HEMATOPORPHYRIN DERIVATIVE (HpD) AND LASER PHOTORADIATION
IN THE DIAGNOSIS AND TREATMENT OF BLADDER CANCER

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Administration of hematoporphyrin derivative (HpD) which is a tumor-specific photosensitive substance, followed by irradiation with light is a rapidly developing technique in the diagnosis and treatment of cancer. In this method lasers are used as the exciting light to induce photochemical reaction as they are convenient to use with endoscopic systems.

Cancer are localized by emission of fluorescence induced with violet light from a krypton-ion laser, while in photoradiation therapy (PPT) cancer cells are destroyed by red light from an argon-dye laser.

We investigated this system in 20 patients with malignant bladder tumors.
PRT obtained complete remission in 11 patients with follow-up from 12 to 34 months. Recurrence was seen in 9 patients.

Hematoporphyrin derivative (2.5-5.0 mg/kg body weight) was injected intravenously 48 to 96 hours before scanning for fluorescence detection or therapy.

The laser beams were delivered via a quartz fiber inserted through the device for inserting a ureter catheter of a cystoscope. The fiber tip was positioned 1-2 cm from the bladder wall. The power of the violet beam at the tip of the fiber was 50-100 mW. And the power of the red light at the tip of the fiber was 100-400 mW. and the spot size at the tumor site was 1.0 cm. Treatment time was 20 minutes.

Fluorescence was seen in all cases radiated with violet light. Following PRT with red light the radiated tumor soon
swelled and became edematous. The surface of the tumor was
destroyed in 7-14 days and was replaced with a whitish necrotic
mass. The mass gradually exfoliated and diminished in size,
and the tumor completely disappeared in 4-10 weeks.

PRT is absolutely indicated for tumors in which histopathologic
finding suggest up to a depth of pT1b and invasion it can be
effective to destroy some tumors up to pT2 if they are in a
shallow part of the tunica muscularis. However tumors with
invasion as far as pT3 or deeper do not appear treatable by PPT
alone.

The result suggests that this method is effective in cases of
bladder tumors with invasion up to a depth of pT1b and cases up
to pT2.