CLINICAL CASE OF SUCCESSFUL APPLICATION OF PHOTODYNAMIC THERAPY IN ADVANCED VULVAR CANCER

Shanazarov H.A.[1], **Grishacheva T.G.**[2], **Aldabergen G.S.**[1], **Smailova S.B.**[1], **Salmaganbetova Zh.Zh.**[1]

[1]Medical Center Hospital of the President's Affairs Administration of the Republic of Kazakhstan, Astana, Republic of Kazakhstan

[2]First St. Petersburg State Medical University named after I.I. acad. I.P. Pavlova, St. Petersburg, Russia

Abstract

A significant therapeutic effect of photodynamic therapy (PDT) is shown in a patient with extensive vulvar cancer after ineffective surgical and chemoradiotherapy. During the year, three courses of local PDT with a photosensitizer based on chlorin e6 were carried out. The photosensitizer was administered intravenously three hours before irradiation at a dose of 1.2 mg/kg. For laser irradiation (662 nm) of the vulvar tumor, a light guide for external irradiation was used: the power density was 0.2 W/cm^2, the light dose was from 100 to 250 J/cm^2. As a result of treatment, tumor regression and stable remission are observed. The patient remains under observation.

Key words: vulvar cancer, local photodynamic therapy, clinical case, photolon.

Contacts: Aldabergen G.S., e-mail: gulmira.aldabergen@mail.ru

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КЛИНИЧЕСКИЙ СЛУЧАЙ УСПЕШНОГО ПРИМЕНЕНИЯ ФОТОДИНАМИЧЕСКОЙ ТЕРАПИИ ПРИ РАСПРОСТРАНЕННОМ РАКЕ ВУЛЬВЫ

Н.А. Шаназаров[1], **Т.Г. Гришачева**[2], **Г.С. Алдаберген**[1], **С.Б. Смаилова**[1], **Ж.Ж. Сальмаганбетова**[1]

[1]Больница Медицинского Центра Управления Делами президента Республики Казахстан, Астана, Республика Казахстан

[2]Первый Санкт-Петербургский государственный медицинский университет им. акад. И.П. Павлова, Санкт-Петербург, Россия

Резюме

Показан значимый лечебный эффект фотодинамической терапии (ФДТ) у пациентки с обширным раком вульвы после малоэффективной оперативной, химиолучевой терапии. В течение года проведено 3 курса локальной ФДТ с фотосенсибилизатором на основе хлорина е6. Фотосенсибилизатор вводили внутривенно за 3 ч до проведения облучения в дозе 1,2 мг/кг. Для лазерного облучения (662 нм) опухоли вульвы использовали световод для наружного облучения: плотность мощности составляла 0,2 Вт/см^2, световая доза от 100 до 250 Дж/см^2. В результате лечения наблюдается регрессия опухоли и стойкая ремиссия. Пациентка остается под наблюдением.

Ключевые слова: рак вульвы, локальная фотодинамическая терапия, клинический случай, фотолон.

Контакты: Алдаберген Г.С., e-mail: gulmira.aldabergen@mail.ru

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Introduction

Today, the frequency of precancerous diseases of the female external genitalia is one of the most pressing problems of the female population. According to WHO, 46% of premenopausal women worldwide have dystrophic diseases of the vulva, which, against the background of positive HPV, can develop into dysplasia and then into pre-invasive and invasive vulvar cancer [1, 2].

Diagnosis of precancerous diseases of the female external genitalia is based on anamnestic data and examination with a colposcope – vulvoscopy – which allows one to determine the boundaries of pathologically altered tissues [3]. Final confirmation of the diagnosis is possible after cytological and histological conclusions [4]. The reliability of the cytological method in determining the severity of vulvar intraepithelial neoplasia is low due to concomitant severe inflammation, hyperkeratosis and atrophy. Histological examination is performed in the presence of complaints and visually detectable pathological changes [5-7].

