What Does Borderline Ovarian Tumor Mean to Your Fertility?

Fertility in women diagnosed with borderline ovarian tumors can be reduced or lost due to surgical treatment. Counseling regarding fertility preservation shortly after diagnosis can increase the chance of pregnancy following treatment.

Borderline-low malignant potential ovarian tumors

The cells in borderline tumors, proliferate more than benign ovarian cysts but less than frank malignant ovarian tumors. Multiple layers of these cells are seen on pathology slides, but they do not invade surrounding tissues as in malignant tumors. They are diagnosed in approximately 4000 of women each year in the US and are more commonly encountered in reproductive age women. These tumors are usually cystic, sometimes with surrounding implants. Low malignant potential tumors are treated surgically (removal of cyst, removal of the ovary or sometimes removal of both ovaries and the uterus). They generally do not require chemotherapy for treatment. The majority of these tumors are associated with very high survival (10 year survival >90% in stage I and II), although some may recur or turn malignant.

There is no difference in survival if borderline tumors were treated with removal of the cyst, removal of the ovary or removal of the uterus and both ovaries. Recurrence may be lower after hysterectomy (5%) compared to salpingoophorectomy (15%) and cyst excision (30%). The high rate for recurrence
after conservative surgery indicates the need for strict and long term follow up (pelvic exams, ultrasound and tumor markers). Some recurrences take place years after initial surgery and are sometimes malignant.

**Fertility risks in women diagnosed with borderline tumors**

Fertility risks in women diagnosed with low malignant potential ovarian tumors include loss of ovarian tissue and pelvic scarring that can block the fallopian tubes especially if open approach is used for treatment compared to laparoscopy (minimal access surgery). Some loss of ovarian tissue does occur even during cyst removal from the ovary. Ovarian reserve can be tested after surgery using transvaginal ultrasound evaluation for ovarian volume and number of antral follicles. Ovarian function can also be assessed using day 2 FSH and estradiol levels and antimullerian hormone (AMH).

**Fertility preservation strategies in women diagnosed with borderline ovarian tumors**

1. **Conservative surgery**

Ovarian cystectomy can be considered in reproductive age women, especially in early disease with favorable pathology and absence of implants. Recurrence is relatively high but can be managed with repeat excision if not malignant. If pregnancy is desired following surgery, fertility factors; ovulation, fallopian tubes and sperm factors should be investigated and treated accordingly.

2. **Embryo and oocyte cryopreservation**

Women at risk for diminished fertility due to surgery, especially if requiring removal of the ovaries or repeat
excision of cyst, can consider ovarian stimulation, egg retrieval and egg freezing or IVF and embryo freezing. There is no evidence that ovarian stimulation and exposure to high estrogen increases the risk for recurrence. It is not clear if borderline cells are sensitive to estrogen increase during ovarian stimulation. Two options are available to reduce estrogen exposure: to perform IVF in a natural cycle (low egg yield) or to modify the stimulation protocol, through adding an aromatase inhibitor, similar to that used for breast cancer. Alternatively, short stimulation followed by retrieval of immature eggs followed by in vitro maturation can be performed.

Women diagnosed with borderline ovarian tumors are at risk for diminished fertility because of surgical treatment(s). This is especially true if repeat surgical excision is required. Collaboration between a gynecologic oncologist and a reproductive endocrinologist enable adequate surgical treatment, strict follow up and preservation of future fertility in reproductive age women.