BIOCELL
2019 43(3): 175-181

Tech Science Press

Histopathological patterns of ovarian lesions: A study of 161 cases

Abdulkareem Younis SULEIMAN[1]; Intisar Salim PITY[2]; Mohammed R MOHAMMED[2]; Bashar Abduljabar HASSAWI[2]

[1] College of Medicine, University of Mosul, Mosul, Iraq
[2] College of Medicine, University of Duhok, Duhok, Iraq

Key words: Histopathology, Immunohistochemistry, Ovarian lesions

Abstract: Ovarian lesions are commonly encountered pathologies that cannot be categorized clinicoradiologically. Definite diagnosis is of great importance for therapeutic and prognostic purposes. Histopathology gives accurate diagnosis in most cases. Few cases need supportive tests like immunohistochemistry. Objective: to study the histomorphological diversity of ovarian lesions, their age and location in North of Iraq (Mosul and Duhok). Patients and methods: In the period extended from January 2008 to December 2011, 161 cases of ovarian lesions were collected from pathology departments in Azadi General Hospital "Duhok" and Al-Jamhori Teaching Hospital "Mosul". Automated tissue processor was used for histologic study and Streptavidin-biotin method on paraffin sections was applied for immunohistochemistry. Result: There was a wide age range, most being in the third decade. The right ovaries were more common involved than the left. Histologically, 58 (36%) cases were non-neoplastic and 103 were neoplastic including 90 (55.9%) benign and 9 (5.6%) malignant tumors. The remaining 4 (2.4%) cases comprised borderline serous cystadenoma. Conclusion: Most ovarian lesions were functional non-neoplastic followed by benign neoplastic. Apart from few cases, diagnosis was merely histological without any ancillary test.

Introduction

Ovarian lesions form a frequent cause of hospitalization among females with different ages. Although most cases are physiological with no need for therapy, considerable number come as complicated cases and require surgical intervention. On the other hand, many ovarian lesions comprise neoplastic conditions, benign, borderline or malignant that may be life threatening if not urgently diagnosed and dealt with. Their great diversity possesses a great challenge for both surgeons and pathologists (Valentin *et al*., 2006; Koonings *et al*., 1989). Definite diagnosis is pathological rather than clinical or radiological. Histologic categorization is of great importance as the treatment differ depending on the nature of the lesion. The WHO classification (2002) of ovarian tumors, on the basis of tissue origin, acquired a universal acceptance (Fatima *et al*., 2017; Kant *et al*., 2017).

Material and Methods

Patients

In the period extended from January 2008 to December 2011, 161 cases of ovarian lesions were collected from pathology departments of Azadi General Hospital-Duhok and Al-Jamhori Teaching Hospital-Mosul. Automated tissue processor was used, and slides were stained by hematoxylin and eosin (HE). Tumors were classified according to the WHO classification, 2002 (Fatima *et al*., 2017; Kant *et al*., 2017). The few morphologically undiagnosed cases, immunohistochemistry (IHC) was applied using Streptavidin-biotin method on paraffin sections on poly-l-lysine-coated slides. Monoclonal or polyclonal mouse or rabbit primary antibodies (depending on the target antigen), manufactured by DAKO Corporation (Dako Denmark A/S), were added to confirm the diagnosis of granulosa cell tumor (CD99, Inhibin alpha, vimentin, calretinin) and to differentiate primary from metastatic adenocarcinoma (CK7, CK20, CDX2, WT, CA125, Estrogen receptors). Cases were analyzed using statistical analysis (IBM SPSS v. 22.00 for Windows) and $p < 0.05$ was considered statistically significant.

Results

The age range was 11-81 years with a mean age of 32 years, ovarian cysts were more commonly seen in the age group 20-29 years (Tab. 1).

