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Case Study

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DYSGERMINOMA TUMOUR IN WOMEN IN THE OVARY

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ABSTRACT

Dysgerminoma is a rare malignant ovarian germ cell tumor accounting for approximately 1–2% of all ovarian malignancies. It predominantly affects adolescents and young women and has favorable outcomes when diagnosed and treated early. Histopathological examination remains the gold standard for establishing the diagnosis. This report aims to describe the clinical, macroscopic, and histopathological characteristics of ovarian dysgerminoma cases in young women and to emphasize the importance of histopathological examination as the gold standard for establishing a diagnosis, thereby. A descriptive case report was conducted on a 22-year-old woman who underwent surgical excision of an ovarian mass at a private hospital in Medan, Indonesia. The excised tissue was submitted to the Anatomical Pathology Laboratory for routine gross and microscopic examination using Hematoxylin and Eosin (H&E) staining. Gross examination revealed a yellowish-gray, irregular, solid ovarian mass measuring 10 × 9 × 5 cm. Microscopic evaluation demonstrated nests and sheets of uniform polygonal tumor cells separated by thin fibrous septa infiltrated by lymphocytes. The tumor cells exhibited enlarged hyperchromatic nuclei, prominent nucleoli, abundant clear to eosinophilic cytoplasm, frequent mitotic figures, and dilated congested blood vessels. These histopathological features were consistent with ovarian dysgerminoma (ICD-O 9060/3). Histopathological examination plays a crucial role in the definitive diagnosis of ovarian dysgerminoma. Recognition of its characteristic microscopic features facilitates accurate diagnosis, appropriate clinical management, and improved prognosis, particularly in women of reproductive age.

Keywords: *Dysgerminoma, ovary, germ cell tumor, histopathology, ovarian neoplasm.*

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ABSTRAK

Disgerminoma adalah tumor sel germinal ovarium ganas yang langka, yang menyumbang sekitar 1–2% dari semua keganasan ovarium. Tumor ini terutama menyerang remaja dan wanita muda dan memiliki prognosis yang baik jika didiagnosis dan diobati sejak dini. Pemeriksaan histopatologi tetap menjadi standar emas untuk menetapkan diagnosis. Laporan ini bertujuan untuk mendeskripsikan karakteristik klinis, makroskopis, dan histopatologis pada kasus disgerminoma ovarium pada wanita usia muda serta menegaskan pentingnya pemeriksaan histopatologi sebagai standar emas dalam menegakkan diagnosis sehingga dapat mendukung penatalaksanaan yang tepat dan meningkatkan prognosis pasien. Laporan kasus deskriptif dilakukan pada seorang wanita berusia 22 tahun yang menjalani eksisi bedah massa

ovarium di sebuah rumah sakit swasta di Medan, Indonesia. Jaringan yang dieksisi dikirim ke Laboratorium Patologi Anatomi untuk pemeriksaan makroskopis dan mikroskopis rutin menggunakan pewarnaan Hematoksilin dan Eosin (H&E). Pemeriksaan makroskopis menunjukkan massa ovarium padat, tidak beraturan, berwarna abu-abu kekuningan berukuran 10 × 9 × 5 cm. Evaluasi mikroskopis menunjukkan sarang dan lembaran sel tumor poligonal seragam yang dipisahkan oleh septa fibrosa tipis yang disusupi oleh limfosit. Sel tumor menunjukkan inti hiperkromatik yang membesar, nukleoli yang menonjol, sitoplasma jernih hingga eosinofilik yang melimpah, gambaran mitosis yang sering, dan pembuluh darah yang melebar dan tersumbat. Ciri-ciri histopatologis ini konsisten dengan disgerminoma ovarium (ICD-O 9060/3). Pemeriksaan histopatologis memainkan peran penting dalam diagnosis pasti disgerminoma ovarium. Pengenalan ciri-ciri mikroskopisnya yang khas memfasilitasi diagnosis yang akurat, manajemen klinis yang tepat, dan prognosis yang lebih baik, terutama pada wanita usia reproduksi.

