Cisplatin Pasting for Radiotherapy of Penile Cancer

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OKUYAMA, S., SUZUKI, Y, and KATO, M. Cisplatin Pasting for Radiotherapy of Penile Cancer. Tohoku J. Exp. Med., 1994, 172 (4), 385-387 A case of penile cancer (Jackson's stage II) was treated with cisplatin pasta along with radiotherapy. The cancerous masses dissolved by the time of 27 Gy (913 ret) of radiotherapy, and the initial plan of penile amputation was abandoned. This cisplatin pasting would probably be a useful technique in radiotherapy of penile cancer, preserving the function of the organ. Cisplatin pasta; penile cancer; radiotherapy

Radiotherapy of penile cancer has to be designed so as to conserve not only its morphology but also sexual and micturition functions. However, radiotherapy itself suffers from a probabilistic limitation, and cancerous residuals as well as cancer metastases are probable even when penile amputation and bilateral inguinal lymphatic dissection are carried out. Cisplatin pasting radiotherapy was carried out on a 60-year-old man who presented himself with a penile cancer of the coronary sulcus infiltrating the proximal portion of the shaft (Fig. 1A). Its histopathological diagnosis was squamous cell carcinoma at Jackson's stage II (Fig. 2A). When referred for possible radiotherapy, he had already been subjected to bilateral inguinal lymphatic dissection whose histopathological results were negative for signs of cancer spread. Cisplatin pasta was prepared by placing 300 mg of polyacrylate sodium onto the surface of a 10 ml aliquot of cisplatin solution at 0.5 mg per ml for hours during which time the latter diffused down to form adhesive pasta (Okuyama and Mishina 1992). The pasta was applied just before each session of radiotherapy. An 8 × 8 cm field of radiotherapy was placed upon the entire penile shaft. A fractional dose of 1.5 Gy of gamma ray at 2 cm was given him from a telecobalt unit. Concomitantly, 50 mg t.i.d. of 5-fluoro-uracil was administered orally. Peroral administration of cytochrome c preparation was also carried out at 10 mg t.i.d. (Cytorest, Mochida, Tokyo).

The tumor responded well to the pasting chemoradiotherapy, and had been dissolved by the time 27 Gy (913 ret) was reached (Fig. 1B). Histological studies revealed elimination of cancer cells (Fig. 2B). Thus, the present cisplatin pasting radiotherapy was found effective in eradicating cancer cells. However, the patient suddenly expired from rupture of the esophageal varices due to liver cirrhosis 3 months after completion of that treatment. There were no conceivable immediate indications for correlation of cisplatin impregnation to the rupture. Autopsy was declined.

A cancer of the penis at stage II was dissolved by a low dose radiotherapy as low as 913 ret when combined with topical cisplatin pasta. This technique seemed to have a

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Fig. 1. Cisplatin pasting for radiotherapy of penile cancer.
A: A penile cancer at Jackson's stage II before treatment. State immediately after systemic bleomycin. The prepuce was cut by a circumcision, and cancer infiltrating the proximal shaft was exposed, although the glans penis appeared intact yet. As bilateral inguinal biopsy turned out negative for lymphatic involvement, we thought penile amputation would be avoided. Direct impregnating chemoradiotherapy was planned with cisplatin pasta. B: Tumor dissolution at the time of completion of pasting chemoradiotherapy to 27 Gy in 18 sessions (913 ret). The brilliant reddish pigmentation was correlated with the cytochrome c rescue therapy of radiation dermatitis (Okuyama and Mishina 1982, 1990).

Fig. 2. Cisplatin pasting for radiotherapy of penile cancer.
A: Penile cancer before treatment as of December 7, 1992. Squamous cell carcinoma invading the epidermis and subcutis. B: Cancer cells were eliminated as of February 10, 1993, 3 weeks after cessation of the treatment. Histological changes of treatment-related inflammation were persistent.
potential of overcoming the probabilistic barrier of cell killing of radiotherapy and chemotherapy. That topical application of cisplatin pasta may have the benefit of avoiding systemic adverse effects of nausea and vomiting, renal and hematopoietic toxicity from the systemic doses of cisplatin. The patient experienced least nausea and vomiting or marrow toxicity not greater than that ascribable to radiotherapy alone. There were no definite adverse changes to serum electrolyte levels or parameters of renal integrity. But for the history of prior bleomycin therapy, bleomycin pasta could have also been applied to him (Okuyama and Mishina 1992).

There are no reports of direct application of cisplatin in solution or pasta or ointment but ours: aerosol (Okuyama et al. 1993) and pasta (this paper). Usefulness of topical application of bleomycin ointment has been known: a larger radiation dosage of 50 Gy plus tumorectomy (Fukutani et al. 1887) or additional systemic bleomycin and penile amputation (Uchida et al. 1992) presumably so as to overcome the probabilistic barrier of cell killing of such treatments.

Radiation dermatitis was alleviated by peroral dispense of cytochrome c preparation (Okuyama and Mishina 1982, 1990). Thus, cisplatin pasting radiotherapy of penile cancer can be curative without resorting to amputation, and this therapeutic principle may deserve thorough clinical investigation.

References