



Endoscopic Laser Therapy in the Curative and Palliative Treatment of Upper Gastrointestinal Cancer

Hiroaki Suzuki, M.D., Otomi Miho, M.D., Yutaka Watanabe, M.D., Masayuki Kohyama, M.D., and Fusahiro Nagao, M.D.

Department of Surgery, Aoto Hospital; and Department of Endoscopy and Second Department of Surgery, Jikei University School of Medicine, Tokyo, Japan

Endoscopic laser treatment was initially applied for gastrointestinal bleeding, but has been actively extended, especially in Japan, to the curative treatment of early upper gastrointestinal cancers.

We have treated 10 cases of early gastric cancer and 1 case of early esophageal cancer by Nd-YAG laser radiation, and 2 cases of early gastric cancer by photochemical therapy (PCT) with argon laser + hematoporphyrin derivative. Also, 62 cases of advanced cancer were treated, 10 of the esophagus and 52 of the stomach, for bleeding (18 cases) or stenosis (34 cases). The cases were nonresectable or they were patients who refused surgery. Satisfactory results were obtained by treatment with YAG laser, but have not yet been obtained with PCT.

In order to find indications for the possible extension of endoscopic laser therapy to operable cases of early gastric cancer, we studied lymph node metastases in 200 cases of early gastric cancer surgically treated by us. It was found that early gastric cancers (both mucosal and submucosal) measuring less than 2 cm in diameter, of type I, IIa, and IIc (without ulcer scar), had no lymph node metastases and such cases can be treated by local therapy—such as endoscopic laser therapy.

In palliative endoscopic laser therapy for complications of advanced gastrointestinal cancers, there are no major problems with active performance. We obtained a high (90%) hemostatic rate in bleeding cases of upper gastrointestinal cancer and a satisfactory (65%) rate of dilating effect in cases of cancerous stenosis at the esophagus and cardia. A national survey in this field is also discussed in this report to show the present status of endoscopic laser therapy in the curative and palliative treatment of upper gastrointestinal cancer in Japan.

Nd-YAG laser was introduced in our department in 1980, soon after the senior author's (H.S.) return from Marburg, Federal Republic of Germany [1]. Laser endoscopy was initially applied for hemostasis of massive upper gastrointestinal bleeding and subsequently for curative or palliative treatment of early or advanced gastrointestinal cancer. In addition, since 1985, photochemical therapy (PCT) [or photoradiation therapy (PRT)] with argon laser + hematoporphyrin derivative (HPD) has been used for the curative treatment of early gastric cancer. In this article, the results of our endoscopic laser therapy for curative treatment of early gastrointestinal cancer and for palliative treatment of complications of advanced cancer are reported and

the present status of laser endoscopy in this field in Japan (a national survey of 66 institutions, including ours, was done by Takemoto [2] and by Oguro et al. [3] in November, 1985) is also presented. Furthermore, the possibility of extending the indicated range of curative treatment for early gastrointestinal cancer is discussed along with postsurgery follow-up results, the pathology of resected specimens in our department, and related literature.

Material and Methods

Table 1 summarizes the type of endoscopic laser therapy used for upper gastrointestinal cancer in our patients. Thirteen early cancers (esophagus, 1; stomach, 12) were treated with curative intent. Eleven of them were treated by Nd-YAG laser radiation (wavelength, 1,064 nm) and 2 others were treated by argon laser radiation (wavelength, 514.5 nm) + HPD.

Sixty-two advanced cancers (esophagus, 10; stomach, 52) were treated by laser: palliatively, for bleeding in 18 cases and stenosis in 34 cases. The Nd-YAG laser system used was Medilas of MBB (Munich, Federal Republic of Germany). The radiation power used was 80 watts, 0.5 second for hemostasis and 50–80 watts, and 0.5–1 second for treatment of cancerous stenosis. Argon laser + HPD therapy was performed with the assistance of Kato [4] (Laboratory of Electronic Technology; Tsukuba, Japan), who engineered a convenient argon laser system. HPD (2 mg/kg) was injected intravenously 2 days before argon laser radiation, and 300 nm of argon laser was endoscopically radiated for 20–40 minutes for therapy. For endoscopic laser therapy, we chiefly used GIF-2T, which was prepared by us with the help of Olympus for laser endoscopic use. Patients were sedated during the procedure by intravenous injection of 10 mg of diazepam and 40 mg of Buscopan.

