A FOLLOW-UP STUDY OF ND-YAG LASER TREATMENT OF EARLY GASTRIC CANCER WITH MUCOSAL INFILTRATION
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1. Introduction
We have been engaged since May, 1981 in Nd-YAG laser treatment of early gastric cancer lesions with the aim of radical cure. The purpose is to evaluate the efficacy of laser treatment in a follow-up study of laser-treated early gastric cancer.

2. Materials and methods

Materials. Twelve cases (18 lesions) of early gastric cancer lesions diagnosed endoscopically as being confined to the mucosal layer, not indicated for surgical operation because of severe physical complications or any other reasons. Major complications were malignant hyperthermia, liver cirrhosis, chronic renal failure, apoplexia, and Gravitz's tumor. The 12 cases comprised 8 of solitary cancer and 4 of multiple, classified in shape into 4 of Type I, 1 of Type IIa, 2 of Type IIc+IIb, and 6 (11 lesions) of Type IIc. The follow-up period since the initiation of laser treatment ranged 2 to 28 months. One patient died from hepatic coma associated with gastric bleeding and the other 11 were alive.

Methods.

(1) An Nd-YAG laser photocoagulator (Model 8000, Molectron Corp.) was used, and repeated photoradiations of a power output of 60 to 80 watts with a duration of 0.5 to 0.8 seconds were given to each lesion through the channel of a fibergastroscope.

(2) The Brilliant-Blue chromo-endoscopy was applied in each case for the endoscopic observation and determination of cancerous extension. The interval between two successive endoscopic observations was one or two weeks before the laser-induced ulcer had reached the S1 stage, and 3 months after the S1 stage, with appropriate applications of magnifying endoscopy and/or biopsy. The major purpose of applications of chromo-endoscopy or magnifying chromo-endoscopy was an earlier detection of the recurrence of cancer and a more accurate determination of the localization of recurrence, whether within or outside the territory of the previous laser treatment.

(3) When a laser treatment of multiple lesions located very near to each other produced a single ulcer, the laser-induced ulcer
was thereafter followed up as one single lesion.

(4) Instruments used were GIF-2T, GIF-P3, and GIF-HM.

3. Results

Out of the 14 follow-up lesions, 3 (21.4%) showed endoscopic appearances of suspected cancerous recurrence and 1 (7.1%) obtained a bioptic determination of cancerous recurrence with no endoscopic features of cancerous growth. Each diagnosis of the biopsy specimens from the 4 lesions was given as Group V, and the 3 taken from within the territory of the previous laser treatment had main histologic components of poorly-differentiated, well-differentiated, and well-differentiated adenocarcinoma, respectively, and the other taken from outside the range of the previous laser treatment had a histologic feature of signet ring cell carcinoma. The time interval between the laser treatment and the recurrence of cancer was approximately 6 months in 2 lesions and approximately 17 months in 2. Signet ring cell carcinoma confined to the mucosal layer in one lesion previously treated with laser was revealed by the autopic investigation of a patient having 2 lesions of Type IIc, who died from hepatic insufficiency associated with bleeding from gastric ulcer.

4. Conclusions

(1) Cancerous recurrence was noted in 4 lesions (one of Type I and 3 of Type IIc), in a follow-up study including biopsy of the laser-treated 14 lesions.

(2) The endoscopic finding of suspected cancerous recurrence were those of elevated appearance in the middle of the territory previously treated with laser. Those findings were recognized in 3 of the 4 lesions in which cancer recurred. The histologic diagnosis obtained through biopsy was poorly-differentiated adenocarcinoma in one and well-differentiated in the other 2.

(3) The histologic diagnosis of one lesion in which cancerous recurrence was determined by biopsy without endoscopic findings of recurrence was signet ring cell carcinoma.

(4) The location of cancerous detection after a laser treatment was within the laser-photocoagulated territory in 3 lesions, and outside the territory in one.

(5) An autopic examination revealed signet ring cell carcinoma confined to the mucosal layer at the location of the previous laser treatment, in one patient who died from hepatic insufficiency associated with bleeding from gastric ulcer.