In The name of God

Risk-reducing salpingo-oophorectomy in patients at high risk of epithelial ovarian and fallopian tube cancer

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Risk-reducing bilateral salpingo-oophorectomy

- (rrBSO) is an important option for reducing the risk of developing epithelial ovarian and fallopian tube cancer in patients with a hereditary ovarian cancer syndrome.
- Risk-reducing surgery includes **bilateral removal of the tubes as well as the ovaries** because some apparent ovarian cancers are initiated in the fallopian tubes, particularly in patients with pathogenic variants in the breast cancer susceptibility (*BRCA*) genes, *BRCA1* and *BRCA2*
- alternative preventive and surveillance measures are of **limited efficacy** in reducing the high rate of cancer mortality in such patients.

CANDIDATES

- rrBSO is reserved for patients **at the highest risk** of epithelial ovarian and fallopian tube cancer and is consistently recommended in guidelines for patients in the following categories:
- ●Patients with pathogenic variants in ***BRCA1*****,** with a lifetime risk of ovarian cancer 35 to 46 percent.
- ●Patients with pathogenic variants in ***BRCA2***, with a lifetime risk of ovarian cancer 13 to 23 percent.
- ●**Lynch syndrome** a **lifetime risk of ovarian and endometrial cancer up to 38 and 71%**respectively
- ●rrBSO has also been suggested for patients with pathogenic variants in ***BRIP1, RAD51C, RAD51D*** [

Risk-reducing bilateral salpingo-oophorectomy

- When **performed before age 50, rrBSO is also associated with a decreased risk for breast cancer** in *BRCA* carriers with no prior breast cancer.
- When performed with hysterectomy, rrBSO reduces the risk of endometrial and ovarian cancer in patients with Lynch syndrome

PREOPERATIVE EVALUATION AND PREPARATION

Counseling and consent

- Patient risk, expected reduction
- **Alternatives, less effective**
- Consequences ,infertility and premature menopause.
- menopause and its treatment
  - vaginal dryness,
  - changes in libido
  - sexual function,
  - sleep disturbances,
  - hot flashes,
  - osteoporosis,
  - mood changes,
  - risk of coronary heart disease

Counseling and consent

- oocyte and embryo cryopreservation(no partner,.)
- Chance of detecting occult malignancy,additional Surgery
- Peritoneal carcinoma

Timing

- rrBSO should be performed **as soon as childbearing is complete** or by **age 35 to 40** years since the benefit diminishes with age
- ovarian and fallopian tube cancer, **is uncommon before age 40** and rare before age 30
- ***BRCA1*** mutations have a significant rise in ovarian cancer risk beginning at **35 years** of age, with 2 to 3 percent of these patients developing ovarian cancer by age 40 years; the average age at diagnosis is **50 years**
- *BRCA2* mutation carriers reach a 2 to 3 percent incidence of ovarian cancer a decade later, by age **50** years; the **average age at diagnosis is 60 years**,

Timing

- **Gains in life expectancy** after rrBSO have been estimated using decision analysis
- Life expectancy gains **declined with age at the time of surgery** and were minimal for 60 year-old patients, although there was **little loss in life expectancy if was performed at age 40** rather than age 30.
- Patients with **Lynch syndrome** typically develop ovarian cancer between the ages of 43 and 48 years
- In general, we recommend **rrBSO in the mid-40s for patients with Lynch syndrome**

Preoperative evaluation

Prior to rrBSO, patients should undergo **screening** for an ovarian malignancy

- pelvic sonography
- cancer antigen 125 (CA 125)

PROCEDURE

Surgical approach

- The surgical route may be by **laparoscopy** or laparotomy. Laparoscopy is generally preferable since it is associated with less morbidity and allows for an outpatient procedure

- BSO versus salpingectomy alone

minimum is bilateral salpingo-oophorectomy since "ovarian" epithelial neoplasms have three potential sites of origin:

  - ovary,
  - fallopian tube
  - other müllerian epithelial sites in the pelvis.