*Address correspondence to: Abdulkareem Younis SULEIMAN, zaad28653@gmail.com

TABLE 1

Age distribution of ovarian cystic lesions (N = 161)

Age (years)	Functional Cyst	%	Neoplastic Cyst	Total Number	%
10-19	-		1	1	0.621118
20-29	30	58.8	15	45	27.95031
30-39	9	17.6	30	39	24.2236
40-49	7	13.7	18	25	15.52795
50-59	2	3.4	18	20	12.42236
60-69	2	3.9	15	17	10.55901
70-79	1	1.9	12	13	8.074534
≥ 80	-		1	1	0.621118
TOTAL	51		110	161	100

Most cases were demonstrated in the right ovaries 92 (57.1%). The left ovaries were involved in 60 (37.2%) cases. The remainders (N = 9; 5.5%) were Bilateral.

Histologically, functional cysts formed (32.8%) of cases followed by mature cystic teratoma (22.9%), then serous cystadenoma (19.8%). Malignant tumors were demonstrated in 9 cases, 8 primary, and 1 metastatic Krukenberg tumor (Tab. 2).

TABLE 2

Histopathological diagnosis of ovarian cystic lesions (161) cases

Lesion	Number (%)	Diagnosis	Number
Non-neoplastic	**58 (36%)**	**Corpus Luteal cyst**	**42**
		Follicular cyst	**11**
		Endometriosis	**5**
Neoplastic	**Benign 90 (55.9%)**	**Cystic teratoma** (Fig. 1(A))	**37**
		Serous cystadenoma Fig. 1(B))	**32**
		Mucinous cystadenoma (Fig. 2)	**14**
		Serous cystadenofibroma (Fig. 3)	**4**
		Fibroma/Thecoma (Fig. 4)	**2**
	4 (2.4%)	**Brunner tumor**	**1**
		Borderline serous cystadenoma (Fig. 5)	**4**
	Malignant 9 (5.6%)	**Serous cystadenocarcinoma** (Figs. 6-8)	**4**
		Mucinous cystadenocarcinoma (Fig. 9)	**3**
		Granulosa cell tumor (Fig. 10)	**1**
		Metastasis (Fig. 11)	**1**

Right ovaries were involved in ninety-two cases (57.1%), and left ovaries were affected in sixty cases (37.2%). The remaining nine cases (5.5%) were Bilateral, (Tab. 3).

TABLE 3

Literally distribution frequency of ovarian cyst (161 cases)

Side	No.	%
Left	60	37.26%
Right	92	57.1%
Bilateral	9	5.5%
Total	161	100%

Surface epithelial tumors (38.5%) formed the commonest neoplastic lesions, followed by germ cell tumors (22.9%) (Tab. 4); all were mature cystic teratomas. Metastasis to the ovary was detected in a single case; it was Krukenberg tumor from the lower gastrointestinal tract, proved by immunohistochemistry (CK20 positive, CDX2 positive, CK7 negative, WT negative, CA125 negative, ER negative).

We reported 3 cases of sex-cord stromal tumors which included 2 cases of fibrothecoma and a single case of granulosa cell tumor.

TABLE 4

Types of ovarian cystic tumors, according to WHO classification of (103) cases

Types	Number (%)		Number
Surface epithelial tumor	62 (60.2)	Benign	51
		Borderline malignancy	4
		Malignant	7
Germ cell tumor	37 (35.9)	Mature cystic teratoma	37
Sex cord stromal tumor	3 (2.9)	Fibroma/Thecoma,	2
		Granulosa cell tumor	1
Metastasis	1 (0.9)	Krukenberg tumor	1

Discussion

In this study, the third decade was the dominant affected age which is comparable with what has been reported by Fatima *et al.* (2017) The right ovary was the commonest side involved (57.1%). Such observation was in agreement with other studies from Saudi Arabia and Qatar (Zahra, 2016; Abduljabbar *et al*., 2015).

Histologically, benign ovarian lesions functional cysts (non-neoplastic) and benign cystic tumors formed the dominant morphology (87.3%) whereas malignancy was identified in (5.6%) of cases. A similar finding was reported (Jha and Karki, 2008). However, in a study done by Ahmad *et al.* (2000) (the prevalence of benign tumors was lower (59.2%) and malignancy was higher (40%).