Kata kunci: Disgerminoma, ovarium, tumor sel germinal, histopatologi, neoplasma ovarium.

INTRODUCTION

Dysgerminomas are germ cell ovarian tumors. About 20% of all ovarian tumors originate from germ cells, whereas only 3% of them are malignant. Dysgerminomas account for about 1% of all germ cell tumors, but they are frequently malignant. They affect young females, prevalently during childhood, and the vast majority of them need and respond well only to chemotherapy. (1,2)

The etiology of dysgerminoma is not well established. They are defined by the World Health Organization (WHO) as tumors composed of primitive germ cells that do not have a specific pattern of differentiation (1,2)

Although rare, dysgerminomas are important beyond mere incidence because they affect women of reproductive age (< 30 years). In fact, dysgerminomas make up two-thirds of all malignant ovarian neoplasms in women younger than 20 years. Moreover, once diagnosed, dysgerminomas respond highly to the prescribed treatments, rescuing patients from infertility and early mortality. (1,2)

Despite its relatively favorable prognosis compared with other malignant ovarian germ cell tumors, ovarian dysgerminoma remains a diagnostic challenge because its clinical manifestations are often nonspecific. Most patients present with abdominal pain, abdominal distension, palpable pelvic mass, or menstrual disturbances that may mimic benign ovarian lesions or other gynecological disorders. Consequently, preoperative diagnosis based solely on clinical examination and imaging is frequently inconclusive. Although ultrasonography, computed tomography (CT), and magnetic resonance imaging (MRI) provide valuable information regarding tumor size and morphology, definitive diagnosis still relies on histopathological examination of the excised specimen. Therefore, pathological evaluation plays a central role in distinguishing dysgerminoma from other ovarian neoplasms and determining appropriate patient management. (1)

Histopathologically, dysgerminoma demonstrates distinctive morphological features that allow differentiation from other malignant germ cell tumors, including yolk sac tumor, embryonal carcinoma, immature teratoma, and mixed germ cell tumors. The characteristic appearance consists of uniform polygonal tumor cells arranged in nests or sheets separated by delicate fibrous septa containing abundant lymphocytic infiltrates. The tumor cells typically exhibit clear to eosinophilic cytoplasm, enlarged vesicular nuclei, prominent nucleoli, and frequent mitotic activity. In challenging cases, immunohistochemical markers such as OCT4, SALL4, D2-40, and CD117 (KIT) may provide additional diagnostic confirmation. Recognition of these pathological characteristics is essential because accurate diagnosis directly influences therapeutic decisions, fertility preservation strategies, and long-term prognosis. (2)

Case reports remain an important scientific contribution, particularly for rare malignancies such

as ovarian dysgerminoma, because they enrich the existing literature regarding clinical presentation, pathological findings, and diagnostic approaches. Furthermore, documentation of clinicopathological characteristics from individual cases contributes to improving physicians' awareness of this uncommon tumor and facilitates early recognition in daily clinical practice. Therefore, this case report presents the gross and microscopic pathological findings of ovarian dysgerminoma in a 22-year-old woman and correlates these findings with current World Health Organization (WHO) diagnostic criteria and relevant literature to emphasize the importance of histopathological examination in establishing an accurate diagnosis and guiding optimal patient management, (1,2).

METHOD

This study was conducted as a descriptive case report involving a 22-year-old female patient who presented with an ovarian mass and underwent surgical excision at a private hospital in Medan, Indonesia, in 2021. The excised surgical specimen was subsequently referred to the Anatomical Pathology Laboratory for histopathological examination. Patient confidentiality was maintained throughout the study by anonymizing all personal identifiers, and the clinical information was presented solely for scientific and educational purposes.