In treatment of early cancer, follow-up examinations were performed with endoscopic biopsy. If biopsy was positive for malignancy, additional endoscopic laser therapy was actively performed until negative biopsy results were obtained.

Table 1. Endoscopic laser therapy in cases of esophageal and gastric cancer (Jikei University School of Medicine, Tokyo, Japan, 1986).

Purpose of therapy	Location of cancer, no. of cases	Type of laser therapy, no. of cases
Curative therapy for early cancer	Esophagus, 1; stomach, 12	Nd-YAG laser, 11; argon laser + HPD, 2
Palliative therapy for advanced cancer	Esophagus, 10; stomach, 52	Nd-YAG laser (hemostasis), 18; Nd-YAG laser, 33; argon laser + HPD (dilation of stenosis), 1

Results

Curative Treatment for Early Upper Gastrointestinal Cancer

For the treatment of early gastrointestinal cancer, surgery with lymphadenectomy is the treatment of choice, as the postoperative 5-year survival rate is over 90% in Japan. On the other hand, there is a considerable number of patients in whom surgery is contraindicated due to serious complications or advanced age, or for religious or social reasons. For curative treatment in such patients, we have actively applied endoscopic Nd-YAG laser therapy and argon laser + HPD therapy.

First, we experimentally radiated the early cancer with laser beams preoperatively and studied pathological changes in the radiated parts using resected specimens obtained at gastrectomy (Fig. 1). The results are as follows: (a) Mucosal cancers (both protruding type and depressed type) were completely eradicated by endoscopic laser therapy; (b) Submucosal cancer cells remained in the lower part of the submucosal layer even after laser radiation, when ulcer scars were present in the lesion; (c) Cancer cells still remained at the radiated part in 1 case treated with argon + HPD.

Clinically, endoscopic YAG laser therapy was employed in 11 inoperable cases of early gastrointestinal cancer and argon + HPD therapy was performed in 2 inoperable cases of early gastric cancer (Table 2). Informed consent was obtained from all patients.

Early esophageal cancer was curatively treated in 1 case, but this patient died due to postoperative recurrence of gastric cancer 6 months after laser therapy. Six patients with early gastric cancer died due to serious concurrent diseases or advanced cancer of other organs 2.5–14 months after laser therapy. In 3 of these 6 cases, autopsies revealed the disappearance of cancer cells in the stomach after laser therapy. The other 4 patients with early gastric cancer treated with YAG laser are still alive and final biopsy was negative for malignancy in every case. Two patients with early gastric cancer treated by argon + HPD therapy are alive after 6–10 months, but the final biopsy was positive for malignancy (incomplete treatment) in both cases.

Overall, we obtained relatively satisfactory results in patients treated by Nd-YAG laser, but we have not yet obtained sufficient data to recommend PCT for the curative treatment of early cancer.

The results of a national survey from 66 institutions concerning the curative endoscopic laser therapy of early upper gastro-

intestinal cancer are as follows (summarized in Tables 3 and 4). Twenty-two esophageal cancers were treated by laser endoscopy and followed up for more than 1 year. Follow-up endoscopic biopsy was negative for malignancy in 17 cases (77.3%). In addition, 459 early gastric cancers were treated by laser endoscopy and followed up for more than 1 year (Table 4). Follow-up biopsy was negative for malignancy in 364 cases (79.3%). These follow-up results are not satisfactory compared with the excellent postsurgery results that have been reported; however, it can now be said that about 75% of patients with inoperable early cancer can be curatively treated by endoscopic laser therapy, if they have no lymph node metastasis.

Palliative Treatment for Complications for Upper Gastrointestinal Cancer Hemostasis. Nd-YAG laser hemostasis was performed in 18 cases of massive bleeding from upper gastrointestinal cancer (Table 5). At emergency endoscopy, there were 4 cases of arterial bleeding, 10 cases of venous-capillary bleeding, and 4 cases of red clot. Among the 18 cases, hemostatic effect was obtained in 17 cases (94.5%): continuous in 14 (77.8%) and temporary in 3 (16.7%). One unsuccessful case of wide invasive cancer had arterial bleeding from multiple exposed vessels. Nd-YAG laser photocoagulation was found to be very effective for avoiding emergency surgery in operative cases or to control bleeding in inoperative cases.