The most common histopathological diagnosis of ovarian cysts in the present study was functional (follicular/ corpus luteal) cysts (32.88%), a finding which is in agreement with other studies done in Iraq, Saudi Arabia, Pakistan, Iran (Abduljabbar *et al*., 2015; Arab *et al*., 2010; Rasha, 2007; Ahmad *et al*., 2000), but it was in contrast with another study in Qatar (Zahra, 2016) where benign epithelial cysts formed the most common, and in Nigeria where the germ-cell tumor was the commonest pathology (Onyiaorah , 2011).

Surface epithelial tumor formed the commonest reported neoplasm (61.16%). Germ cell tumors (35.9%) formed the second most common type, among which mature cystic teratoma (22%) was the commonest type. Such observation is in agreement with other studies from Iraq and Iran (Arab *et al*., 2010; Rasha, 2007), but in contrary to other study where mature cystic teratoma was the third commonest tumor (Abduljabbar *et al*., 2015).

We reported 3 cases of sex-cord stromal tumors which included 2 cases of fibrothecoma and a single case of granulosa cell tumor. Such observation is similar to other studies (Zahra, 2016; Jha and Karki, 2008).

Endometriosis is difficult to be determined accurately and commonly seen in the ovaries (Agarwal and Subramanian, 2010; Woodward *et al*., 2001). This study showed five (3.1%) cases of endometriosis. These findings were similar to (Gupta *et al*., 2010), but appear to be very low compared to European studies (Guerriero *et al.*, 2009; De Kroon *et al*., 2004) this discrepancy may be attributed to the clinical diagnosis or the absence of the histological specimens of endometriosis in our studies. The molecular pathology of ovarian cancer is heterogeneous and involves various putative precursor lesions and multiple pathways of development (Christie and Oehler, 2006). The main subject in our research is ovarian cyst with few ovarian cancers and in the near future we have articles mainly involves ovarian cancer where molecular pathology and immunohistochemical method used in their diagnosis, classification and treatment.

Conclusion

Most ovarian lesions were functional non-neoplastic followed by benign neoplastic. Apart from few cases, diagnosis was merely histological without any ancillary test.

References

Abduljabbar HS, Bukhari YA, Al Hachim EG, Ashour GS, Amer AA, Shaikhoon MM, Khojah MI (2015). Review of 244 cases of ovarian cysts. *Saudi Medical Journal* **36**: 834.

Agarwal N, Subramanian A (2010). Endometriosis- Morphology, clinical presentations and molecular pathology. *Journal of Laboratory Physicians* **2**: 1-9.

Ahmad Z, Kayani N, Hasan SH, Muzaffar S, Gill MS (2000). Histological pattern of ovarian neoplasma. *Journal of Pakistan Medical Association* **50**: 416.

Arab M, Hashemi M, Masoumi N, Yaseri M, Golfam F, Ebrahimi M (2010). Surgical histopathology of benign ovarian. *Iranian Journal of Pathology* **5**: 132-136.

Christie M, Oehler MK (2006). Molecular pathology of epithelial ovarian cancer. *British Menopause Society Journal* **12**: 57-63.

de Kroon CD, Van der Sandt HAGM, Van Houwelingen JC, Jansen FW (2004). Sonographic assessment of non-malignant ovarian cysts: does sonohistology exist? *Human Reproduction* **19**: 2138-2143.

Fatima R, Sandhya M, Sowmya TS (2017). Study of histomorphological pattern of ovarian neoplastic and non-neoplastic lesions. *International Journal of Research in Medical Sciences* **5**: 2095-2098.

Guerriero S, Alcazar JL, Pascual MA, Ajossa S, Gerada M, Bargellini R, Melis GB (2009). Diagnosis of the most frequent benign ovarian cysts: is ultrasonography accurate and reproducible? *Journal of Women's Health* **18**: 519-527.

