Ovarian Cancer: Facts and Figures

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Demographics

- Ovarian cancer is the fifth leading cause of cancer death in women
- Only 20% of women present with early-stage disease
- Overall 5 year survival is less than 50%

At the same time, physiologic cysts and benign cystic neoplasms are much more common than ovarian cancer, so imaging-based risk stratification must balance sensitivity (cancer detection) with specificity (ability to rule out cancer among benign lesions, which are much more common).

Risk factors

- Age: the risk of ovarian cancer increases with age; most women with ovarian cancer are over 50 years old
- Hormones: Unopposed estrogen and obesity increase cancer risk
- Number of lifetime ovulations: nulliparity and later age of first pregnancy increase risk, while oral contraceptives, multiparity, and breast feeding decrease risk
- Genetic syndromes: 25% of ovarian cancer occurs in women with syndromes including BRCA1, BRCA2 and Lynch Syndrome

Histologic subtypes

- 90% of ovarian cancer is epithelial in origin, and the subtypes are presented in the Table below.
- The most common and aggressive subtype of epithelial ovarian cancer is high grade serous carcinoma (HGSC), notable for its early intraabdominal spread.
- Malignant mucinous tumors were historically overestimated because many mucinous adnexal masses are metastases from gastrointestinal malignancies. Most mucinous neoplasms arising in the ovary are benign.

Table: Epithelial tubo-ovarian malignancies

Subtype		Proportion of malignant epithelial tumors	Clinical presentation	Serum tumor markers	Approximate five-year survival
Serous	**High grade**	63%	Stage III-IV most common, postmenopausal abdominal bloating and pelvic mass	CA-125 HE4	40%
	Low grade	2%	About 50% of patients have locoregional disease and 50% advanced at presentation	CA-125 HE4	70%

Mucinous	10%	>80% stage I, carcinomatosis is uncommon but advanced disease may feature pseudomyxoma peritonei	CA-125 CA-19-9 CEA	80-90%
Clear cell	10%	Most stage I-II	CA-125 CA-19-9	95% for locoregional disease
Endometrioid	10%	Most stage I-II	CA-125 HE4	85% for locoregional disease
Carcinosarcoma	<5%	Stage III most common, slightly older than HGSC cohort	CA-125	30%
Brenner tumor	< 1%	Only 1% of Brenner tumors are malignant but these are aggressive; benign forms may secrete excess estrogen	CA-125	30%

Pathogenesis and implications for imaging

- High grade serous cancer does not actually arise from the ovary, but from fallopian tube precursors called serous tubal intraepithelial carcinoma (STIC). STIC lesions are solid tumors throughout their life cycle, rather than cystic. These solid tumors are difficult to identify on ultrasound when they are small.
- Non-high grade serous cancers are thought to arise from precursor lesions that are cystic, or from endometriosis. These pre-cursor lesions are seen on imaging and can be followed.
- Currently, there is insufficient evidence to support general population level imaging-based screening for ovarian cancer. Reliable detection of STICs would be needed in order to enable early detection and save lives, and should be a focus of imaging research.

References

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