HPD AND LASER FOR ESOPHAGEAL AND GASTRIC CANCER

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INTRODUCTION

Photoradiation therapy (PRT) using hematoporphyrin derivatives (HpD) for malignant tumors has been pioneered by Dougherty and his co-workers. This therapy is based on the activation of HpD by light. We have studied the effectiveness of PRT using laser equipment as a light source and intravenous HpD administration in the patients with esophageal cancer and gastric cancer.

We tried to apply this treatment for early gastric cancer and esophageal cancer cases in cases inoperable due to poor pulmonary and cardiovascular functions in order to obtaining complete case. On the other hand this method can be performed in order to improve the performance status in advanced cures.

MATERIAL AND METHODS

HpD, (Photofrin I and II) was obtained from Oncology Research and Development, (Cheektowaga N.Y.). In our studies, generally 2.5mg/kg of HpD was injected intravenously 72 hours prior to PRT.

The light source was an argon laser model 171-08, 15W 457.9-514.9nm (Spectra Physics Co, Mountain View, CA.) coupled to a dye laser (model 373-03) using Rhodamine B dye. The 514nm argon laser beam was converted to a 630nm beam by the dye laser. The quartz fiber (400 micron, Quartz Products Co. Plainfield, N.J.) was coupled to the laser using a fiber interface. The laser beam was transmitted via the quartz fiber inserted through the instrumentation channel of an esophagofiberscope or gastrofiberscope.

Irradiation time varied from 10-30 minutes with a power of 100 600mW at fiber tip. Photoradiation was performed 72 hours after intravenous administration of 2.5mg/kg of HpD. Photoradiation was performed at a distance of 1-3cm from the tumor. Light dosages were 27-360 J/cm². The procedure was performed in 10 esophageal patients (8 male, 2 female) and 24 gastric cancer patients (17 male, 7 female). In esophageal cancer cases, 5 cases were early cases and 5 cases were advanced cases (Im in 5, Iu in 2, Im-Ei in 2, Ce in 1). All were squamous cell carcinoma. Age distribution was 50-72 year old and the average was 62. Operation was performed in 5 cases after PRT and the others were inoperable because of their poor pulmonary function, or because they refused operation. Of the gastric cancer cases 13 cases were early stage cases and 11 cases were advanced stages cases (antrum in 8, corpus in 5, angle in 6, cardiac in 4, recurrence at the anastomotic site in a case of total gastrectomy in 1). Age distribution was 34-77 year old. Operation was performed in 19 cases after PRT and the others were inoperable due poor pulmonary function or refusal of surgery.

Results

In 5 early stage esophageal cancer cases complete remission was obtained in 3 and significant remission in 1. One case showed no remission. In this case the reason why no remission was obtained, was due to the wrong wavelength for HpD excitation as a result of instrumental difficulty. In 5 advanced stage cases, significant remission was obtained in 2 and partial remission in 3. In 14 early stage gastric cancer cases complete remission was obtained in 8, significant remission in 5 and partial remission in 1. In 11 advanced stage cases, significant remission was obtained in 2 and partial remission in 9.

Conclusions

- 1 PRT can be indicated in cases with early stage superficial G-I tumors.
- 2 PRT is not indicated to obtain complete remission in advanced cases.
- 3 PRT is effective to improve the performance status in advanced cases.
- 4 Technical problems concerning to radiation angle, side effects of HpD etc, still remained.