Gupta N, Bisht D, Agarwal AK, Sharma VK (2007). Retrospective and prospective study of ovarian tumours and tumour-like lesions. *Indian Journal of Pathology & Microbiology* **50**: 525-527.

Jha R, Karki S (2008). Histological pattern of ovarian tumors and their age distribution. *Nepal Medical College Journal* **10**: 81-85.

Kant RH, Rather S, Rashid S (2016). Clinical and histopathological

profile of patients with ovarian cyst presenting in a tertiary care hospital of Kashmir, India. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology* **5**: 2696-2700.

Koonings PP, Campbell KEITH, Mishell JD, Grimes DA (1989). Relative frequency of primary ovarian neoplasms: a 10-year review. *Obstetrics and Gynecology* **74**: 921-926.

Onyiaorah IV, Anunobi CC, Banjo AA, Fatima AA, Nwankwo KC (2011). Histopathological patterns of ovarian tumours seen in Lagos University Teaching Hospital: a ten year retrospective study. *Nigerian Quarterly Journal of Hospital Medicine* **21**: 114-118.

Rasha HS (2007). Histological of ovarian cysts in Najaf city, (2005). *Kufa Medical Journal* **10:** 1.

Valentin L, Ameye L, Jurkovic D, Metzger U, Lécuru F, Van Huffel S, Timmerman D (2006). Which extrauterine pelvic masses are difficult to correctly classify as benign or malignant on the basis of ultrasound findings and is there a way of making a correct diagnosis? *Ultrasound in Obstetrics and Gynecology: The Official Journal of the International Society of Ultrasound in Obstetrics and Gynecology* **27**: 438-444.

Woodward PJ, Sohaey R, Mezzetti Jr TP (2001). Endometriosis: radiologic-pathologic correlation. *Radiographics* **21**: 193-216.

Zahra F (2016). Pattern of benign ovarian cysts in Qatari women. *Qatar Medical Journal* **2016**: 17.

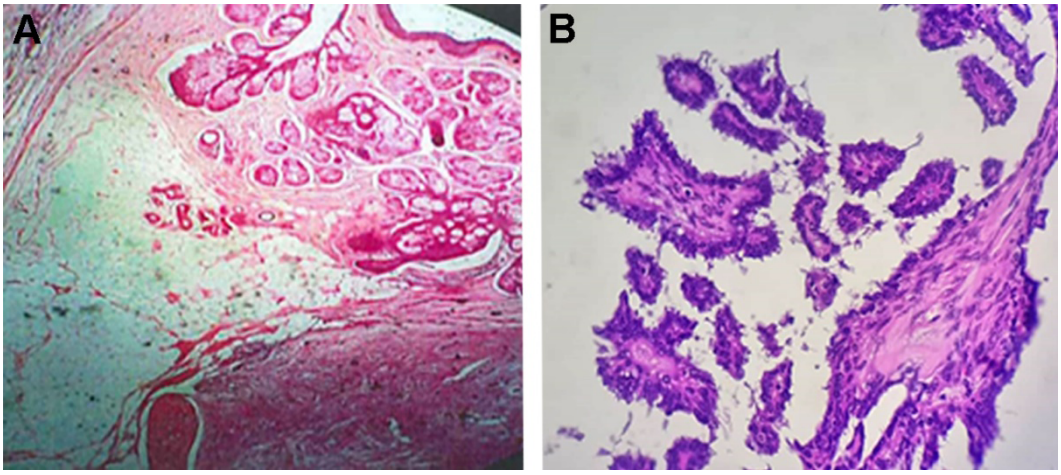

FIGURE 1. (A) Mature cystic teratoma. (B) Papillary serous cystadenoma. Hematoxylin-eosin. Magnification: (A) 100x; (B) 100x.

