

CASE REPORT
COMBINED RADIO-THERMO-THERAPY
FOR BLADDER TUMOR

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In recent years, hyperthermia has attracted a renewed interest in the treatment of malignant diseases^{1,2}. Cancerocidal effect of heat differs from that of ionizing radiation in many respects^{3,4}. For instance, (1) radioresistant S-phase cells are more efficiently killed by hyperthermia because heat sensitivity is less dependent on cell cycle in comparison with radiation, (2) radioresistant hypoxic cells are more vulnerable to heat treatment, (3) heat can inhibit the repair of sublethal and potentially lethal damages by radiation. Since these characteristics supplement the effect of ionizing radiation, many trials of combined radio-thermo-therapy are going on now. At present, difficulty in heat production and thermal dosimetry in the deep seated tumors limits the clinical application of this method to the tumors arising from particular sites. For superficial tumors, such as cervical node metastasis and skin malignancies, micro-wave and hot pack are suitable method⁵. Among deep seated tumors, bladder tumor can be heated easily by irrigation of hot water⁶. The purpose of this paper is to present the case histories of 2 patients with bladder tumor treated by irradiation combined with hot water irrigation.

METHODS

Bladder region was irradiated with a daily dose of 200 rad of 6 MV X-ray through 3 portals. Considering the heat enhancement to normal vesical mucosa, we planned to deliver a total dose ranging from 4000 rad to 4500 rad.

Within 30 minutes after irradiation, the bladder was irrigated slowly with 1000 ml of hot water through 3 way balloon catheter (Fig. 1). The temperature

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of the water ranged 48°–52°C at the inlet and 40°–42°C at the outlet. Exactly speaking, our trial was radio-thermo-chemo-therapy, because 30 mg of Bleomycin was added to the water by urologist's request.

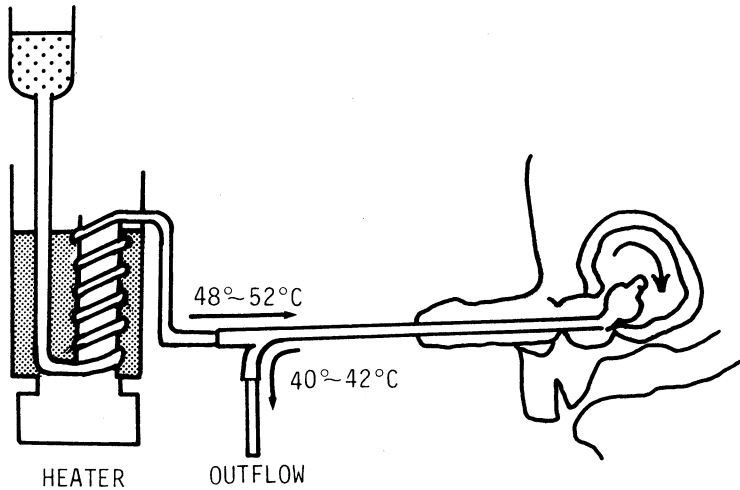


Fig. 1. Diagrammatic representation of the method of bladder irrigation

CASE REPORTS

Case 1. 60 year-old male

Since August 1977, he suffered from benign prostatic hypertrophy. In February 1978, a bladder tumor (T₁N_xM₀) was found by cystoscopy, which

