

THE PLACE OF INTERSTITIAL TREATMENT IN THE MANAGEMENT OF VULVAR CARCINOMA

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ABSTRACT

In this paper a review of the role brachytherapy in the treatment of vulvar cancer is presented. Although external beam irradiation has been the most commonly method used in patients with vulvar malignancies not suitable for surgery, there has been increasing interest in using brachytherapy instead of or combined with teletherapy. Issues such as patients selection, interstitial techniques, integration with other local therapies and complications are highlighted.

Key words: Vulvar carcinoma, brachytherapy

Carcinoma of the vulva accounts for 2.5 - 4.0% of all gynecological neoplasms. The incidence in Poland is 1-2 per 100 000 women with tendency of increasing rates in older age (Tarlowska 1983). Traditionally, the standard treatment for invasive carcinoma of the vulva has been radical vulvectomy with bilateral inguinal lymph node dissection. Radiation therapy has for long been considered to have a limited role in primary management of vulvar cancer because of the belief that the vulva and perineal tissues tolerate radiation therapy poorly. Also, the results of radiotherapy alone as primary treatment seems to be inferior to surgical methods. That was mainly caused by selection of patients treated by irradiation with poor prognostic features (Miecznikowski 1993). Primary radiotherapy has been often used in cases with fixed tumors positive inguinal or in frail patients. The advent of megavoltage external beam equipment, integration of external beam and brachytherapy and individualization with good treatment planning have improved tolerance of radiotherapy and are essential to achieve a better cure rate. The reappraisal of radiotherapy has led to new strategies for early disease using less radical surgery in combination with radiotherapy with preservation of function and cosmesis in the treatment of vulvar malignancies. Also, for advanced vulvar carcinomas the radiotherapy may be a reasonable alternative to exenteration (Snijders-Keilholz 1993). The aim of is study was a short review of eight decades of brachytherapy in the treatment of the carcinoma of the vulva.

Interstitial implantation in the treatment of vulvar malignancies were used as early as 1914. Radon 222 with a half-life of 3.82 days

was the first radioisotope used for permanent implants (cit. Erickson 1996). The glass seeds of radon were manually implanted in the vulvar and perineal tissues. This procedure was subsequently abandoned because of the painful reactions that developed at the implantation place from the emitted beta rays and poor five year survival. In the 1920 gold filtered radon seeds with minimal beta rays emission were introduced and replaced the glass seeds (Perez 1992). In the following years this procedure, often combined with external beam irradiation, has been used in the treatment of vulvar cancer usually with palliative intent. The sources were inserted in and around the tumor to give a dose of 100 mCi/hr. A wide variety of encapsulated radioactive sources have been used in brachytherapy of the vulvar cancer since first clinical applications of radon seeds.

Radium needles containing radium sulfate with filler (barium sulfate) replace radon seeds. Needles with 1.0 mg Ra/cm or 0.5 mg Ra/cm were initially constructed with steel walls with high emission of beta rays (Perez 1992). Replacement steel walls by iridioplatinum walls which absorbed the beta rays responsible for the painful necrosis allowed to improve the tolerance of the intersitial irradiation. Single or double plane platinum filtered radium needle implants which deliver to 60 Gy during five to seven days were used. According to Ellis (1949), 18 % of patients treated by radium were free of disease 5 years after treatment. Cade and Lederman (1950) recommended implantation of 6 cm long, low-intensity (0.66 -2 mg radium per needle) needles for unresectable vulvar cancer. Four of 12 patients treated in this way remained free of tumor relapse with follow

up from 4 to 10 years. Tod and Paterson (1948) used single or doubleplane radium needle implants often with crossing sources instead of teletherapy for vulvar neoplasms if surgery was not possible. For the entire group of 116 patients treated by them between 1932-1941, 21% were free of disease five years after treatment (33% of early cases and 14% of late cases). The inguinal lymph nodes were sometimes implanted by them, but the results of treatment were extremely poor and surgical extirpation or external beam irradiation was recommended. Slevin and Pointon (1989) obtained a 40% local control rate and a 26% crude five year survival rate in 58 patients with advanced vulvar lesions. There was a suggestion that better local control was observed in patients with tumors 4 cm or less in diameter. Minor radionecrosis appeared in nine cases. Rutledge (1965) suggested the use of radium needles in the place of incomplete excision of vulvar lesions. In his opinion the tolerance of radium implants were better than external radiation. Occasionally radium implants alone were used in the treatment early lesions mainly in patients with poor operative risk. Radium interstitial irradiation was regarded as equally effective as surgical procedure for early lesions. But the complication rate, particularly radionecrosis was high and limited this procedure in daily practice. In Ellis series thirty three cases of necrosis were observed in 103 patients who received same form of radiation (Ellis 1949).