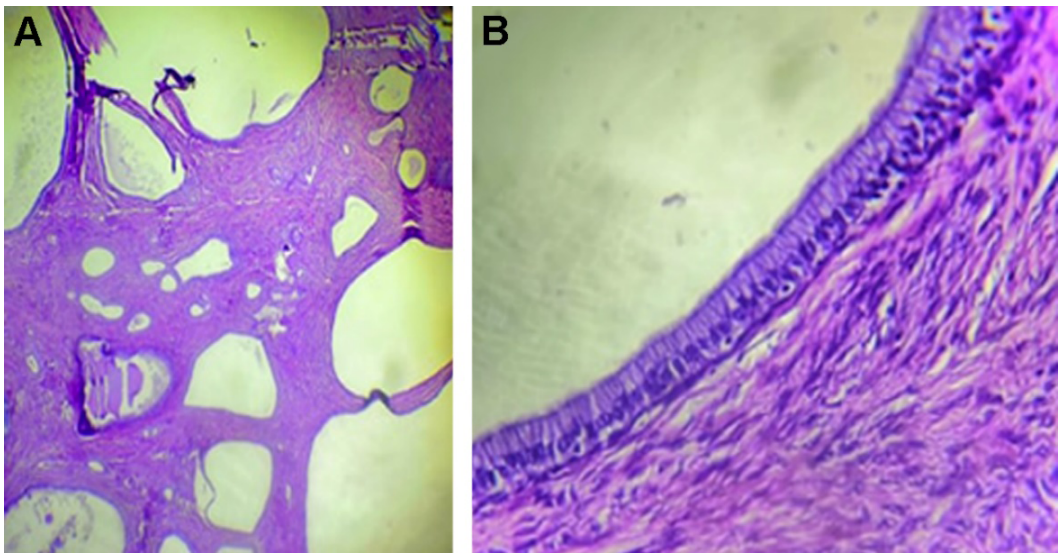

FIGURE 2. Mucinous cystadenoma. Hematoxylin-eosin. Magnification: (A) 100x; (B) 400x.

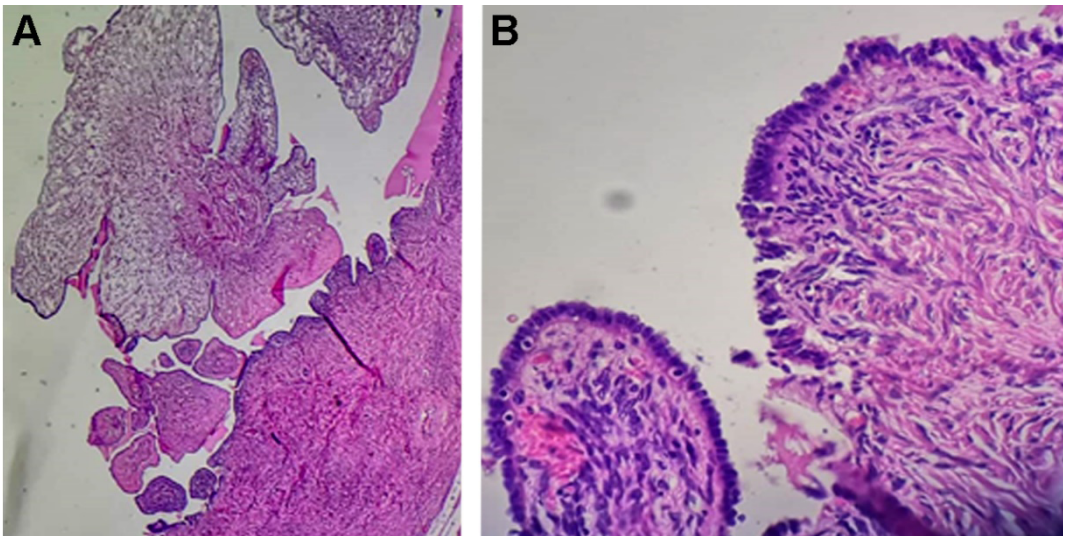

FIGURE 3. (A-B) Serous cystadenofibroma. Hematoxylin-eosin. Magnification: (A) 100x; (B) 400x.