M.H. 63 MALE BLADDER TUMOR
TRANSITIONAL CELL CARCINOMA III

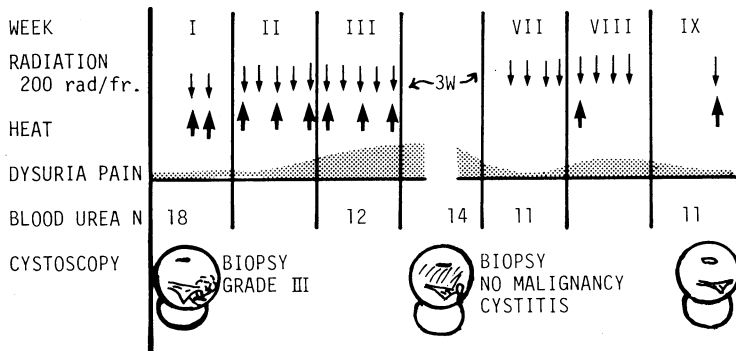


Fig. 2. Course of the treatment Case 1

was diagnosed as transitional cell carcinoma grade III by histological examination. Radio-thermotherapy was initiated on April 6, 1978. Fig. 2 shows the progress of the treatment. Hot water irrigation was carried out each time after the first 2 irradiation. Afterwards, the frequency of irrigation was reduced to once every two times of irradiation. After 7 irradiations and 5 irrigations, the treatment was interrupted because of symptoms of bladder irritation, such as severe miction pain and pollakisuria. Cystoscopic examination revealed marked regression of the tumor and severe hyperemia of mucosa at the same time. After a rest period of 25 days, the treatment resumed and the total dose of 4200 rad with 10 times of irrigation was delivered. Fig. 3 and 4 show the double contrast cystogram of the patient before and after the treatment. The bladder tumor disappeared completely and the patient is living at present without any sign of recurrence.

Case 2. 81 year-old male

He was referred to our department because of the recurrent bladder tumor on March 25, 1978. Pathological diagnosis was transitional cell carcinoma grade III. Fig. 5 shows the course of the treatment in this patient. Symptoms of bladder irritation and the elevation of blood urea nitrogen level were



Fig. 3. pretreatment radiograph



Fig. 4. Posttreatment radiograph (4200 rad and 10 irrigation)

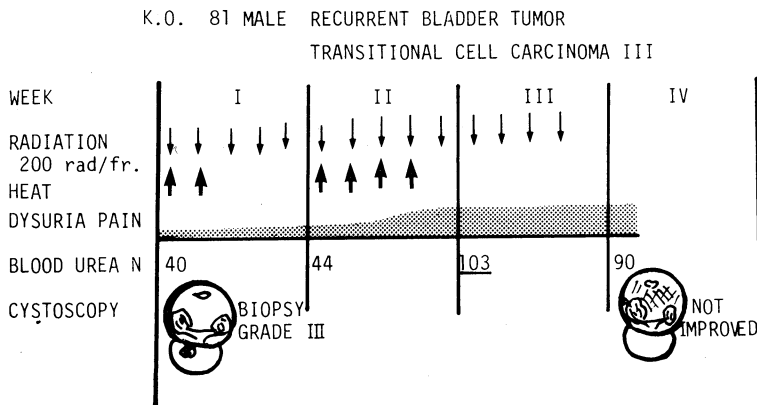


Fig. 5. Course of the treatment Case 2.

encountered after the administration of 1400-1600 rad and 4-5 times of irrigation. Radio-thermo-therapy was discontinued after irradiation with a total dose of 2800 rad and 6 irrigations. Cystoscopy at the end of the treatment

revealed severe cystitis but no remarkable regression of the tumor.

DISCUSSION

We cannot afford any conclusive statement on the efficacy of combined radio-thermo-therapy for bladder tumors because of the limited number of the patients, however a marked regression of the tumor, which was observed in case 1, was never encountered among patients treated by radiation alone with a dose of 4000 rad, so far we are concerned. Hot water irrigation can be regarded as an effective method to enhance the effect of radiation to bladder tumors, however the indication of this method will be limited to the superficial tumor considering the penetrating ability of the heat. Beside the sensitizing effect to the tumor, hot water irrigation enhances the reaction of the normal vesical mucosa at the same time. Since the real value of the combined therapy should be evaluated on the basis of beneficial and adverse effects, or therapeutic ratio⁷⁾, further experience will be necessary to determine the role of radio-thermo-therapy in the treatment of bladder tumors.

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