The ovarian specimen was examined macroscopically to assess its size, color, consistency, shape, and associated anatomical structures. After gross examination, representative tissue samples were processed using standard histopathological procedures, including fixation in 10% neutral buffered formalin, routine tissue processing, paraffin embedding, microtome sectioning at approximately 4–5 µm thickness, and staining with Hematoxylin and Eosin (H&E). The prepared slides were evaluated independently under light microscopy at low-, medium-, and high-power magnifications (40×, 100×, and 400×) to identify the characteristic morphological features of the lesion.

The diagnosis was established by correlating the gross pathological findings with the microscopic features observed on H&E-stained sections. Particular attention was given to the architectural pattern, cytological characteristics, stromal components, vascular changes, and mitotic activity. The histopathological findings were then compared with the diagnostic criteria described in the World Health Organization (WHO) Classification of Female Genital Tumours (5th Edition) and other relevant literature to confirm the diagnosis of ovarian dysgerminoma (ICD-O 9060/3).

CASE REPORT

Reportedly, a patient with female gender, A, 22 years old, came to one of the private hospitals in Medan in 2021. The tissue was sent to the Anatomical Pathology Laboratory for histopathological examination. Received one piece of tissue in a container labeled ovarian cyst, yellowish gray color, irregular shape, solid consistency, the tissue size was 10 x 9 x 5 cm, tuba size was 5 x 1,5 cm. Then the tissue was processed for histopathological examination and labeled 190221. Microscopic examination of tissue preparations from the ovary. Tumor cells with a nest-like structure and sheets separated by fibrous connective tissue infiltrated by lymphocytic inflammatory cells. The tumor cells are relatively uniform with enlarged round and oval nuclei, the chromatin is partially rough and hyperchromatic, the nucleoli are partially prominent, and the cytoplasm is partially clear and eosinophilic. Mitosis is found. Blood vessels are dilated and congested.

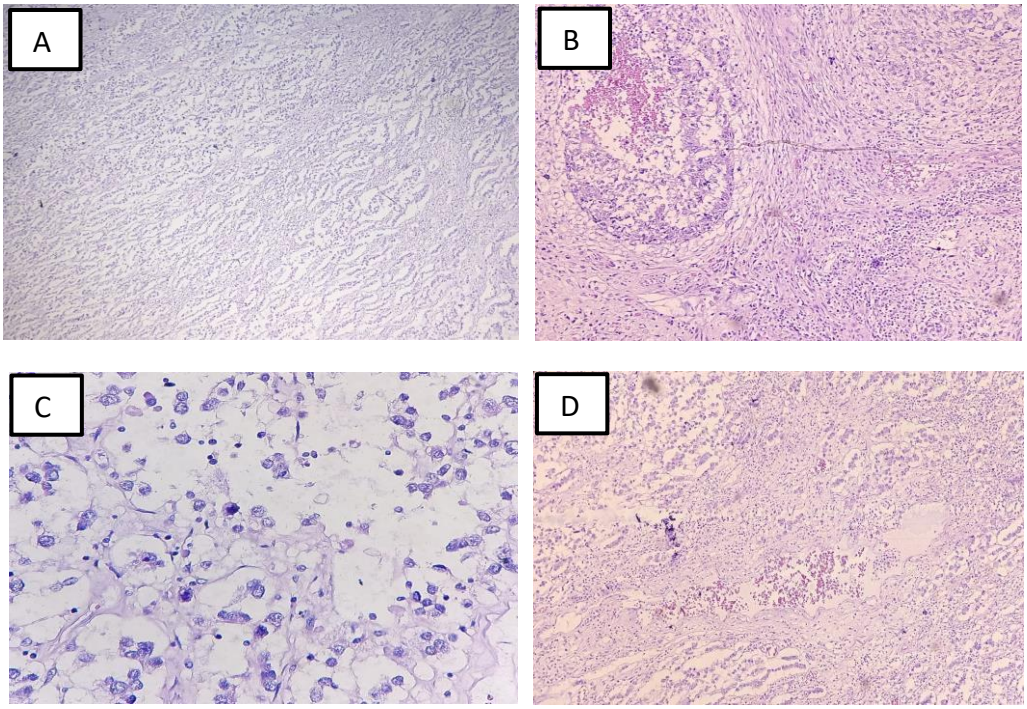


Figure 1. Microscopic appearance of the case with Hematoxylin Eosin staining.