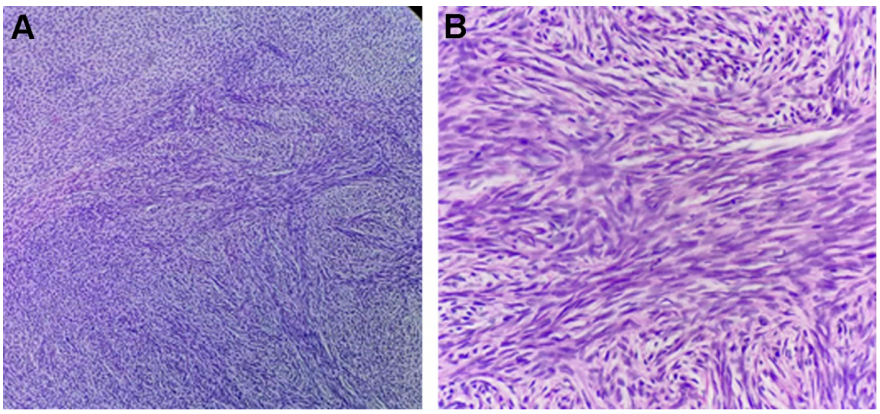

FIGURE 4. (A-B) Fibroma/thecoma. Hematoxylin-eosin. Hematoxylin-eosin. Magnification: (A) 100x; (B) 400x.

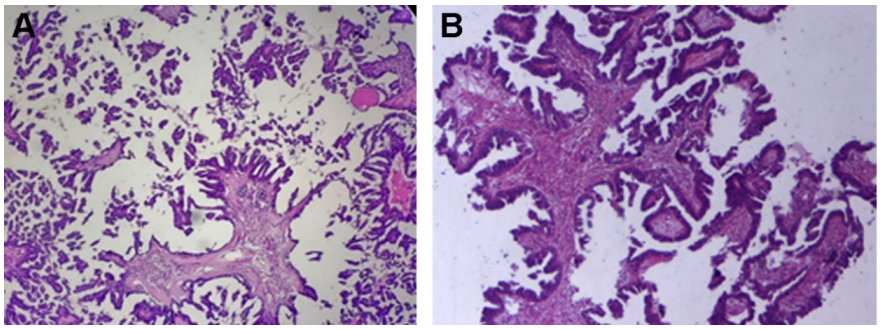

FIGURE 5. (A-B) Serous cystadenoma of borderline malignancy. Hematoxylin-eosin. Magnification: (A) 100x; (B) 400x.

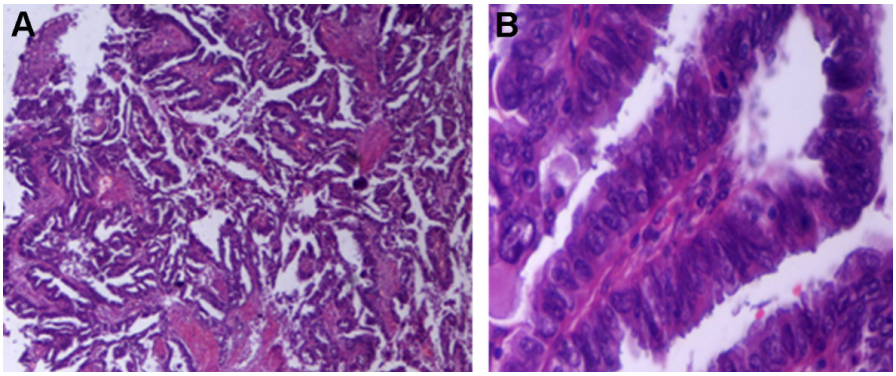

FIGURE 6. (A-B) Serous cystadenocarcinoma (A: 100x; B: 400x). Hematoxylin-eosin. Magnification: (A) 100x; (B) 400x.

