



## SEMEN CRYOPRESERVATION - IN MEN WITH CARCINOMA RECTUM: A NEW HOPE

### Obstetrics & Gynaecology

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### ABSTRACT

We present a case of a 28-year-old man referred to our Reproductive Medicine and Research Department from a cancer institute for semen cryopreservation prior to gonadotoxic treatment in view of rectal carcinoma. We cryopreserved four vials of husband's semen. Intra Cytoplasmic Sperm Injection (ICSI) was done after the completion of radiotherapy and chemotherapy. The first ICSI cycle was successful and his wife delivered twins at term gestation.

### KEYWORDS

Semen cryopreservation, Rectal carcinoma, Chemotherapy, Radiotherapy.

### INTRODUCTION

Colorectal cancer (CRC) is the third most common diagnosed cancer worldwide. The lifetime risk of developing it is about 1 in 23 (4.4%) for men<sup>[1]</sup>. The incidence of CRC in young men is often being diagnosed at an advanced stage and requiring chemotherapy and / or radiotherapy. In the absence of adequate counselling and semen cryopreservation this may result in the irreversible loss of fertility for these young men. The global burden has been rising rapidly owing to changing demographics, lifestyle habits, westernization and inadequate access to healthcare<sup>[2]</sup>.

### CASE STUDY

A 28-year-old male actively married for two years to a 24-year-old female was referred to our reproductive center, for semen cryopreservation. The husband was diagnosed with adenocarcinoma of rectum. He had no familial history of colorectal cancer. The couple was counselled to undergo sperm cryopreservation prior to start of gonadotoxic therapy and four vials of semen samples were cryopreserved. The husband's semen parameters were within normal limits by WHO 2010 criteria. The husband received 28 cycles of Neoadjuvant chemo-radiotherapy (NACTRT) followed by Robotic Low anterior resection (LAR) with right pelvic lymph node dissection (PLND) with ileostomy. Post-surgery six cycles of Capox (capecitabine and oxaliplatin) chemotherapy were given over a period of six months. Two months post chemotherapy completion he was re-operated for ileostomy closure. Since follow up after 6 months showed complete resolution of CRC, the oncology unit referred the patient to us once again for family building. After appropriate evaluation, the fertility parameters of the wife were observed as normal. Considering the pre-thaw condition of the cryopreserved vials, the couple was offered one cycle of Intrauterine Insemination (IUI). However, the couple did not conceive in this IUI cycle and therefore were offered ICSI. After obtaining appropriate consents, eleven oocytes were retrieved in the subsequent cycle, of which 6 day 3 embryos of grade A were cryopreserved. Two of these cryopreserved embryos were subsequently thawed, cultured to day 5 and transferred leading to a successful twin pregnancy. The antenatal period was uneventful and she delivered two female babies, 2.8 kg and 2.4 kg with Apgar score of 9/10 each at 37.2 weeks of gestation.

### DISCUSSION

Almost 90% of CRCs are adenocarcinomas, with 10% constituting sarcomas and lymphoid tumors<sup>[3]</sup>. Biologically, CRC seems to be more aggressive in young men with 61.8% presenting in advanced stage (stages III/IV) at the time of diagnosis. However, the survival rates are similar in both arms of the population owing to fewer comorbidities and better treatment tolerance and performance in the younger population<sup>[5]</sup>. 80% of CRCs are sporadic in nature with genetic susceptibility in 15-20%. Young CRCs include cases with sporadic disease<sup>[4]</sup>.

To integrate fertility preservation into cancer care requires a timely, clear and open communication with patients, counselling of procedures for both cancer and fertility preservation, and the presence of a multidisciplinary oncology and reproductive unit team. This is because lack of information and medical support on the path towards parenthood causes self-reconstruction difficulties in the survivorship period. Patient and treatment factors may influence which preservation options, if any, are most appropriate, taking into account access to services, cancer type and prognosis, oncological treatment protocol and most importantly time to commencement of oncological treatment. Also important for the fertility specialist is to bear in mind the psycho-social issues that arise while counselling these patients. In case of no survivorship, the post-humous storage and use of gametes may involve legalities. A counselling satisfaction and ray of hope to look forward to a new life prevents regrets in the post survivorship period<sup>[6,7]</sup>. The most common reason for failing to bank sperm and the regret of inability to build a family post cancer survival is a lack of awareness that such an option exists. Instead, many patients are left with significant anxieties over reproductive health concerns<sup>[8]</sup>. Sperm cryopreservation is the first-line procedure to preserve fertility in post-pubertal males and multiples samples should be preserved if time permits. Chemotherapy and radiation therapy, can directly damage the germinal epithelium impairing the reproductive function resulting in oligozoospermia or azoospermia. Cytotoxic chemotherapy may also lead to transmission of genetic damage to children conceived post treatment. Oxaliplatin studies in mice have shown transient, moderate reductions of spermatocytes-spermatogonia numbers and spermatozoa motility<sup>[9]</sup>. Radiation therapy is gonadotoxic in a dose-dependent manner and has been shown to damage developing sperm. In the case of gastrointestinal tumors, relative proximity to the reproductive tract is a concern, as radiation used to treat the primary tumor may have deleterious secondary effects on future fertility. Post gonadotoxic therapy, the decision to offer the treatment plan is decided upon the semen quality pre-freeze and post thaw<sup>[9]</sup>. Where adequate vials/ straws of semen samples have been banked, those with adequate semen parameters can be offered IUI while those with poor thaw survivals or low counts or female factor infertility can be offered ICSI<sup>[10]</sup>.

### CONCLUSIONS

Prevention of the second obstacle of life in post cancer survivors can be taken care of by the team approach between the reproductive specialist and oncologists. The gonadotoxic consequences become a major issue several years later in life when a couple plans parenthood. Sperm cryopreservation can be the most reliable and non-invasive method which can help even in the emotional battle against cancer, becoming a new ray of hope. A multidisciplinary approach between oncologists and infertility specialist can go a long way in changing the quality of life of these young rectal cancer survivors.

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