DETEKSI DINI KANKER OVARIUM MENGGUNAKAN INTERNATIONAL OVARIAN TUMOR ANALYSIS (IOTA)

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ABSTRACT

Ovarian cancer is one of the most lethal gynecological malignancies, with approximately 70% of cases diagnosed at an advanced stage. It ranks as the fourth leading cause of cancer-related deaths among women. The prognosis of ovarian cancer improves significantly when detected early, but the disease is often asymptomatic in its initial stages, leading to delayed diagnosis and poorer outcomes. Because of its low cost and accessibility, ultrasound has proved to be the most useful diagnostic tool for adnexal masses. Ultrasound can be used to distinguish benign from malignant adnexal masses using IOTA simple rules. Early detection of ovarian cancer is important for reducing mortality from ovarian cancer. A case report of Mrs. SW, a 34-year-old woman came to Arifin Achmad Hospital who presented with palpable of abdominal mass. The patient underwent a series of diagnostic tests, including physical examination, ultrasound, abdominal CT scan, and histopathology. On ultrasound examination, found an adnexal mass suspected ovarian cancer by using International Ovarian Tumor Analysis (IOTA). The IOTA simple rules describe five typical features of benigna (B) tumours and five typical features of malignant (M) tumours. It had high sensitvity and specificity for discriminating between malignant and benign adnexal tumour. Preoperative diagnose of malignant adnexal mass using IOTA simple rules were confirmed by postoperative pathology analysis shown a bilateral fibrosarcoma ovary. Early diagnosis is important for reducing mortality from ovarian cancer. Imaging techniques, such as ultrasound (US) have been used in the preoperative assessment of adnexal tumours. IOTA simple rules can distinguish benign from malignant adnexal masses. It can provide an important reference for clinical decision making.

Keywords: Ovarian Cancer, International Ovarian Tumor Analysis (IOTA), Adnexal Mass.

INTRODUCTION

Ovarian tumors are common gyneological disease and have a spesific malignancy rate. Asian/Pacific Islander women are one of four groups with the highest ovarian cancer prevalance (9.2 per 100.000). This tumor filled with fluid structures that might be simple or complex remembering the adnexa is structures that connect to the uterus including ovaries and fallopian tubes (Terzic et al., 2021). The cause of cystic ovarian are physiologically normal and malignancy (Pakhomov

et al., 2021). However, infertility treatment, tamoxifen, pregnancy, hypothyroidism, maternal gonadotropins, cigarrete smoking, tubal ligation are the risk factors for cystic ovarian neoplasm ("Practice Bulletin No. 174: Evaluation and Management of Adnexal Masses.," 2016). About 4% of women will be admitted to hospital for ovarian cysts by the time they are 65. The majority of these cysts are benign. Mature cystic teratomas or dermoids account for more than 10% of all ovarian neoplasms (Melnyk et al., 2025). Ovarian cysts are the most common tumour in infants and fetuses, with a prevalence of more than 30%. Symptoms of cystic ovarian neoplasm can be vary. The women might feel the symptoms or it can be asymptomatic as well. Most women may experience unilateral pain or tenderness in the lower abdomen. If cyst ruptured, woman may feel acute abdominal pain with nausea and or/ vomiting. In the emergency room, health care provider should perform bi-manual exam to determine location, shape, size, consistency, level of tenderness and mobility of the tumor ("Practice Bulletin No. 174: Evaluation and Management of Adnexal Masses.," 2016).

The initial evaluation of ovarian tumors plays an essential role in categorizing patients and planning treatment. Among these techniques, ultrasound continues to be a helpful tool and the first choice for identifying and characterizing adnexal masses. To date, many preoperative classification systems using ultrasound to characterize ovarian tumors have been publisher, such as International Ovarian Tumor Analysis (IOTA) simple rules (2008) (Dang Thi Minh et al., 2024). Treatment of cystic ovarian neoplasm depends on the patient's age, menopausal status, the size of the cyst and the characteristics of cyst (whether it is benign or malignancy). In benign cyst it usually become smaller and resolve spontaneously by 14-16 weeks of gestation with conservative management. Likewise, surgical procedures is indicated following suspected ovarian torsion, persistent adnexal mass, suspected malignancy. Every surgery is made to remove minimal ovarian tissue (Modesitt et al., 2003).