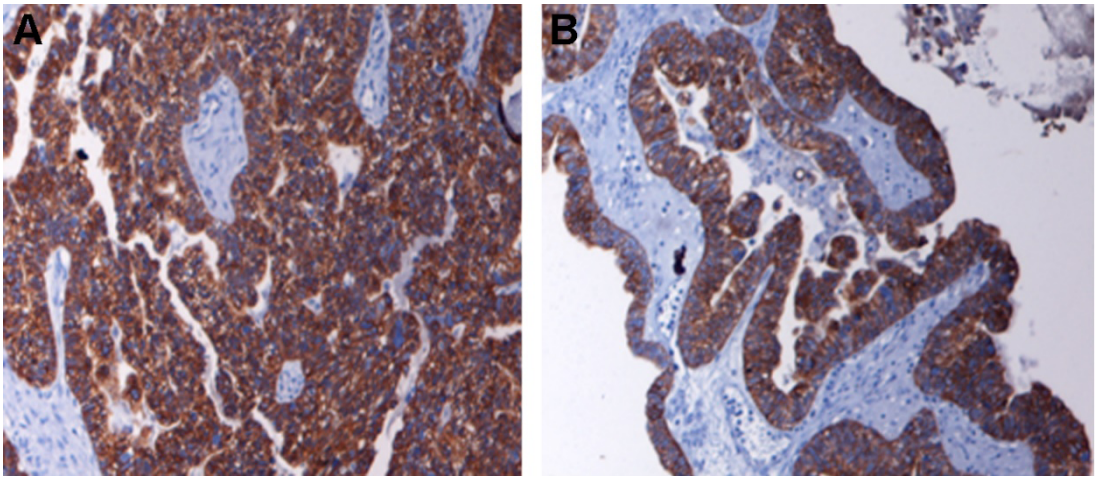

FIGURE 7. Serous cystadenocarcinoma (A) CK7. (B) CA12. Immunohistochemistry. Magnification: (A) 200x; (B) 400x.

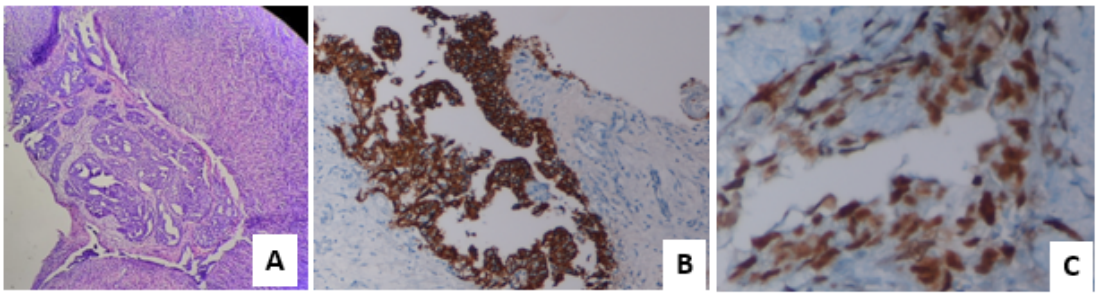

FIGURE 8. Serous cystadenocarcinoma metastasizing to the uterus (A: 100x, hematoxylin-eosin; B: CA125-IHC, 400x; C: WT1- IHC, 400x).