Tumor cells with a nest-like structure and sheets separated by fibrous connective tissue infiltrated by lymphocytic inflammatory cells (**A-40X, B-100X**). The tumor cells are relatively uniform with enlarged round and oval nuclei, the chromatin is partially rough and hyperchromatic, the nucleoli are partially prominent, the cytoplasm is partially clear and eosinophilic. Mitosis is found (**C-400X**). Blood vessels are dilated and congested (**D-100X**).

RESULT

A 22-year-old female patient presented with an ovarian mass and underwent surgical excision at a private hospital in Medan, Indonesia, in 2021. The excised specimen was submitted to the Anatomical Pathology Laboratory for histopathological examination. Gross examination revealed a yellowish-gray ovarian mass with an irregular shape and solid consistency, measuring 10 × 9 × 5 cm. The attached fallopian tube measured 5 × 1.5 cm. The tissue specimen was processed routinely and prepared for microscopic evaluation

Microscopic examination with Hematoxylin and Eosin (H&E) staining demonstrated tumor cells arranged predominantly in nests and solid sheets separated by thin fibrous connective tissue septa infiltrated by numerous lymphocytic inflammatory cells. The neoplastic cells appeared relatively uniform and polygonal, with abundant clear to eosinophilic cytoplasm and enlarged round to oval nuclei. The chromatin was coarse and hyperchromatic, while prominent nucleoli were observed in many tumor cells. Frequent mitotic figures were identified, indicating active cellular proliferation.

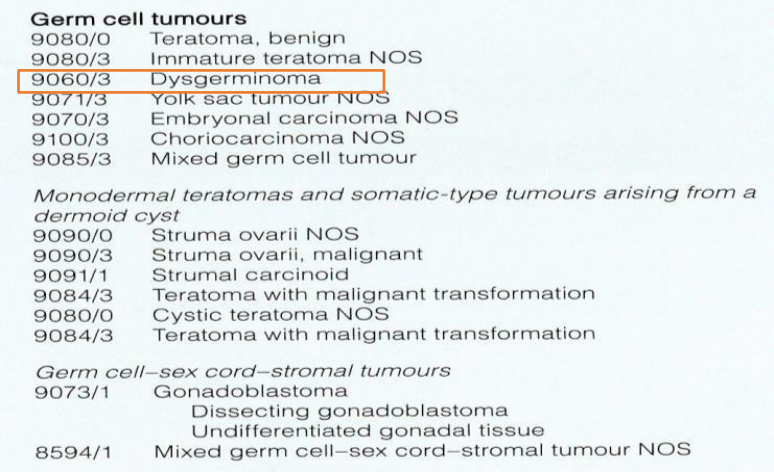
Additional microscopic findings showed dilated and congested blood vessels within the tumor stroma without evidence of extensive hemorrhage or necrosis. The overall histopathological architecture was characterized by well-defined nests of tumor cells separated by delicate fibrous septa, a feature commonly associated with ovarian dysgerminoma. These morphological findings were consistently observed across multiple microscopic fields at different magnifications (40×, 100×, and 400×).

Based on the gross and microscopic pathological findings, the lesion was diagnosed as ovarian dysgerminoma (ICD-O 9060/3). The histopathological characteristics observed in this case, including the solid growth pattern, uniform polygonal tumor cells, fibrous septa infiltrated by lymphocytes, enlarged hyperchromatic nuclei, prominent nucleoli, and frequent mitotic activity, were consistent with the established diagnostic criteria for dysgerminoma described in the current World Health Organization classification of female genital tumors.

