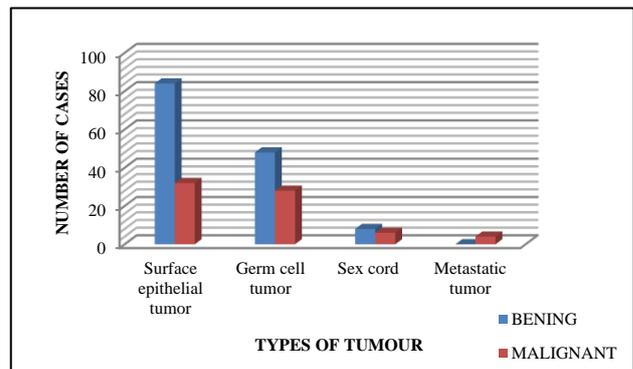


Figure 1: Frequency of different classes of benign and malignant ovarian tumors.

The above Figure 1 shows different classes of benign and malignant ovarian tumours. Surface epithelial tumours consist of 84 benign cases and 32 malignant cases with a total of 55.2%. Germ cell tumour showed 48 cases of benign cases 28 malignant cases with a percentage of 36.1%. Sex cord cell tumour consists of 8 cases of benign and 6 cases of malignant with a percentage of 6.7%. Lastly 4 cases of malignant metastatic cases with a percentage of 1.9%.

Out of each type of ovarian tumour again the types of tumour under each types were seen in both benign and the malignant ones and the bilaterality were seen among the tumours.

Among the benign tumours which were found in the present study were serous cystadenoma, mucinous cystadenoma, mature cystic teratoma; whereas in the malignant counterpart that were found in the study were serous cystadenocarcinoma, mucinous cystadenocarcinoma, malignant Brenner tumour, immature teratoma, malignant mixed tumour, yolk sac tumour, granulosa cell tumour, fibrosarcoma and metastatic tumour.

Distribution and bilaterality of the tumours were seen which were given below in the following Figure 2.

In Figure 2 the types of benign ovarian tumour were seen, their distribution and bilaterality. Out of 140 cases of benign ovarian tumour, 60 cases were serous cystadenoma with 2 cases of bilaterality, 24 cases of mucinous cystadenoma with 3 cases of bilaterality and

lastly 56 cases of mature cystic teratoma all of them were unilateral.

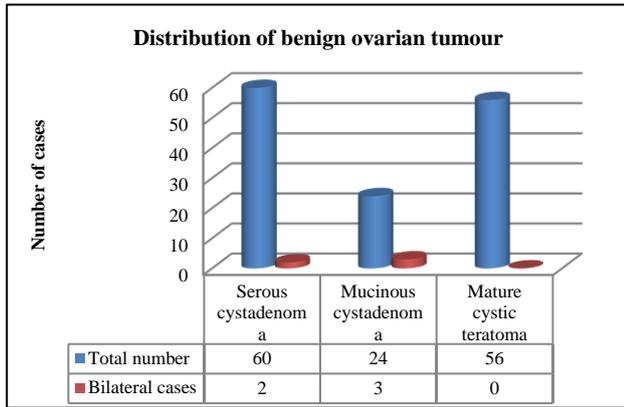


Figure 2: Distribution and bilaterality of benign ovarian tumour.

Table 1: Distribution and bilaterality of malignant ovarian tumour.

Histopathology	Total number	Bilateral cases
Serous cystadenocarcinoma	19	6
Mucinous cystadenocarcinoma	9	4
Malignant Brenner tumour	2	0
Immature teratoma	18	5
Malignant mixed tumour	2	0
Yolk sac tumour	10	0
Granulosa cell tumour	4	0
Fibrosarcoma	2	0
Metastatic tumour	4	2
Total	70	17

In Table 1 the distribution and bilaterality of different malignant ovarian tumours were seen.

Out of 70 cases of malignant ovarian tumour 19 cases were of serous cystadenocarcinoma, 9 cases of mucinous cystadenocarcinoma, 2 cases of malignant Brenner tumour and 2 cases of malignant mixed tumour out of the epithelial tumour.

Out of the germ cell tumour 18 cases showed immature teratoma, 10 cases showed yolk sac tumour.

