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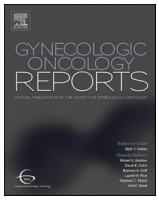

Case report

Pregnancy after sugery and brachytherapy for vaginal cancer

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ABSTRACT

Introduction: Primary vaginal cancer is infrequent, corresponding to 1–2% of all female genital tract cancer diagnoses.
Treatment for vaginal cancer varies depending on tumor histology, size, location and staging, and may include one or more of the following: surgical excision, radiation therapy and/or chemotherapy. All treatments negatively affect fertility/pregnancy outcomes.
Pelvic radiation therapy, even in doses < 2 Gy, may extinguish up to 50% of immature oocytes. In addition, radiotherapy may cause modifications in cervical length, loss of uterine junctional zone anatomy and lead to myometrial atrophy and fibrosis, increasing the risk for adverse pregnancy outcomes.
Methods: Case report of a patient who carried a pregnancy to term after surgery and brachytherapy for vaginal cancer.
Results: A 28 year-old woman, presented with a 3 cm right midvagina wall tumor, diagnosed as grade 2, vaginal squamous cell carcinoma - FIGO 2009, stage IB. Computed tomography showed no evidence of lymph node involvement or distant metastasis. The patient underwent surgery followed by 4 fractions of vaginal brachytherapy, once a week, with a dose of 6 Gy at a 5 mm depth, amounting to a total dose of 24 Gy.
One year and 9 months after treatment, the patient gave birth to a healthy child at 39 weeks pregnancy. A C-section was needed due functional dystocia during labor.
Conclusion: This case report recounts a successful pregnancy carried to term after surgery and brachytherapy for squamous cell vaginal cancer.

1. Introduction

Primary vaginal cancer is defined as a disease found in the vagina with no clinical or histological evidence of cervical or vulvar cancer, and without previous diagnosis of such cancers, accounting for only 10% of malignant lesions found in the vagina and corresponding to 1–2% of all malignant neoplasm of the female genital tract. Vaginal metastasis from cervical, rectal, vulvar, endometrial and other cancers are more frequent than primary vaginal cancer. (Siegel et al., 2014; Adams et al., 2021).

Although most commonly found in postmenopausal women, the incidence of primary vaginal cancer has increased in young women, especially in countries with a high prevalence of HIV/HPV infection. Squamous cell carcinoma is the most frequent histologic type and is associated with persistent high risk HPV infection (subtypes 16 and 18), development of high-grade vaginal intraepithelial lesions (VaIN) and consequent progression to invasive lesions. The risk of progression from high-grade VaIN to cancer varies between 2 and 12%. (Adams et al., 2021; Hodeib et al., 2016).

The treatment for vaginal cancer is often individualized and may include surgery, radiation therapy and concurrent chemotherapy. A full history and general physical examination, as well as imaging techniques such as computed tomography, magnetic resonance imaging, and positron emission tomography may assist in therapeutic planning and treatment selection. (Adams et al., 2021; Lee et al., 2013).

We present a case of a young woman with vaginal cancer treated with local excision followed by brachytherapy, who spontaneously became pregnant, delivered a healthy child, and currently has no evidence of disease recurrence or persistence.

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2. Case presentation

A 28 year-old patient was referred to our hospital due to symptoms of sporadic vaginal bleeding and post-intercourse bleeding as of 2 months prior to referral. She had an obstetric history of a c-section delivery 7 years prior, had had 10 sexual partners and did not use any contraceptive method. Previous exams included a cervical-vaginal cytology negative for neoplasia and a vaginal biopsy with the histological diagnosis of high-grade vaginal intraepithelial neoplasia.

Upon pelvic examination, the vulva was normal. However, an exophytic lesion, measuring approximately 4 cm and located on the right lateral vaginal wall, midvagina, with apparent superficial mucosal infiltration was noted. The uterine cervix was epithelialized with normal appearance and with no macroscopic lesions. The parametria were apparently free from neoplastic involvement bilaterally and no enlarged inguinal lymph nodes were observed.

A second excisional biopsy of the vaginal lesion was performed during examination, which confirmed the histopathological diagnosis of squamous cell carcinoma. Computed tomography of chest-abdomen-pelvis was performed, with no evidence of metastatic lesions or lymphadenopathy.

After a multidisciplinary tumor board, taking into consideration the non-infiltrative aspect of the tumor, a decision was made to perform local surgical resection. The patient underwent partial colpectomy, performed vaginally, and the surgical specimen displayed a grade 2, squamous cell carcinoma, with 3.2 cm extension, infiltrating 10 mm of the vaginal wall with free margins.

