PATHOLOGICAL AND STATISTICAL STUDY OF MALIGNANT OVARIAN TUMORS

Thesis submitted in fulfillment of the requirements of master degree in pathology

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ABSTRACT

Introduction:

Ovarian cancer is the second most frequent gynecological malignancy after endometrial cancer ***(Fields et al., 2000)***. Unfortunately, this cancer is difficult to detect early in its evolution when it is still curable ***(Hensley et al., 2000).*** These tumors predominate in women older than 60 years, but may occur in younger women with family history of the disease ***(Prat et al., 2005).*** Most frequently encountered tumors arise from surface epithelium and are termed common epithelial tumors. Other important groups include germ cell tumors, sex cord-stromal tumors, steroid cell tumors, and tumors metastatic to the ovary. About one sixth of ovarian tumors are of a mixed type ***(Zuntova et al., 1992).***

Material&methods:

Slides and data collected from the archives of the Pathology Department, Kasr El Einy Hospital during the period between 1st January 2004 and last December 2008. Data obtained from pathology sheet: age of patients diagnosed to have malignant ovarian tumors, as well as significant pathological criteria, e.g.: tumor size. The slides were revised and classified according to the recent grading and staging systems, and statistical analysis was done for clinicopathological correlation.

Results:

From the collected cases, most common type was epithelial tumors represented the highest percentage (53.3%) followed by sex cord stromal tumors (26.7%) then germ cell tumors (11.7%).The mean age was 43.57 years ranging between 11- 74 years. With most cases diagnosed at stages II and III.

Key words: Ovarian cancer-registry

LIST OF ABBREVIATIONS

AFP	Alpha fetoprotein
ASR	Age Standardized Incidence Rates
CEA	Carcinoembryonic antigen
EMA	Epithelial membrane antigen
EOC	Epithelial ovarian cancer
ER and PR	Estrogen and Progesterone receptors
FIGO	International Federation of Gynecology and Obstetrics
FSH	Follicle-stimulating hormone
GCT	Granulosa cell tumor.
hCG	human Chorionic Gonadotropin
HNCC	Hereditary nonpolyposis colon cancer.
PLAP	Placental-like alkaline phosphatase.
SEER	Surveillance, Epidemiology, and End Results
SLCT	Sertoli-Leydig cell tumor.
WHO	World health organization
YST	Yolk sac tumor.

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Introduction

Ovarian cancer represents the sixth most commonly diagnosed cancer among women in the world, and causes more deaths per year than any other cancer of the female reproductive system. Established risk factors for ovarian cancer include age and having a family history of the disease, while protective factors include increasing parity, oral contraceptive use, and oophorectomy ***(Permuth-Wey et al., 2009).***

Family history of breast or ovarian cancer is a prominent risk factor for ovarian cancer, with 5-10% of ovarian cancers due to heritable factor. ***(Salehi et al., 2008).***

Although ovarian cancer is less frequent in our community, yet the significant positive and negative association between risk factors and ovarian cancer are similar to other studies, apart from the primary prevention program that should be outlined according to prevalence of significant risk factors ***(El-Khwsky et al., 2006).***

Ovarian tumors exhibit a wide variety of histological features. The histological classification of ovarian tumors by the World Health Organization (WHO) is based on histogenetic principles, and this classification categorizes ovarian tumors with regard to their derivation from coelomic surface epithelial cells, germ cells, and mesenchyme (the stroma and the sex cord). Epithelial ovarian tumors, which are the majority of malignant ovarian tumors, are further grouped into histological types as follows: serous, mucinous, endometrioid, clear cell, transitional cell tumors (Brenner tumors), carcinosarcoma, mixed epithelial tumor, undifferentiated carcinoma, and others ***(Kaku et al., 2003).***

There are more than 25 major types of ovarian neoplasms. With variants and rare entities, they number over 100 ***(Fritz et al., 2000).*** The most common

malignancy, serous adenocarcinoma (also termed serous cystadenocarcinoma), ***(Greenlee et al., 2001).***

The broad range of histologic features in these tumors reflects the diverse anatomical structure of the ovary itself. The classification of ovarian tumors identifies them by the tissue of origin ***(Kosary et al., 2007).***

AIM OF THE STUDY

-Registeration of all diagnosed cases of malignant ovarian tumors in the last 5 years (2004-2008), collected from the Pathology Department, Faculty of medicine, Cairo University, Kasr El Einy Hospital.

-Study of the most important clinicopathological features of malignant ovarian tumors.

-Morphological classification of the cases according to the WHO system 2003 will be revised.