LITERATURE REVIEW

The International Ovarian Tumor Analysis (IOTA) Group suggested a more straightforward method known as "easy instant diagnosis," which is based on a number of ultrasonography characteristics of the tumor and includes simple rules and simple descriptors. These methods are well-described to their simplicity, and it has been demonstrated that the basic guidelines work effectively when applied by non-expert examiners. These methods served as the foundation for IOTA's three-steps clinically focused approach. IOTA has a sensitivity of 84.8% and specificity of 98.9% (Dang Thi Minh et al., 2024). The three-steps in differentiating between benign and malignant adnexal masses. Malignant masses tend to be more

RESEARCH METHODS

This study is in the form of a case report obtained from a patient who did further examine of the symptoms she was experiencing. The study process began with the identification of general information, history taking, physical examination, and additional workup with ultrasound. The patient's diagnose is confirmed using the International Ovarian Tumor

Analysis. (IOTA). The procedure for treating the patient is surgery, which is considered more appropriate in this case.

CASE REPORT

The patient felt that her abdomen was enlarged for 6 months. She has had lower abdominal pain for the past week. She also had difficulty breathing when the symptoms occurred. The patient had examined at the Gynecological Polyclinic of Arifin Achmad General Hospital and had been told that it was cystic ovarian neoplasm suspected malignant. The score for International Ovarian Tumor Analysis (IOTA) had been analyzed was in M2 category. Physical examination was good with blood pressure 126/90 mmHg, heart rate 88 bpm, 26 x/i, SpO2 98% and temperature 36.7°C. The abdomen appeared distended with a palpable mass in the left lower quadrant the size of a baby's head and a shifting dullness, fainter on percussion, hypo-active bowel sounds. On bi-manual examination there was a mass with the upper pool at the level of the umbilicus on the left adnexa and the lower pool at the level of the symphisis. Gynecologic ultrasound showed a normal sized ante-flexion uterus with endometrial line, normal left ovary, a hypo-echoic mass on the right ovary measuring 13,85x16,72x16,15 cm with multilocular, septa and papillae (Figure 1) and ascites. The patient was diagnosed as P1A0H1 + cystic ovarian neoplasm, suspected malignant based on IOTA (Figure 2). The procedure to treat this patient is laparotomy salpingo-oophorectomy. The sample that had been taken from the procedure was examined in the department of pathological anatomy. The result confirmed malignancy. The patient was recommended to follow concervative surgical procedure eventually.

DISCUSSION

Ovarian cysts are still one of the most common diseases found in daily practice. This disease is mostly experienced by women of menopausal age although it is possible that pre-menopausal women can also experience it. While some ovarian cysts are symptomatic, many are asymptomatic, making screening difficult. Proper early diagnosis provides well management. Treatment of ovarian cysts is based on the anatomical pathology results obtained after the surgical procedure. Several studies have shown that the subjective impression of the examiner is the initial modality in recognising an adnexal mass. However, this diagnosis is highly dependent on the level of expertise of the examiner. The limitation of expert examiners is a challenge in the initial evaluation of these adnexal masses. Therefore, a scoring system and logistic modalities were devised to facilitate some inexperienced examiners (Pakhomov et al., 2021; Terzic et al., 2021).