The frequency of vulvar cancer in the general structure of gynecological oncological diseases is 4-6% of all cancer cases and is detected in 2-4 women per 100,000 population. About 4 out of 10 women who develop vulvar cancer die. The overall 5-year survival rate for all patients with vulvar cancer is 72% [6].

The main management strategy for patients with vulvar cancer is surgical treatment. [8-11]. Chemoradiotherapy is indicated in unresectable cases of vulvar cancer. Treatment in this case is aimed at slowing the progression of the disease and reducing the tumor mass. In some cases, radiation and chemotherapy may precede surgery, allowing to reduce the tumor size, which creates the background for radical surgery. For the same purpose, it is possible to carry out photodynamic therapy (PDT), which has proven to be an effective method for treating tumor diseases [9, 10].

We present a clinical case of PDT application for advanced vulvar cancer.

Patient G., 65 years old, applied to the PDT Center of the Hospital of the Medical Center of the Presidential Administration of the Republic of Kazakhstan, Astana in September 2022 with complaints of a formation in the vulva and vagina, pain in the vagina, occasional "shooting" pain in the area pubis, and discomfort when walking.

The patient was observed and treated at the place of residence with a diagnosis of malignant neoplasm of the vulva of an unspecified part (TIbN0M0), clinical group 3. Concomitant pathology: insulin-dependent diabetes mellitus, varicose veins of the lower extremities, chronic venous insufficiency class 2.

From the anamnesis it is known that in 2018 vulvectomy was performed; in 2020, due to the instability of the oncological process, a Ducuing operation on the right and left and a radical vulvectomy were performed; in 2021, a locoregional recurrence was detected, and radiation therapy was carried out according to a radical program, using the TERAGAM device in statistical mode with counter-propagating fields on the tumor of the vulva and areas of regional metastasis with a single focal dose of 2 Gy and a total focal dose of 40 Gy.

In 2022, metastatic lesions of the vagina and regional lymph nodes were identified, four courses of palliative chemotherapy (PCT) (ondasetron, paclitaxel, cisplastin) were performed without effect. Since August 2022 there has been an extensive vaginal formation, according to biopsy it is a morphologically squamous cell keratinizing carcinoma, progression.

On vaginal examination revealed that the external genitalia are scarred and atrophic; vagina is short and narrow; in the mirror a dense woody formation with a diameter of 5.0×5.5×4.0 cm is visualized on the left from the edge to the vaginal vault; in the middle there is a purulent ulcer with a dense yellow coating (Fig. 1a). The secretion is serous, with a putrid odor; the cervix is atrophic; the edge of the cervix is tightly covered by the formation, visualization is difficult, and bimanual examination is difficult due to pain and the presence of a volume vaginal formation.

Clinical diagnosis: vulvar cancer T1bN0M0; condition after surgical treatment; recurrence in 2021; condition after external beam radiation therapy (EBRT); condition after 4 courses of chemotherapy; recurrence of vulvar cancer; local chemotherapy in the process.

The patient's treatment tactics were discussed by a multidisciplinary group. Taking into account the localization of the tumor and the lack of response to chemoradiotherapy, a decision was made to perform local PDT.

Upon admission, the patient's condition was satisfactory. The patient signed a voluntary informed consent for PDT.

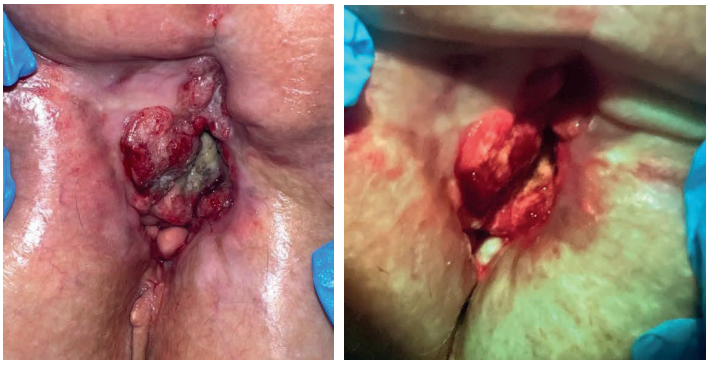
The first course of PDT was conducted on September 5, 2022.