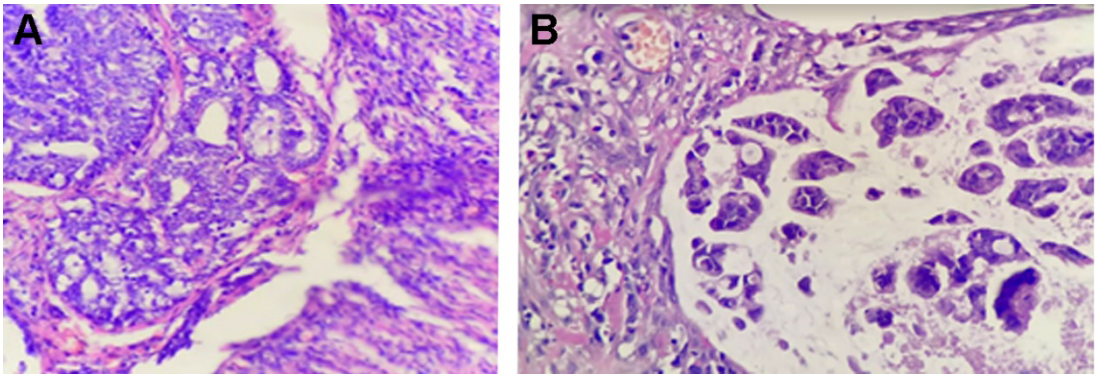

FIGURE 9. (A-B) Mucinous cystadenocarcinoma. Hematoxylin-eosin. Magnification: (A) 200x; (B) 400x.

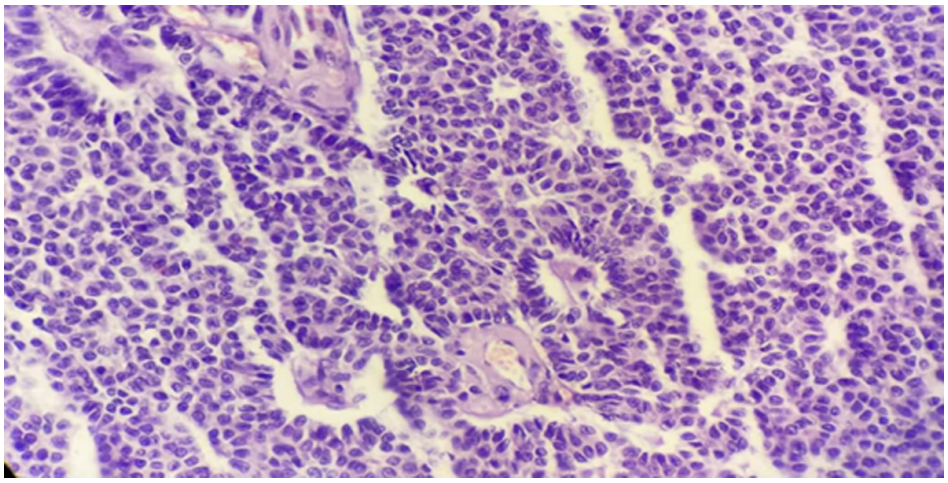

FIGURE 10. Granulosa cell tumor showing the classical coffee bean nuclear pattern. Hematoxylin-eosin. Magnification: 400x.

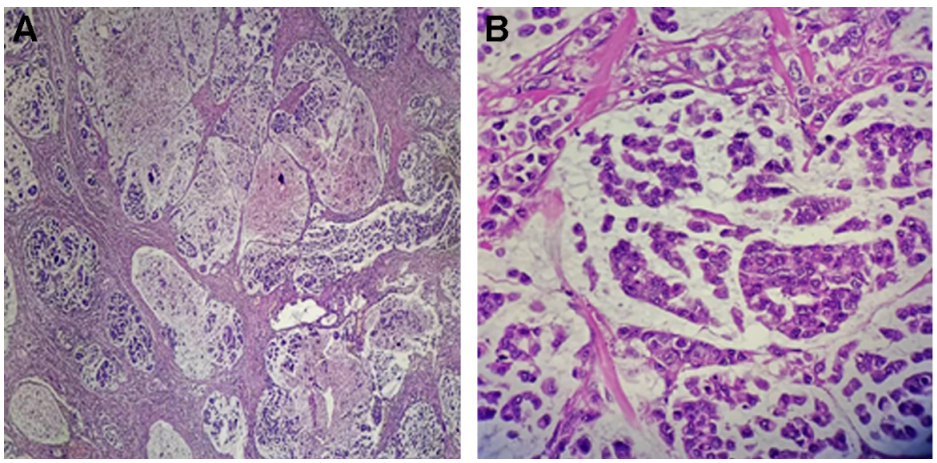

FIGURE 11. Metastatic adenocarcinoma to the ovary "Krukenberg tumor". Hematoxylin-eosin. Magnification: (A) 100x; (B) 400x.