Out of the sex cord cell tumour 4 cases showed granulosa cell tumour, and 2 cases showed fibrosarcoma.

There are 4 cases of metastasis.

Also in the Table 3 and Figure 3 the bilaterality were also shown, where there are 6 cases of serous cystadenocarcinoma, 4 cases of mucinous

cystadenocarcinoma, 5 cases of immature teratoma and 2 cases of metastasis, showing a total of 17 cases of bilaterality.

The age group distribution was seen among the 210 cases of ovarian tumour.

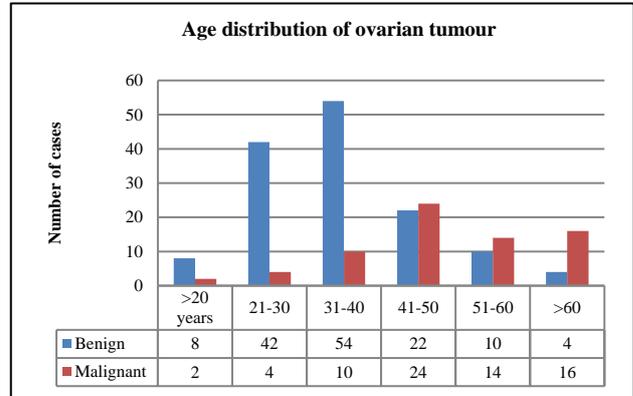


Figure 3: Frequency of benign and malignant ovarian tumours in different age groups for all age groups, benign tumours were more common than malignant tumours.

In the Figure 3 age distribution of the ovarian tumours that were found in the present study was seen.

Out of 210 cases according to the age wise distribution >20 years were 8 benign cases and 2 malignant cases, in the age group of 21-30 cases 42 cases were benign and 4 cases were malignant, in 31-40 years of age 54 cases were benign and 10 cases were malignant, 41-50 years of age 22 cases were benign and 24 cases were malignant, 51-60 years of age 10 cases were benign and 14 cases were malignant cases and lastly >60 years of age 4 cases were benign and 16 cases were malignant cases.

It has been seen that benign cases were more in early age group of people having ovarian tumour then malignant cases which were more in the older age group, thus indicating that the chances of malignancy increase with the increase in age.

The histological variants of both benign and malignant tumours of the epithelial, germ cell, sex cord tumours and metastatic tumours were seen according to the age group.

The following Table shows the various distributions of the tumours according to the age group.

In the Table 2 age wise distribution of the individual tumours in the benign category were seen, where most of the cases were seen in the age group of 31-40 years with 54 numbers of cases and most of them were serous cystadenoma.

Table 2: Individual benign tumours according to the age group.

Diagnosis	Age groups in year						Total
	Upto 20	21-30	31-40	41-50	51-60	>60	
Serous cystadenoma	2	18	21	11	6	2	60
Mucinous cystadenoma	1	5	13	3	1	1	24
Mature cystic teratoma	5	19	20	6	3	1	54
Fibroma	0	0	0	2	0	0	2
Total	8	42	54	22	10	4	140

Table 3: Individual malignant tumours according to the age group.

Diagnosis	Age groups in year						Total
	Upto 20	21-30	31-40	41-50	51-60	>60	
Serous cystadenocarcinoma	2	0	0	11	3	3	19
Mucinous cystadenocarcinoma	0	0	0	6	2	1	9
Malignant Brenner tumour	0	0	0	2	0	0	2
Immature teratoma	0	0	7	3	4	4	18
Malignant mixed tumour	0	0	0	0	2	0	2
Granulosa cell tumour	0	0	2	0	0	2	4
Yolk sac tumour	0	4	2	2	0	2	10
Fibrosarcoma	0	0	0	0	2	0	2
Metastatic	0	0	0	0	0	4	4
Total	2	4	10	24	14	16	70

8 number of cases up to age group 20 years where most number of cases were of mature cystic teratoma, 42 number of cases in the age group of 21-30 years where most number of cases were of serous cystadenoma, mature cystic teratoma and 6 cases were of mucinous cystadenoma. In the age group of 31-40 years 20 cases were of mature cystic teratoma, 18 cases were of serous cystadenoma, 16 cases were of mucinous cystadenoma with total of 54 cases, 22 cases in the age group of 41-50 years with 12 cases consisting of serous cystadenoma, 4 cases each of mucinous cystadenoma and mature cystic teratoma and 2 cases of fibroma. 10 cases were in the age group of 51-60 years, with 6 cases in serous cystadenoma and 2 cases each in mucinous cystadenoma and mature cystic teratoma. 4 cases in the age group of >60 years, 2 each in serous cystadenoma and mucinous cystadenoma.

