

Chemotherapy-Induced Infertility in Patients With Testicular Cancer

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A 29-year-old Caucasian married man, Mr. A, is the father of a 1-year-old daughter and is a successful tax attorney who maintains a healthy lifestyle. While performing a testicular self-examination, Mr. A noticed a small, fixed mass in his left scrotum. After medical workup, biopsy, and consultation, a left orchiectomy and retroperitoneal dissection were recommended. Pathology revealed a nonseminoma germ cell testicular tumor, pT4, N4, M-positive; with tumor invading the scrotum; vascular and lymphatic invasion; and a solitary lung lesion noted on computed tomography scan. No additional metastatic lesions were found on bone scan or magnetic resonance imaging. Biopsy confirmed the metastatic lesion in the lung. Postoperatively, Mr. A was scheduled to receive four cycles of bleomycin, etoposide, and cisplatin (BEP), a standard treatment for testicular germ cell cancer.

Mr. A and his wife had been planning to have a second child. In initial consultation with the oncologist, Mr. A brought up the topic. He and his wife wanted to know whether his cancer or any of his treatment would have an effect on their ability to conceive. The oncologist gently explained that a decrease in fertility occurs with testicular cancer, which is compounded by orchiectomy and chemotherapy. The oncologist informed Mr. A that, during chemotherapy, sperm counts usually are low and often undetectable, with only 20%–50% of patients treated with chemotherapy resuming normal sperm counts two to three years after completion of treatment (Kreuser, Harsch, Hetzel, & Schreml, 1986; Nijman, Schraffordt Koops, Kremer, & Sleifer, 1987). Mr. A and his wife were alarmed to learn that it was impossible to predict whether or when he would resume normal sperm counts or whether he would remain azoospermic (i.e., the absence of sperm in the semen). Fertility options were discussed with Mr. A and his wife.

They decided to opt for sperm banking, agreeing that if it did not work, they would consider adoption. Mr. A completed his four cycles of chemotherapy and was in full remission one year later. After attempting to conceive for one year, Mr. A's sperm count remained low at 18 million per ml (normal count is greater than 20 million per ml), identifying the need to use the sperm banked earlier. Two years after Mr. A completed treatment, Mrs. A underwent two cycles of insemination and successfully gave birth to a healthy daughter. Mr. and Mrs. A were grateful that they were made aware of their options and had time to make the necessary fertility arrangements before Mr. A started chemotherapy. Mr. A remains disease free.

Testicular Cancer and Infertility

In 2011, 8,290 estimated cases of testicular cancer will be diagnosed in the United States, with an estimated 350 deaths. The incidence of testicular cancer is increasing for unknown reasons (American Cancer Society [ACS], 2011). As advances with combination chemotherapy and radiation are made, a significant number of patients are being cured of testicular cancer. Unfortunately, a major side effect of treatment includes temporary or permanent loss of fertility. Testicular cancer most frequently occurs in men ages 15–35; therefore, fertility and sexual functioning are important issues to discuss prior to treatment.

Sperm cryopreservation is the only preventative course of action currently available for conserving fertility in young men with cancer (Trottmann et al., 2007). The procedure of cryopreservation is the storing at low temperatures of biologic materials, such as sperm, for long periods of time—as long as 50 years. The process of sperm banking often takes a total of two weeks and requires three to six sperm donations,

all completed prior to beginning chemotherapy. The cost of cryopreservation through a typical sperm bank is \$250 for initial sperm freezing and consultation. Subsequent sperm freezing is \$200 per donation and an additional monthly storage fee of \$70 (Sperm Bank, Inc., 2011).

Although sperm banking is a viable option to spare fertility, it remains elusive for many patients. In a study regarding knowledge and experience regarding infertility, only 24% of young men with cancer were found to bank their sperm and only 51% had been offered sperm banking (Schover, Brey, Lichtin, Lipshultz, & Jeha, 2002b). The most commonly accepted reason for the low percentage of sperm banking was the lack of information given to young men by their healthcare team. In an investigation of oncologists' attitudes and practices regarding sperm banking, barriers for discussing the opportunity with patients were identified. Those included lack of time for discussion, a perception of high cost factors, and a lack of knowledge regarding convenient facilities for referral (Schover, Brey, Lichtin, Lipshultz, & Jeha, 2002a). A survey of 45 men with cancer by Edge, Holmes, and Makin (2006) reported that only 67% of young men aged 13–21 years had banked their sperm prior to gonadotoxic therapy. Reasons given included anxiety at diagnosis, difficulty in talking about fertility, and a lack of understanding about sperm banking.

Men with testicular cancer often are young and may not be thinking about having children at the time of diagnosis; however, oncology healthcare professionals must discuss fertility issues and raise the topic of cryopreservation. In a study aimed at identifying the psychological impact of sperm banking, the majority of patients interviewed who banked sperm on their own initiative experienced a noticeable positive psychological effect (Saito, Suzuki, Iwasaki,