Operation protocol:

Stage 1: intravenous administration of a photosensitizer (PS) based on chlorin e6 (Photolon) at a dose of 1.2 mg/kg. The calculated dose of the drug was dissolved in 200 ml of 0.9% physiological solution and administered over 30 minutes.

Stage 2: fluorescence diagnostics (FD). Three hours after the end of intravenous administration of PS, FD was performed using a LED illuminator "LED physiotherapy device" (Polironic, Russia) in the wavelength range 400±10 nm. When irradiated in this spectral wavelength range, the accumulation of PS in the tumor was recorded and the boundaries of the pathological focus were determined (Fig. 1b).

Stage 3: PDT. Under local anesthesia, local PDT was performed by irradiating the vagina using a Lakhta Milon laser device (Kvalitek LLC, Russia) at a wavelength of 662



a b

Рис. 1. Рак вульвы T1bN0M0 (состояние после оперативного лечения в 2018 и 2020 г., после ДЛТ и 4 курсов ПХТ без эффекта): a – осмотр в белом свете; b – осмотр в режиме флуоресценции.
Fig. 1. Cancer of the vulva T1bN0M0 (status after surgical treatment in 2018 and 2020, after radiotherapy and 4 courses of chemotherapy without effect): a – examination in white light; b – examination in fluorescence mode.

a b

Рис. 2. Состояние вульвы через 3 мес после 1-го курса ФДТ: a – осмотр в белом свете; b – осмотр в режиме флуоресценции.
Fig. 2. Condition of the vulva 3 months after the 1st course of PDT: a – examination in white light; b – examination in fluorescence mode.

Рис. 3. Состояние вульвы после 3-го курса ФДТ.
Fig. 3. Condition of the vulva after the 3rd course of PDT.

nm in a continuous mode of generation. Irradiation parameters: diameter of the irradiation field – 2.5 cm; power 1.9 W; power density – 0.38 W/cm^2; exposure of one field – 9 min; light dose – 200 J/cm^2; number of fields – 7. The procedure was accompanied by moderate pain. In satisfactory condition, the patient was discharged for ambulatory observation by a gynecological oncologist at the place of residence. The observance of light conditions is recommended to the patient.

In the postoperative period, moderate pain was observed, which required the use of local application of oflomelid ointment and systemic use of non-steroidal anti-inflammatory drugs. Local swelling and hyperemia were noted. After 7-10 days, tumor necrosis formed.

During a follow-up examination one month after the 1st course of PDT, partial destruction of the tumor was noted.

In December 2022, taking into account the partial preservation of the tumor process, it was decided to conduct the second course of PDT. The operation protocol was the same as during the first course. The condition of the vulva and fluorescent glow before PDT are shown in Fig. 2.

In May 2023, the third course of PDT was performed. During a year, it was possible to restrain tumor growth through multi-course treatment. At the moment, the patient's condition is stable. Figure 3 shows the result after the third course of PDT.

Today, in the treatment of precancerous conditions of the female external genitalia, treatment with local PDT plays a significant role [12-17].

In the presented clinical case, local PDT was performed and stabilization of the tumor process was achieved during the treatment. The prognosis for the patient is favorable.

Thus, the use of the PDT method can be used in combination with other methods to increase clinical effectiveness. This determines the relevance of the development of this method in the treatment of oncological and dysplastic diseases of the vulva.

Conclusion

The above clinical case suggests that for patients with the recurrence of the vulvar cancer and ineffectiveness of chemoradiotherapys, PDT allows to achieve a significant regressive effect and stabilize the tumor process.

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