Likewise the individual malignant tumours were seen according to the age group in the Table 3.

In the above Table 3 age wise distribution of the individual tumours in the malignant category were seen, where most of the cases were seen in the age group of 41-50 years with 24 numbers of cases and most of them were serous cystadenoma.

2 number of cases up to age group 20 years where both the cases were in immature cystic teratoma, 4 cases in the age group of 21-30 years where all the cases were in yolk sac tumour. In the age group of 31-40 years a total of 10 cases where 6 cases were in immature cystic teratoma, 2 cases in granulosa cell tumour and 2 cases were in yolk

sac tumour. 24 cases in the age group of 41-50 years with 8 cases consisting of serous cystadenocarcinoma, 10 cases in mucinous, 2 cases in yolk sac tumour.

14 cases were in the age group of 51-60 years, with 2 cases in serous cystadenocarcinoma and 4 cases in mucinous cystadenocarcinoma, 4 cases in immature teratoma, 2 cases each in malignant mixed tumour and fibrosarcoma. 16 cases in the age group of >60 years, 4 cases in mucinous cystadenocarcinoma, 2 cases in immature teratoma, 4 cases in malignant mixed tumour, 2 cases in granulosa cell tumour, and lastly 4 cases comprising of metastasis.

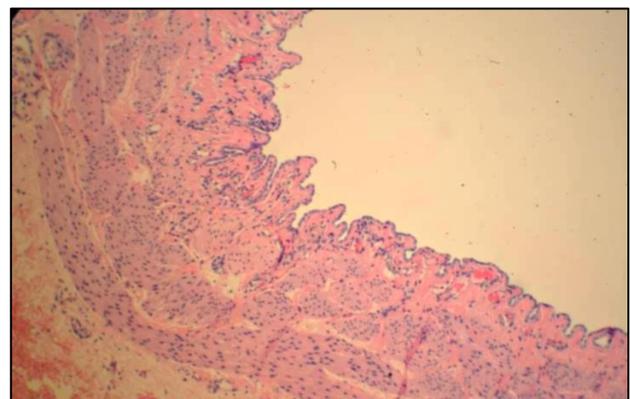


Figure 4: Serous cystadenoma (10X, H and E).

Photomicrograph in Figure 4 shows cyst lined by cuboidal epithelium with dark coloured lining.

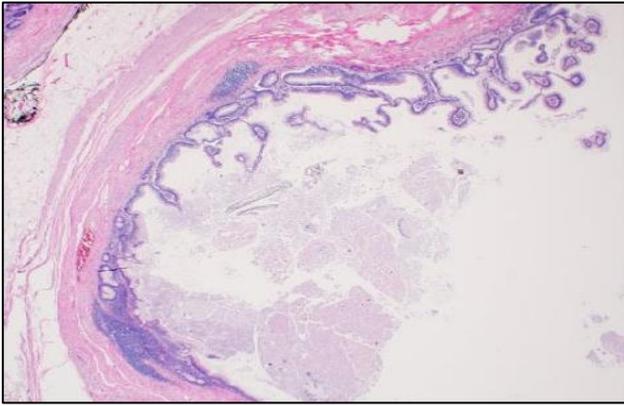


Figure 5: Mucinous cystadenoma (10X, H and E).

Photomicrograph in Figure 5 shows tall columnar non-ciliated epithelium with clear cytoplasm of the lining and basally located nuclei.

