Present Status and Observations made concerning our Nd-YAG Laser Endoscopy

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Since March 1980 we have actively practiced Nd-YAG laser endoscopy for hemostasis of massive upper GI hemorrhage, palliative treatment for GI strictures and radical therapy of early GI cancers. In this paper the present status of our laser endoscopy and certain observations made are reported.

Method: We use the so called Nd-YAG laser system, which is marketed under the brand name "mediLas" and made by MBB-AT, West Germany. In laser radiation, 70-80 watts of power and 0.5 second of exposure time were used for hemostasis and treatment of strictures, and for radical therapy of early cancers 40-60 watts and 1.0 second of exposure time were used. We made a thin forward-view endoscope with 2 channels by the help of Olympus to simplify the laser endoscopy. When lesions were located at the blind portion of the forward-view endoscope we used an oblique-view or side-view endoscope. The laser beam was transmitted endoscopically through a flexible quartz fiber with gas jet system. In cases of massive bleeding gastric lavage was actively performed before laser endoscopy. For patients' sedation 10mg of diazepam was injected intravenously in all cases and intratracheal anesthesia was never performed in any case.

Materials: Laser endoscopy was applied in 65 cases for hemostasis of bleeding, in 14 cases for palliative treatment of benign or malignant strictures and in 10 cases for radical therapy of early cancers.

Results: 1) Hemostatic effects of laser endoscopy were studied from the view point of bleeding lesion and the degree of bleeding. Bleeding from peptic ulcer, drug induced ulcer and M-W tears was perfectly controlled, but laser hemostasis was without success in 7 cases of stress ulcer, gastric cancer or esophageal varices. Bleeding of a mild or moderate grade were well controlled, but from 29 cases of serious bleeding the bleeding could not be stopped in 6 cases. As a result from the total of 65 cases, we obtained sufficient hemostasis in 89 percent at them.

2) In 2 cases of benign esophageal strictures and 5 cases of malignant ones, laser therapies were very effective; but for stenosis

due to progressive or recurrent gastric cancers it was effective only in 1/3 of the cases.

3) Nine cases of early gastric cancer and one case of early esophageal cancer were treated by laser endoscopy, since they were too poor for surgery or for which we decided against performing surgery. The follow-up results showed no malignancy on biopsy in all cases.

The following conclusions were obtained by this study.

- 1) The use of a thin laser endoscope (GIF-2T) and flexible laser guide fiber with gas jet system was significant to symplify laser endoscopy. Active gastric lavage was very effective for correct observation and laser radiation of bleeding focus.
- 2) The right selection of laser power and exposure time according to the characters of lesions was found to be necessary for the improvement of therapeutic effects.
- 3) For safe hemostasis in cases of arterial bleeding or big exposed bolld vessel, laser radiation must be performed around the vessel at first and then onto the vessel directly.
- 4) Palliative laser therapy was found to be very effective for benign or malignant stenosis of esophagus, but bougiering was of need for prophylaxis of re-stenosis.
- 5) When patients of early gastric cancer are too poor for surgery or refuse operation, we intend to treat cancer lesion by laser endoscopy.

Fig. 1 Laser endoscopy in bleeding cases

Bleeding lesion	No. of cases	Hemostasis obtained
		No. of cases (%)
Gastric ulcer	13	13 (100)
Duod. ulcer	2	2 (100)
Stomal ulcer	3	3 (100)
Drag ulcer	10	10 (100)
Stress ulcer	14	10 (71)
Gastric cancer	11	10 (91)
Esoph. varices	2	0 (0)
Others	10	10 (100)
Total	65	58 (89)

Fig. 2 Laser endoscopy for strictures

Stricture	No. of cases	Therapeutic effects
		No. of cases (%)
Esoph. st(malig.)	5	5 (100)
Esoph. st(benign)	2	2 (100)
Gastric st(malig.)	14	4 (29)
Total	21	11 (52)

Fig. 3 Laser endoscopy for early cancers

Case	Type of cancer	Therapies	Follow(months)	Last biopsy	Autopsy
65 f	Gastric llc	3	14	no malig.	nomalig.
71 m	Gastric lla+llc	5	10	no malig.	no malig.
71 m	Gastric lla	3	19	no malig.	
81 m	Gastric lla	3	8	no malig.	
79 m	Gastric llc	1	5	no malig.	
49 m	Gastric llc	2	4	no malig.	(-)
58 m	Gastric llc	2	3	no malig.	
59 m	Gastric llc	2	3	no malig.	
74 f	Gastric llc	1	3	no malig.	
82 m	Esoph. lla+llc	1	3	no malig.	(-)