Salpingectomy

- if oophorectomy is not performed, it is unclear whether the surgeon can remove the entire **fimbriated end of the fallopian tube**, which may be the most likely site of tubal malignancy .
- surface of the ovary and mesovarium may **contain tubal epithelium**, which is a potential site of origin of epithelial ovarian carcinoma.
- diminish or eliminate the **possible prophylactic effect on breast cancer**
- "Radical salpingectomy, may diminish ovarian function

Abdominopelvic evaluation

- When rrBSO is performed, a methodical survey should be conducted of the abdomen
  - diaphragm,
  - liver,
  - omentum,
  - bowel,
  - paracolic gutters,
  - appendix),
  - pelvis (ovaries, fallopian tubes, uterus, posterior cul-de-sac)
  - entire peritoneum.
- Some surgeons perform an **omental biopsy and cytologic smear of the diaphragm**
- Suspicious areas should be biopsied with **liberal use of frozen section**

Scope of resection

- **All ovarian tissue** should be removed
- ●**If adhesions** between the ovary and other peritoneal structures are present, **the entire adhesion should be resected** with the ovary to ensure that no residue
- ●The ovarian artery and vein should be **clamped and cut at least 2 cm** proximal to the ovary, and preferably at the pelvic brim, to avoid leaving any ovarian tissue behind
- The **pelvic peritoneum should be opened** to visualize the **ureter** and isolate the infundibulopelvic ligament before transection. Complications are infrequent in experienced hands
- ●As much of the fallopian tube as possible should be removed.
- **Complete fimbrial resection is important**, but complete cornual resection to remove the intramural **(interstitial) portion of the tube does not appear to be necessary**, particularly during laparoscopic procedures

Should concurrent hysterectomy be performed?

- Lynch syndrome
- Take tamoxifen
- Unopposed estrogen
- Disadvantage:increasing morbidity

Pathology evaluation

- Multiple 2 to 3 millimeter longitudinal sections of the resected ovaries and fallopian tubes should be examined microscopically **for occult carcinoma** using a protocol specific for patients at high risk of an occult malignancy

- Sectioning and Extensively Examining the FIMbria (SEE-FIM) protocol

Follow up

- Occult malignancy on pathology
- Surveillance for peritoneal cancer
- Management of premature menopause

LESS EFFECTIVE ALTERNATIVES TO RRBSO

- Intensive screening to detect early stage disease
- Chemoprevention
- Hysterectomy and tubal ligation

OPPORTUNISTIC SALPINGECTOMY

- Opportunistic salpingectomy has been proposed as a **primary prevention strategy** for patients at **average risk** of carcinoma of the ovary, fallopian tube, and peritoneum.

- Definition — Opportunistic salpingectomy as a strategy was first presented in September 2010 by the British Columbia Ovarian Cancer Research (OVCARE) team, which distributed an educational video

Opportunistic salpingectomy

- **removal of the fallopian tubes in a patient undergoing pelvic surgery for another indication**. It is appropriate in patients who have completed childbearing or no longer plan to use their own tubes for fertility purposes.
- **Common procedures** that may potentially include opportunistic salpingectomy include:
  - ●**Hysterectomy for benign** indications
  - ●**In place of tubal ligation** for patients who desire sterilization
  - Opportunistic salpingectomy **should not take the place of risk-reducing bilateral salpingo-oophorectomy**

Opportunistic salpingectomy

- A Danish case-control study of over 13,000 patients with ovarian cancer included 17 who underwent bilateral salpingectomy; among those patients, there was a **42 percent decrease** in the risk of epithelial ovarian carcinoma compared with controls

Acta Obstet Gynecol Scand. 2015 Jan;94(1):86-94. Epub 2014 Oct

Technique at hysterectomy:

- ●**Elevate the fallopian tube and dissect** along the mesosalpinx immediately below the tube to allow separation from the ovary. Any cautery/dissection tool may be used.
- Care should be taken **not to compromise the ovarian vessels** within the infundibulopelvic ligament.
- ●Proceed with hysterectomy as usual with the tubes removed en bloc (attached at the cornua of the uterus).

Opportunistic salpingectomy

- Randomized trials of opportunistic salpingectomy at the time of hysterectomy have found **no additional impact on ovarian reserve**
- In the largest trial, 104 patients ages 30 to 55 years underwent hysterectomy, with or without opportunistic salpingectomy; the median change in **anti-müllerian hormone level was similar**

- *Van Lieshout LAM, ... Piek JMJ Maturitas2018;107:1. Epub 2017*

Final message

- **rrBSO is the standard of care,**

but risk-reducing salpingectomy is an **investigational alternative** surgical approach that has been proposed.

Thanks