DISCUSSION

Dysgerminoma is a primitive germ cell tumour composed of cells showing no specific differentiation. It is the most common Ovarian Malignant Germ Cell Tumors (OMGCT), accounting for 1%–2% of primary ovarian neoplasms and 32.8%–37.5% of all OMGCTs. Most cases occur in adolescence and early adulthood, although it may occur at any age, with reported cases ranging from 7 months to 70 years old. Other literature is also said to occur at the age of < 30 years. Most patients are symptomatic and present with pain, bloating, and menstrual disorders.[1,2,3,4]

According to the 2020 World Health Organization (WHO) Cassification of Tumors of female genital tumours, dysgerminoma are coded as ICD - O 9060/3. Here is the list of entities.[3,4,5]



Germ cell tumours

9080/0	Teratoma, benign
9080/3	Immature teratoma NOS
9060/3	Dysgerminoma
9071/3	Yolk sac tumour NOS
9070/3	Embryonal carcinoma NOS
9100/3	Choriocarcinoma NOS
9085/3	Mixed germ cell tumour

Monodermal teratomas and somatic-type tumours arising from a dermoid cyst

9090/0	Struma ovarii NOS
9090/3	Struma ovarii, malignant
9091/1	Strumal carcinoid
9084/3	Teratoma with malignant transformation
9080/0	Cystic teratoma NOS
9084/3	Teratoma with malignant transformation

Germ cell–sex cord–stromal tumours

9073/1	Gonadoblastoma
	Dissecting gonadoblastoma
	Undifferentiated gonadal tissue
8594/1	Mixed germ cell–sex cord–stromal tumour NOS

Figure 2. Classification of tumours of female genital tumours according to WHO.[3]

The exact etiology of dysgerminomas has not been determined, although molecular studies have implicated loss of function with potential tumor suppressor geneTRC8/RNF139 as a possible cause. Additionally, 5% of all dysgerminomas occur in dysgenetic gonads and may be associated with gonadoblastomas.[3,5] The macroscopic appearance of dysgerminoma typically obout 15 cm and appear fleshy, yellow or cream colored, solid and lobulated. Cystic degeneration, haemorrhage, and necrosis maybe present. Calcified areas may indicate a focus of gonadoblastoma in the tumour. About 20% are bilateral, although the contralateral tumour may not be evident on macroscopic examination.[3,6,7,8,9] Macroscopic picture of the case according to the literature.

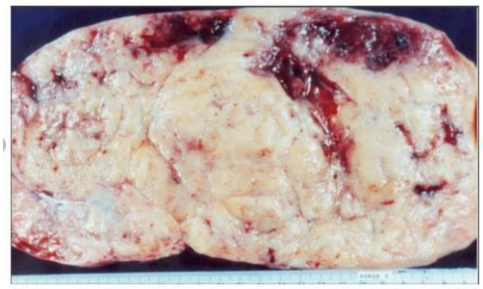


Figure 3. Macroscopic of dysgerminoma.[6]

Microscopic dysgerminoma is in the form of sheets and nests of monotous tumour cells are separated by thin fibrous septa containing lymphocytes. Less common pattern include cords, trabeculae, solid tubules, and pseudoglands. Tumour cells are polygonal, with well defined cell borders, abundant clear or eosinophilic cytoplasm, and one central nucleus with one or two prominent nucleoli. Nuclear contours may have an angular, squared off appearance. Mitosis are common. [10,11,12]Scattered syncytiotrophoblastic cells are present in a minority of tumours. The surrounding stroma may contain poorly formed granulomas, which may obscure the tumour, especially in metastatic sites. Rarely, dysgerminoma may contain foci of spermatocytic tumor like cells.[3,7] Microscopic picture of the case according to the literature.