After another round of multidisciplinary discussion, it was recommended that the patient should undergo adjuvant brachytherapy. The absence of suspicious lymph nodes and the complexity of lymphatic drainage of the middle third of the vagina were taken into consideration to come to this decision. Brachytherapy was performed, using a 35 mm cylinder, encompassing 7 cm of the vagina once a week, 6 Gy per fraction. Total radiation dosage amounted to 24 Gray, calculated for 5 mm depth, divided among 4 sessions.

After brachytherapy, the patient reported irregular menses, once every 3 months. Nonetheless, one year after treatment, she became pregnant. At 39 6/7 weeks, a healthy 3,320 kg baby was delivered, with Apgar scores of 5 and 9. A C-section was needed due functional dystocia during labor. After 9 years of follow-up the patient remains cancer free and her child is healthy.

3. Discussion

This case describes the successful treatment of vaginal cancer in a young woman with a spontaneous pregnancy and labor at term, with no complications during pregnancy, and the delivery of a heathy child.

Primary vaginal cancer is rare, treatment is often individualized and great part of the disease's management is extrapolated from cervical cancer guidelines. Treatment may include surgery, radiation and concurrent chemotherapy. When surgical excision is preferred, iatrogenic damage to neighboring structures such as the bladder and rectum are described, while radiation, or a combination of surgery and radiation may lead to vaginal stenosis, as well as associated dyspareunia due to decreased vaginal size. These issues should be taken into consideration when defining treatment. Furthermore, surgery has a minimal role in the treatment of this cancer because of the necessary radicality to achieve free margins. Still, in selected cases, surgical resection may be an option. Fertility preservation is not mentioned in the few available guidelines. (Adams et al., 2021).

Regarding preservation of ovarian function in young women, it is known that pelvic radiation therapy, even in doses < 2 Gy, may extinguish up to 50% of immature oocytes. (Wallace et al., 2003) Literature on this topic is very scarce. However, current evidence suggests that radiation affects uterine anatomy by damaging the myometrium, the endometrium, as well as reducing uterine perfusion, thus provoking lower fecundity rates and a higher incidence of adverse pregnancy outcomes including miscarriage, pre-term delivery, low birth weight, and perinatal death. (Teh et al., 2014; Milgrom et al., 2013). Radiation doses of < 4 Gy do not appear to impair uterine function. Additionally, reports of successful pregnancies after treatment with pelvic radiation are extremely rare. (Browde et al., 1986; Plante et al., 2011 Nov).

It is important to highlight the fact that brachytherapy alone is rarely used in the absence of external radiotherapy for the treatment of gynecologic malignancies, especially in patients in which the uterus was spared and of childbearing age. (Adams et al., 2021; Morice et al., 1998) Pregnancy after brachytherapy is very rare, probably because of the side effects related to the treatment such as cervical stenosis and endometrial atrophy. We found very few reports on fertility after treatment for vaginal cancer and none for squamous cell carcinoma. One particular study assessed fertility outcomes in patients with clear cell carcinoma of the cervix/vagina who had undergone ovarian transposition before radiation. (Morice et al., 1998) This study showed that the endometrium preserved some of its function despite the locoregional radiation treatment.

The functional dystocia presented during labor in this case could be a consequence of cervical fibrosis caused by brachytherapy, since radiation exposure results in reduced uterine volume and myometrial elasticity (Plante et al., 2011 Nov). Yet, there are several other causes of functional dystocia which we cannot exclude due to poor recording on the patient's medical charts.

Whether or not to perform lymphadenectomy is another point of debate since the lymphatic drainage of the vagina is complex. The lower third of the vagina drains to inguinal lymph nodes, while the upper third drains to pelvic lymph nodes, including the obturator, internal and external iliac nodes. Cancer in the midvagina may spread to both pelvic and inguinal lymphatic routes. In addition, there is little information on the incidence of lymph node metastases in vaginal cancer. Medical literature showed lymph node involvement in 28% to 42% of primary vaginal cancer cases, including all cancer stages. (Adams et al., 2021; Morice et al., 1998) During discussion at our institution's tumor board, there was controversy amongst colleagues regarding the performance of complete lymphadenectomy vs. sentinel lymph node mapping vs. surveillance in this case. The complexity of the lymphatic drainage of the middle third of the vagina and the fact that primary resection had already occurred at the time of the discussion provided additional controversy. At this point, discussion on lymph node resection was based on 2 main facts: first that surgery could cause subsequent modification of regional lymphatic drainage and second that physical examination and imaging did not indicate suspicion of lymph node metastasis. There was consensus regarding adjuvant brachytherapy as reasonable option to increase locoregional control of the disease.

This case report presents a promising aspect of vaginal cancer treatment, especially considering its rarity and is an interesting topic for future discussion. We also recommend that, given the infrequency and need for individualized management for this type of tumor, women diagnosed with primary vaginal cancer should be referred to a cancer center if possible.

Ethics approval

This study was approved by the research ethics committees of Instituto Brasileiro de Controle do Câncer (reference number 5.836.399). Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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