The most authors reported the use of platinum filtered radium needle implants for unresectable primary or recurrent disease. In 21 patients with recurrent carcinoma of the vulva treated by brachytherapy combined with external irradiation Prempre and Amornman (1984) found that 6 with tumor limited to the perineum, vagina or both had tumor control and survived 5 years. However, none of the patients with extensive recurrences survived, although some had transient tumor regression. Additionally to brachytherapy, the use of external irradiation (40 - 50 Gy/g) was recommended for all advanced lesions, all postoperative recurrences and all cases with inguinal lymph node metastases. The brachytherapy doses were 20 - 30 Gy during one to two days. Usually, radium implantations were performed in accordance with Paterson-Parker rules. According to Prempre and Amornman (1984), Factors responsible for the success of radiation therapy of the vulvar carcinoma appear to include size and depth of recurrence (5cm or less lesion has a high

chance for cure); groin node (less than or equal to 2 cm has good prognosis ; perineal skin involvement (the smaller, the better); degree of tumor necrosis (the smaller, the better) and radiation dose (55 - 85 Gy).

Cesium needles with 0.66 and 0.33 mg Ra/cm commonly used for interstitial implants, in the treatment vulvar lesions were used very rarely (cit. Erickson 1996). Radium and cesium needles implantation techniques were limited by the stock of various lengths and strengths which were available. The longest active length of radium needle was 6 cm. Longer needles were too brittle for insertion. Iridium 192 was available in a much greater range of lengths and activities and was much narrower in diameter. Free-hand or template-guided techniques have been used to perform insertion. The template-guided procedure allow to get a more predictable distribution of needles than possible with free-hand techniques. Iridium 192 has been used increasingly since 1958 (Perez 1992). Cuccia (1966) reported the use of iridium for vulvar lesion that exceeded the maximum length of the radium needles available. Hollow needles were inserted first and next manually afterloaded with iridium. Pohar et al (1995) accumulated a large experience at the Centre Alexis Vautrin in Nancy (in France). These authors reported use of free-hand iridium implantations in plastic tubes in 34 patients treated between 1975-1993. Twenty one patients were treated because of primary tumor when surgery was contraindicated and 13 patients were treated for recurrent disease. If tumor thickness was less than 1.5 cm interstitial irradiation was used alone. If thickness cross this value, external beam irradiation followed by brachytherapy was recommended. The single-double or triple plane implants were performed according to the Paris system rules. The average brachytherapy dose was 60 Gy prescribed to the reference isodose. Locoregional recurrences developed in three of 21 patients treated for primary carcinoma of the vulva and in eight of 13 patients treated for recurrent disease at a median follow-up of 31 month. The toxicity of the treatment was low. Authors concluded that brachytherapy may be reasonable alternative method to surgery, particularly when surgical procedure is contraindicated and for recurrent disease. Carlino et al (1984) reported use perineal templates (the Syed-Neblett template) through which steel needles were inserted and next afterloaded with Ir 192 combined with or without surgery or external beam irradiation. The best results were achieved when surgery and brachytherapy were

jointed compared to brachytherapy with teleradiotherapy (72% vs 25% free of disease at five years). Martinez et al (1983) described the use of iodine 125 or iridium 192 interstitial implants in the treatment 35 patients with perineal malignancies. Implantation was usually performed to treat evident or microscopic disease in conjunction with external beam pelvic treatment with or without local excision. The overall local control rate was 88%. 27 patients are alive and free of disease from 37 to 76 months. At Memorial Sloan Kettering, the use of interstitial irradiation alone in the treatment of the carcinoma of the vulva was advocated for patients with small primary tumors who were medically inoperable (Nori 1987). Brachytherapy combined with external beam was recommended for patients with large inoperable or recurrent lesions if there was substantial regression of disease with teletherapy. Dose rates of 4.0 to 8.0 Gy/hr were recommended to deliver a minimum 60 Gy when brachytherapy is used alone or 30 - 40 Gy as a boost following external beam doses of 40 to 50 Gy/tumor. Perez et al (1993), Rush et al (1992) recommended brachytherapy as a boost (10 - 20 Gy) to the tumor or excision site following external beam irradiation with excellent tumor control. Hockel and Muller (1991) have also treated primary and recurrent vulvar lesions with perineal template but used high-activity Ir 192. The ability of brachytherapy using high activity iridium 192 to control squamous cell carcinoma of the vulva was documented by Batterman (1992).

There is common that interstitial implantation was highly effective but highly morbid method. The toxicity rate was higher in patients with brachytherapy doses more than 60 Gy. Hoffman et al (1990) treated ten patients with locally advanced cancer with brachytherapy alone or combined with external beam irradiation. The local control was obtained in 7 patients. They remain free of disease at a median follow-up of 28 months. Radionecrosis developed in six patients at a average time of 8.5 months after radiotherapy. Five of them required wide excision and coverage with flaps.

CONCLUSION

Brachytherapy offers properly selected patients an innovative alternative to radical surgery with the excellent local control. The use of interstitial irradiation as a boost in combination with external beam irradiation has enabled a reduction in the dose from teleradiotherapy, causing less toxicity of the treatment with good

macroscopic and microscopic control of disease.

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