-The application of the most recently recommended grading and staging (FIGO) systems of malignant ovarian tumors.

- Correlation between clinicopathological features of malignant ovarian tumors and other data available in the request sheets such as age and laterality.

Anatomy and histology of the ovaries

Gross Anatomy

The ovaries are paired pelvic organs that lie on either side of the uterus close to the lateral pelvic wall, behind the broad ligament and anterior to the rectum. Each ovary is attached along its anterior (hilar) margin to the posterior aspect of the broad ligament by a double fold of peritoneum, the mesovarium; at its medial pole to the ipsilateral uterine cornu by the ovarian (or utero-ovarian) ligament; and from the superior aspect of its lateral pole to the lateral pelvic wall by the infundibulo-pelvic (or suspensory) ligament. The location of the ovary posterior to the broad ligament and a similar relationship of the ovarian ligament to the ipsilateral uterine (fallopian) tube aids in the determination of the laterality of a salpingo-oophorectomy specimen ***(Pryse-Davies et al., 1974).***

Prepubertal Ovaries

The ovary in the newborn is a tan, elongated, and flattened structure that lies above the true pelvis. It sometimes has a lobulated appearance with irregular edges. It has approximate dimensions of 1.3 cm by 0.5 cm by 0.3 cm, and a weight of less than 0.3 gm ***(Nicosia et al., 1983).*** Throughout infancy and childhood, the ovary enlarges, increases in weight 30-fold, and changes in shape, so that by the time of puberty it has reached the size, weight, and shape of the adult ovary, and lies within the true pelvis, inspection of the external and cut surfaces, particularly during the first few months of life and at puberty, may reveal prominent cystic follicles similar to those seen in polycystic ovary disease ***(Merrill et al., 1963)***.

Adult Ovaries

Adult ovaries are ovoid with dimensions of approximately 3.0 to 5 cm by 1.5 to 3.0 cm by 0.6 to 1.5 cm, and a weight of 5 to 8 gm. Their size and weight, however, vary considerably depending on their content of follicular derivatives. They have a pink-white exterior, which in early reproductive life is usually smooth, but thereafter becomes increasingly convoluted. Three ill-defined zones are discernible on the cut surface: an outer cortex, an inner medulla, and the hilus. Follicular structures (cystic follicles, yellow corpora lutea, and white corpora albicantia) are typically visible in the cortex and medulla ***(Boss et al., 1965).***

Postmenopausal Ovaries

After the menopause, the ovaries typically shrink to approximately one half their sizes in the reproductive era; their size varies considerably, however, with the number of ovarian stromal cells and unresorbed corpora albicantia. Most postmenopausal ovaries have a shrunken, gyriform, external appearance, while some are more smooth and uniform. They have a firm consistency and a predominantly solid, pale cut surface, although occasional cysts measuring several millimeters in diameter (inclusion cysts) may be discernible within the cortex. Small white scars (corpora albicantia) are typically present within the medulla. Thick-walled blood vessels may be appreciable within the medulla and the hilus ***(Pavlik et al., 2000).***

Histology

Surface Epithelium

The surface epithelium of the ovary consists of a single, focally pseudo stratified layer of modified peritoneal cells. The cells vary from flat to cuboidal to columnar and several types may be seen in different areas of the same ovary. The surface cells are separated from the underlying stroma by a distinct basement. This epithelium is extremely fragile and is almost always denuded in oophorectomy specimens because of undesirable rubbing of the surface by the surgeon and the pathologist, as well as lack of prompt fixation resulting in drying. Preserved epithelium is often confined to areas protected by surface adhesions or lining sulci ***(Blaustein et al., 1984).***

Stroma

As the cortical and medullary stroma is continuous and similar in appearance, the boundary between these two zones is ill defined and arbitrary, the spindle-shaped stromal cells, which have scanty cytoplasm, are typically arranged in whorls or a storiform pattern. Fine cytoplasmic lipid droplets may be appreciable with special stains, especially in the late reproductive and postmenopausal age groups ***(Matias-Guiu et al., 1998).***

Immunohistochemical stains reveal cytoplasmic vimentin, actin, and desmin Stromal cells are separated by a dense reticulum network and a variable amount of collagen that is most abundant in the superficial cortex. Although the latter is frequently referred to as the tunica albuginea, it lacks the densely collagenous, almost acellular appearance and sharp delineation of the tunica albuginea of the testis ***(Lastarria et al., 1990).***

Granulosa cells are almost entirely formed from their embryonic precursors by the time of birth ***(Valdes-Dapena et al., 1967).*** Those within