

Oophoropexy: a relevant role in preservation of ovarian function after pelvic irradiation

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Objective: To report on our experience with girls and young women who received treatment for Hodgkin lymphoma, underwent prior oophoropexy to preserve their ovarian function, and subsequently gave birth.

Design: Retrospective monoinstitutional evaluation.

Setting: National Cancer Institute.

Patient(s): Eleven girls given treatment for Hodgkin lymphoma and undergoing bilateral ovarian transposition at a median age of 13 years.

Intervention(s): The ovaries were positioned behind the uterus by the general surgeon.

Main Outcome Measure(s): Fourteen pregnancies were recorded among these 11 women, with 12 live births (1 twin) and 3 miscarriages.

Result(s): None of these women needed the ovaries to be relocated, and none of them resorted to artificial insemination. Their median age at the time of first pregnancy was 31 years, and the median time elapsing since ovarian transposition was 14 years.

Conclusion(s): This series confirms that oophoropexy can preserve ovarian function and enable future pregnancy. We encourage pediatric oncologists, surgeons, and radiotherapists to bear this option in mind when considering female patients for pelvic irradiation. (Fertil Steril® 2009;91:935.e15–e16. ©2009 by American Society for Reproductive Medicine.)

Key Words: Oophoropexy, fertility, radiotherapy, childhood cancer

Because treatment for pediatric cancer affords a high cure rate, the patient's future health status has become a new challenge, and progress now is being made in the reduction of treatment-related complications and preservation of reproductive function.

The effects of radiation on the ovary are age and dose dependent. Irreversible ovarian failure is certain at delivery dose to both ovaries of 4 to 7 Gy in women older than 40 years. The ovaries are more resistant in prepubertal girls, and ovarian failure is not sure. Nevertheless it has been reported that with a wide range of dose (12 to 50 Gy), primary amenorrhea occurred in 68% of cases treated at a mean age of 6.9 years (1).

In 1976 Le Floch et al. (2) reported on eight infants born to six patients who had undergone oophoropexy before pelvic

irradiation for Hodgkin lymphoma (HL). Oophoropexy was once widely used in HL, but the technique fell out of favor because it prevented surgical staging and restricted the radiotherapy fields.

Oophoropexy can be performed with use of laparoscopic technique, however, and it has proved effective in sparing ovarian function and enabling women of reproductive age to become pregnant (3–5). The procedure also enables a portion of ovary to be obtained for cryopreservation (5, 6). We report here on our experience with women given treatment for HL and undergoing prior oophoropexy who subsequently gave birth, with a view to emphasizing its efficacy and feasibility in all cases requiring pelvic radiotherapy.

PATIENTS

Eleven women who underwent treatment at the Istituto Nazionale Tumori with bilateral ovarian transposition were found; cases of monolateral oophoropexy were excluded. All patients had a diagnosis of HL and had undergone oophoropexy between 1972 and 1988.

The patients' median age at diagnosis was 13 years (range 9–22 years); all but two underwent laparotomy for staging, and, during the same procedure, their ovaries were positioned

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behind the uterus by the general surgeon. Among these, five girls received mantle plus inverted Y field irradiation as sole therapy, and four were given treatment with the same field of radiotherapy plus chemotherapy (mechlorethamine, Oncovin, procarbazine, prednisone [MOPP] or Adriamycin, bleomycin, vinblastine, dacarbazine [ABVD], or MOPP-ABVD regimens).

The other two girls with stage I and IV HL underwent oophorectomy at the time of relapse, 2 and 9 years later, respectively. At diagnosis these last two girls both were given chemotherapy (MOPP and MOPP-ABVD regimens) plus radiotherapy not involving the pelvic area.

Fourteen pregnancies were recorded among these 11 women, with 12 live births (1 twin) and 3 miscarriages.

None of these women needed the ovaries to be relocated, and none of them resorted to artificial insemination. Their median age at the time of first pregnancy was 31 years (range 20–36 years), and the median time elapsing since ovarian transposition was 14 years (range 5–23 years).

Institutional review board approval was not available because we retrospectively reviewed our patients with oophorectomy and subsequent pregnancies. All cases were included in the institutional database. Biological studies or any clinical or instrumental evaluations were not necessary for this article.

COMMENT

In an attempt to protect ovarian function in young females given radiation therapy for HL, oophorectomy was first performed at the time of surgical staging in 1968 at Stanford University Medical Center, where the efficacy of this procedure in retaining ovarian function and enabling pregnancy was demonstrated in 60% of patients (2). Many years have passed, and our series confirms the validity of oophorectomy. Recent studies showed that ovarian function was preserved in 88.6% of patients under 40 years old (7). The debate concerning long-term cancer survivors and their future state of health and fertility is gaining more attention. On the whole, these topics have prompted clinicians to seek effective treatments while reducing iatrogenic sequelae (8–10). Where intensive treatments are still necessary, however, projects are underway to enable the cryopreservation of portions of ovary for future follicle maturation in vitro and/or autografting procedures (4, 6, 11).

The use of oophorectomy is not restricted to HL but could be considered in all cases for which pelvic irradiation is planned. In our series we have described a medial ovarian transposition, but ovaries also can be displaced laterally or to more distant sites, depending on the radiation field (4, 12, 13). The technique is feasible with use of a laparoscopic approach; it

is technically straightforward, and a portion of ovary can be collected for cryopreservation.

Some authors suggested that bilateral transposition will require subsequent assisted reproductive technologies, because of the potential damage of fallopian tubes (14). In our series all women conceived spontaneously. Despite its benefits, this technique seems to have been neglected, and it is well recognized that it has been underused in both pediatric and adult settings (4, 5).

In conclusion, our series confirms that oophorectomy can preserve ovarian function and enable future pregnancy. We encourage pediatric oncologists, surgeons, and radiotherapists to bear this option in mind when considering female patients for pelvic irradiation.

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