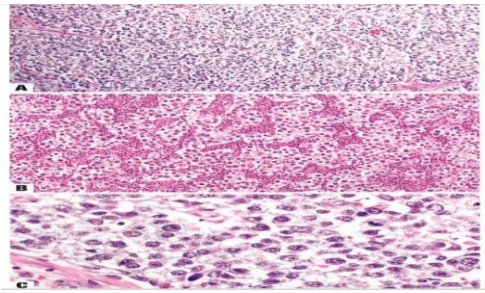


Figure 4. Dysgerminoma. Monotous polygonal tumour cells are arranged in nests defined by thin fibrous septa (**A)**. Fibrous septa between aggregates of tumour cells countainvariable numbers of lymphocytes (**B**). The nuclei of dysgerminoma tumour cells often exhibit angular or squared-off countours and prominent nucleoli. Mitosis are common. [3]

Tumor markers may aid in the diagnosis and postoperative monitoring of ovarian dysgerminomas. Tumor marker elevation is dependent on the type of tissue components that comprise a mass. Elevation of β-HCG and serum LDH can be seen in association with a dysgerminoma, as documented in the case report. Beta human chorionic gonadotropin will be produced and levels elevated if syncytiotrophoblasts are present in the tumor, but less than 5% of patients will have increased HCG. [14,15,16] LDH is an enzyme found in almost all body tissues, and levels rise with cell damage. Elevated LDH is noted in most cases of ovarian dysgerminomas. Alpha-fetoprotein values, which are elevated in some types of malignant ovarian germ cell tumors, are negative in dysgerminomas. Quantification of the tumor markers β-HCG and LDH at diagnosis allows for monitoring of tumor recurrence after treatment.[3,8]

Dysgerminoma is immunohistochemically positive for SALL4, OCT4, LIN28, NANOG, KIT (CD117) and D2-40 .[17] The main neoplasms in the differential diagnosis of ovarian dysgerminoma is lymphoma, yolk sac tumor, embryonal carcinoma, and Sertoli cell tumor.[8,9]
This entity is staged according to the Union for International Cancer Control (UICC) TNM classification and the FIGO staging system.[3,10]

CONCLUSION

Dysgerminomas are the most common of primitive germ cell tumors of the ovary, accounting for 1-5% of all ovarian malignancies. The reproductive age group females are most commonly affected. The macroscopic appearance of dysgerminoma typically obout 15 cm and appear fleshy, yellow or cream colored, solid and lobulated. Cystic degeneration, haemorrhage, and necrosis maybe present. Microscopic dysgerminoma is in the form of sheets and nests of monotous tumour cells are separated by thin fibrous septa containing lymphocytes. Less common pattern include cords, trabeculae, solid tubules, and pseudoglands. Tumour cells are polygonal, with well defined cell borders, abundant clear or eosinophilic cytoplasm, and one central nucleus with one or two prominent nucleoli. In this case, a 22-year-old woman is reported, based on macroscopic and microscopic examinations that are in accordance with the literature, a diagnosis was made Dysgerminoma, ICD-O 9060/3.

SUGESSTION

Further studies involving larger numbers of patients are recommended to improve the understanding of the clinical presentation, histopathological characteristics, immunohistochemical profiles, treatment outcomes, and long-term prognosis of ovarian dysgerminoma. Early recognition through comprehensive clinical evaluation, radiological assessment, and histopathological examination is essential to establish an accurate diagnosis and provide timely management. In addition, multidisciplinary collaboration among gynecologists, oncologists, radiologists, and pathologists is strongly encouraged to optimize patient care, preserve fertility whenever possible, and improve overall survival and quality of life in young women affected by this rare malignant ovarian germ cell tumor.

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CONFLICT OF INTEREST

The authors declare that there are no financial, personal, institutional, or other relationships that could inappropriately influence or bias the work presented in this case report. The authors have no conflicts of interest regarding the publication of this manuscript, and all findings, interpretations, and conclusions are presented objectively based on the clinical and histopathological evidence obtained from the reported case.

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