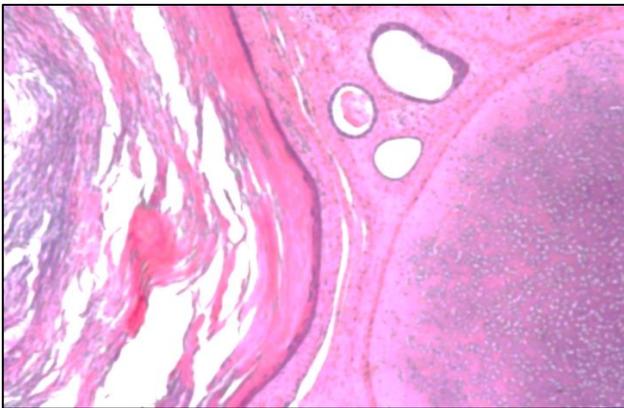


Figure 6: Mature teratoma (10X, H and E).

Photomicrograph Figure 6 shows mature teratoma with well differentiated cartilage in the right lower half and keratinized squamous epithelium in the left half.

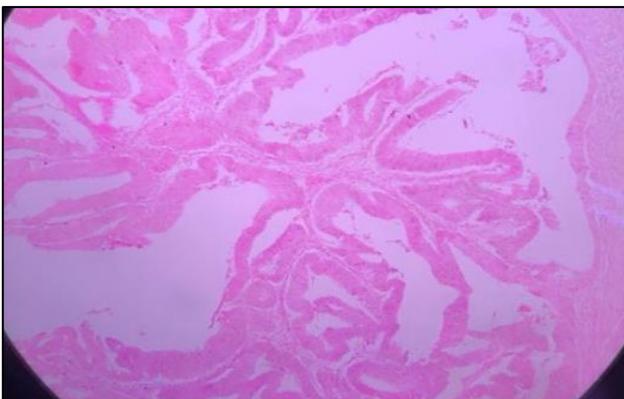


Figure 7: Mucinous cystadenocarcinoma.

Photomicrograph of Figure 7 shows disorder arrangement of cysts and glands of irregular shape with clear cytoplasm and non-ciliated tall coloumnar epithelium.

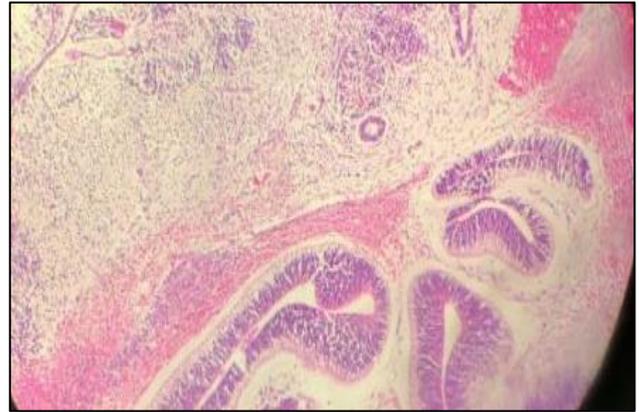


Figure 8: Immature teratoma.

Photomicrograph of Figure 8 shows immature neural component lining the ovary with scant cytoplasm and hyperchromatic nuclei showing immature teratoma.

DISCUSSION

In this study, 210 cases of ovarian tumour the distribution of the tumours were seen according to the nature, hisological types and according to the age group. In our study out of 210 cases 66.7% ovarian tumours were benign and 33.3% were malignant. This is similar to the data by Karthik et al had approximately similar results which showed that 78.57% ovarian tumours were benign, and 20% were malignant.⁴

In the current study including both the benign and malignant tumours, surface epithelial tumours accounts for 55.2%, germ cell tumour accounts to 36.1%, sex cord cell tumour 6.7%, and metastatic tumour accounts for 1.9% of all ovarian tumours. Similar study was done by Gupta et al in which surface epithelial tumours were the commonest (48.8%) followed by germ cell tumours (23.9%), sex cord stromal tumours (8.3%) and metastatic tumours (2.0%).⁵ Likewise study done by Ahmad et al surface epithelial-stromal tumours (63.50%) cases, germ cell tumours (27. 13%) cases, sex cord-stromal tumours (5.84%) cases almost proportionate to the percentage in our study.⁶

Bilaterality of different histological subtypes of ovarian tumour is seen which is found to be 10.4% which is similar to the study done by Sharma et al which had a bilaterality of 8.86%.⁷

In the current study the individual tumour the number of bilateral cases are 2 cases of serous cystadenoma, 3 cases of mucinous cystadenoma out of the benign ones, and out of the malignant ones the individual tumour showing bilaterality are serous cystadenocarcinoma having 5 cases, mucinous cystadenocarcinoma showing 6 cases, 4 cases of malignant Brenner tumour, and 2 cases of metastatic tumours.