Dilation of Stenosis. Cancerous stenosis was treated by endoscopic laser therapy in 9 patients with esophageal cancers, 11 cardiac cancers, and 14 antral cancers (Table 6). Laser treatment was found to be effective in 65% of cases of esophageal cancer and cardiac cancer, but only in 14% of cases of antral cancer. We obtained a dilating effect in 50% (14 excellent, 3 good) of patients with cancerous stenosis. In most of the unsuccessful cases, stenosis was longer than 5 cm. Initially, we treated long and pin-hole sized stenoses with a Savary-Gilliard dilator or an Eder-Peustow dilator, and then we performed Nd-YAG laser radiation. These dilators are also often used to prevent recurrence of stenoses.

In the national survey, 102 cases of bleeding from gastrointestinal cancer were treated by laser endoscopy, principally by Nd-YAG laser (Table 7). Hemostasis was obtained in 76 cases (74.5%). Table 8 shows the results of endoscopic laser therapy for upper gastrointestinal cancerous stenoses. Sixty-nine esophageal cancers, 74 cardiac cancers, and 71 antral cancers were treated by laser endoscopy. The rate of successful dilatation was as high as 74.3% for cardiac cancer, but as low as 49.3% for antral cancer. In cases of cancerous stenoses in the antrum, it was difficult to obtain satisfactory results even if a large sized lumen is produced by laser therapy. In such cases, poor gastric motility due to cancer invasion may have disturbed the passage of meals. On the other hand, in cases of cancerous stenoses in the esophagus or at the cardia, a large (>1.2 cm) lumen results in good passage. Complications in a total of 1,588 cases of gastrointestinal cancer treated by laser endoscopy curatively or palliatively consisted of bleeding in 1 case, perforation in 32 cases, and stricture in 2 cases (overall incidence of complications were 2.2%), but complications did not result in death in any patient.

If the depth of early cancer is correctly diagnosed before therapy, more complete treatment can be expected. Ida [5]

Case No.	Age	Sex	Type of early gastric cancer	Size of early gastric cancer (mm)	Figure of cancer and part of radiation (surface)	Pathology of gastrectomy specimen (cross section)	Type of laser
1	55	m	I mucosal	30 × 20			Nd-YAG
			IIa mucosal	20 × 20			Nd-YAG
2	67	m	IIc ^{ul(-)} mucosal	25 × 18			Nd-YAG
3	30	m	IIc ^{ul(-)} mucosal	65 × 60			Nd-YAG
4	40	m	IIc ^{ul(+)} mucosal	75 × 60			Nd-YAG
5	63	m	IIc ^{ul(+)} submucosal	35 × 25			Nd-YAG
6	56	m	IIc ^{ul(+)} submucosal	16 × 13			Nd-YAG
7	55	m	IIc ^{ul(+)} submucosal	35 × 25			Nd-YAG
8	56	f	IIc ^{ul(+)} submucosal	20 × 25			Argon + HpD

Fig. 1. Preoperative experimental laser radiation for early gastric cancer and its effect. Part of radiation; part of cancer disappeared; part of residual cancer. ul(-): ulcer scar negative in cancerous lesion, ul(+): ulcer scar positive in cancerous lesion.

Table 2. Curative endoscopic laser therapy for early esophageal and gastric cancer (Jikei University School of Medicine, Tokyo, Japan, 1986).

Case no.	Age (yr)	Sex	Early cancer		Reason for contraindication of surgery	Laser	No. of times laser therapy given	Irradiation (total joules)	Follow-up (mo)	Prognosis	Follow-up results for malignancy at biopsy
			Location	Type							
1	62	M	Esophagus	IIa + IIc	Apoplexy, gastric cancer (postsurgery)	Nd-YAG	1	776	6.0	Died	Negative
2	63	M	Gastric angle	IIc	Diabetes mellitus, apoplexy, myocardial infarction	Nd-YAG	3	13,477	14.0	Died	Negative
3	71	M	Gastric angle	IIa + IIc	Diabetes mellitus, heart failure, renal failure	Nd-YAG	5	14,274	9.5	Died	Negative
4	81	M	Gastric angle	IIa	Diabetes mellitus, surgery refused	Nd-YAG	3	7,208	8.0	Alive	Negative
5	71	M	Gastric angle	IIa	Heart failure, surgery refused	Nd-YAG	3	6,478	65.0	Alive	Negative
6	79	M	Gastric antrum	IIc	Colon cancer (postsurgery)	Nd-YAG	1	1,155	5.0	Died	Negative
7	49	M	Gastric angle	IIc	Esophageal cancer (postsurgery), liver metastasis	Nd-YAG	2	5,075	4.0	Died	Negative
8	53	M	Gastric angle	IIc	Brain cancer (postsurgery), lung metastasis	Nd-YAG	2	3,244	2.5	Died	Negative
9	57	M	Gastric corpus	IIc	Diabetes mellitus, liver cirrhosis	Nd-YAG	1	3,500	13.0	Died	Negative
10	74	M	Gastric angle	IIc	Diabetes mellitus, liver cirrhosis	Nd-YAG	2	8,722	36.0	Alive	Negative
11	82	M	Gastric angle	IIa	Respiratory disturbance (postsurgery)	Nd-YAG	2	39,688	9.0	Alive	Negative
12	73	F	Gastric antrum	IIc	Aplastic anemia	Argon + HPD	2	300 nm × 80 min.	10.0	Alive	Positive
13	65	F	Gastric antrum	IIc	Myocardial infarction	Argon + HPD	1	300 nm × 40 min.	6.0	Alive	Positive