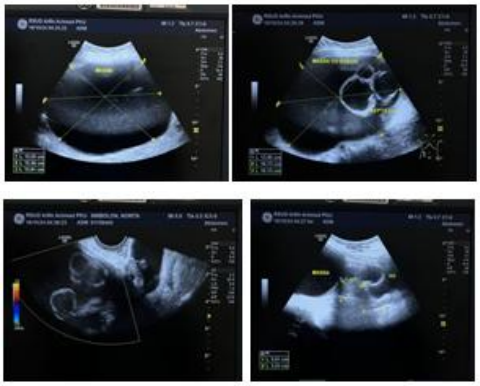

Figure 1. Ultrasound shows a hypo-echoic mass on the right ovary measuring 13,85x16,72x16,15 cm with multilocular, septa and papillae

Complicated and difficult to categorize than benign tumors. Basically, IOTA is determined based on ultrasound as the first-line imaging technique. In order to identify adnexal masses as benign or malignant, the three IOTA phases rely on the sequential application of basic descriptors, basic rules, and an examiner's subjective opinion.This procedure consists of women doing trans-vaginal or trans-rectal ultrasound. Trans-abdominal ultrasound is also performed in cases of large tumors. First, the basic descriptors were used. Serum CA-125 levels and ultrasound results serve as the foundation for simple descriptors (Figure 2) (Alcázar et al., 2016).

If the mass could not be identified using basic descriptors as either benign or malignant, subsequently move on to step two, when the mass is categorized by the examiner using basic guidelines. Five ultrasound characteristics indicating of cancer and five indicated of benignity serve as the foundation for simple principles.

In the final step, if the mass has not been determined, the examiner will use their subjective judgment to determine whether the tumor is benign, malignant, or indeterminate. If the classification is unclear, the mass is managed as a malignant tumor, and the woman is referred to the gynecological oncology division. The tumor is then removed, and an anatomical pathology examination is conducted as the standard of reference.

Malignant tumors are classified into the International Federation of Gynecology and Obstetrics classification (FIGO) stage. For analytical purposes, borderline ovarian tumors were classified as malignant; masses that were managed expectantly and thus lacked a definitive reference standard were deemed benign if the lesion resolved on its own (Dang Thi Minh et al., 2024; Modesitt et al., 2003).

Simple descriptors	*Simple rules*
Benign descriptors	Benign features
Unilocular tumor with ground-glass echogenicity in premenopausal woman	Unilocular tumor
Unilocular tumor with mixed echogenicity and acoustic shadows in premenopausal woman	Largest diameter of largest solid component < 7 mm
Unilocular anechoic tumor with regular walls and largest diameter of lesion < 100 mm	Acoustic shadows
Unilocular tumor with regular walls	Smooth multilocular tumor with largest diameter < 100 mm
Malignant descriptors	No intratumoral blood flow on color or power Doppler
Tumor with ascites and at least moderate color Doppler blood flow in postmenopausal woman	Malignant features
Woman aged > 50 years and CA-125 > 100 IU/mL	Irregular solid tumor
	Ascites
	At least four papillary projections
	Irregular multilocular solid tumor with largest diameter ≥ 100 mm
	Very strong intratumoral blood flow on color or power Doppler

Figure 2. Simple descriptors and simple rules for classifying adnexal masses IOTA

Alcazar et al.'s research revealed that 89% of adnexal masses could be categorized using basic rules and/or descriptions. IOTA's sensitivity and specificity in that research were 93% and 92%, respectively (Alcázar et al., 2016). According to a study by Testa et al. that involved 2403 women and 18 European centers, 80% of adnexal masses could be categorized using the three steps identified 66 false-negative patients, of which 12 were ovarian metastatic cancers, 13 were stage I primary invasive ovarian cancers, 7 were stage II–IV primary invasive ovarian cancers, and 34 were borderline tumors (Testa et al., 2014). In this case report, we conclude that IOTA is advantageous for early detection of suspected invasive cancer and for early diagnosis of ovarian tumors, particularly for experienced but inexperienced expert examiners.

CONCLUSION

IOTA as early detection of suspected invasive cancer and for early diagnosis of ovarian tumors is useful and advantageous, particularly for experienced but inexperienced expert examiners.

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