The age group distribution was also seen in the current study. Most of the cases falls in the age group of 31-40 years i.e. 64 cases consisting of 53.3% with 22 cases benign and 24 malignant cases. Similar study was done by Hawaldar et al where they showed that maximum studies were in the age group of 31-40 years with a 33.6% in this age group.⁸

For all age groups, benign tumours were more common than malignant ones.

In the present study most of the benign tumours were seen <40 years of age (104/120 i.e. 86.0%) whereas in age group more than 40 years of age the benign tumour decreases in number (36/90 i.e. 40%) and it was consistent with the study done by Malli et al which showed 86.0% of the tumour that is benign in nature falls below 40 years of age group whereas only 72.09% of all tumours occurring above 40 years was benign.⁹ Thus it can be seen that in lower age group benign tumours were more common than malignant tumours which increase with age.

In the current study when individual benign and malignant tumours were seen according to the age group it was seen that in the benign part serous cystadenoma forms the bulk of the benign ovarian tumour with 60 number of cases followed by mature cystic teratoma with 54 number of cases, mucinous cystadenoma with 24 number of cases lastly by fibroma with 2 cases. Similar study was done by Gupta et al where serous cystadenoma was the highest in benign ovarian tumour with 40 number of cases followed by mucinous cystadenoma and teratoma consistent with our study.¹⁰

In the present study the serous cyst adenoma was highest in the age group of 31-40 years of age with 21 number of cases, mucinous cystadenoma highest in the age group of 31-40 years of age with 13 number of cases, mature cystic teratoma highest in the age group of 31-40 years followed by 21-30 years of age with 20 and 19 number of cases respectively, lastly fibroma with 2 number of cases in the age group of 41-50 years of age. Similar study was also done by Krishna et al where they showed where they showed serous cystadenoma was the major benign tumour with 59 number of cases with majority in the age group of 40-49 years of age followed by 30-39 years of age with 19 and 17 number of cases respectively.¹¹

Also the malignant individual tumours were studied according to the age group where in the present study we can find that serous cystadenocarcinoma was highest consisting of 19 number of cases followed by immature teratoma with 18 number of cases, mucinous cystadenocarcinoma with 9 number of cases, malignant Brenner tumour 2, malignant mixed tumour 2, granulosa cell tumour 4, yolk sac tumour 10, fibrosarcoma 2 and metastasis 4 in number. Similar study was done by Mondal et al where they obtained highest number of

serous cystadenocarcinoma followed by mucinous carcinoma followed by immature teratoma and the rest, thus showing consistency with the present study.¹²

Thus from the current study we can observe that peak incidence of ovarian tumour is between 21-40 years.¹³ Benign ovarian tumours occur in all age group whereas malignant ovarian tumours are more common in elderly.¹⁴ Majority of benign serous tumours occur in 4th-6th decade although they may occur in patients younger than 20 or older than 80 years.¹⁵

The limitation of this study is that it was a hospital based study with small sample size. To validate our findings, further research with bigger sample size is needed.

CONCLUSION

This study describes the distribution, and pathological details of ovarian tumours in a tertiary care hospital in Southern part of Assam. Following WHO classification, epithelial and germ cell tumours were the predominant type of ovarian tumours in our study. Benign epithelial tumour formed the majority with 40.1% (84/210) cases with benign serous cystadenoma being the most common. Mature cystic teratoma was the main type of germ cell tumour. Almost one-third of the ovarian tumours were malignant with most common being serous carcinoma. More than half of the bilateral cases were malignant. Moreover benign cases are more common in the younger age whereas the incidence of malignant cases increases with age with worse prognosis. The prognosis and varying therapeutic strategies of ovarian tumours necessitate an accurate pathological evaluation.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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