Table 3. Curative treatment for early esophageal cancer.^a

Type of laser	No. of cases	Negative for malignancy at biopsy
Nd-YAG ^b	9	7
Argon	1	0
Ar-dye + HPD ^c	11	9
N ₂ -dye + HPD ^d	1	1
Total	22	17 (77.3%)

Results from 66 institutions, reported by Oguro et al. [3]. Reprinted with permission of publisher.

^aFollowed up for more than 1 year.

^bNeodimium-YAG laser.

^cArgon-dye laser with hematoporphilin derivative.

^dN₂-dye laser with hematoporphilin derivative.

Table 4. Curative treatment for early gastric cancer.^a

Type of laser	No. of cases	Negative for malignancy at biopsy
Nd-YAG	413	325
Argon	11	9
Argon + HPD	1	1
Ar-dye + HPD	30	28
Other	4	1
Total	459	364 (79.3%)

Results from 66 institutions, reported by Oguro et al. [3]. Reprinted with permission of publisher.

^aFollowed up for more than 1 year.

Table 5. Endoscopic laser therapy for hemostasis of bleeding from esophageal and gastric cancer.

Type of bleeding (emergency endoscopy)	No. of cases	Hemostatic effect		
		Continuous	Temporary	Failure
Arterial bleeding	4 (1) ^a	3 (1) ^a	0	1
Venous-capillary bleeding	10	7	3	0
Red clot on exposed vessel	4	4	0	0
Total	18 (1) ^a	14 (1) ^a	3	1

^aNumbers in parentheses indicate esophageal cancer.

Table 6. Endoscopic laser therapy for stenosis.

Location of stenosis	No. of cases	Dilating effect		
		Excellent	Good	Failure
Esophagus	9	6	0	3
Esophagocardiac junction	11	6	1	4
Gastric antrum	14	2	2	10
Total	34	14	3	17

(Asahi University) studied the merit of dye endoscopy in the diagnosis of the depth of early gastric cancer and reported that 85% of mucosal cancers, 52% of submucosal cancers, and 81% of advanced cancers (deeper than muscularis propria) can be accurately detected by endoscopy. Takemoto [2] reported that before endoscopic laser therapy, 14 early cancers were well classified into 4 mucosal cancers and 10 submucosal cancers by means of ultrasonic endoscopy and that the depth of laser radiation was correctly observed by it.

Concerning palliative treatment for complications of gastrointestinal neoplasms, Fleischer [6] reported the results of palliative laser treatment in 1,098 cases from 26 hospitals in the

Table 7. Hemostasis by laser endoscopy for bleeding from gastrointestinal cancer.

No. of bleeding cases	Hemostatic effect obtained
	No. of cases (%)
102	76 (74.5)

Results from 66 institutions, reported by Oguro et al. [3]. Reprinted with permission of publisher.

Table 8. Dilation by laser endoscopy for stenosis.

Location of stenosis	No. of cases	Dilating effect obtained
		No. of cases (%)
Esophagus	69	41 (59.4)
Cardia	74	55 (74.3)
Antrum	71	35 (49.3)
Postoperative stricture	52	44
Other	70	42
Total	336	217 (64.6)

Results from 66 institutions, reported by Oguro et al. [3]. Reprinted with permission of publisher.

Bleeding Lesion	Grade of Bleeding		
	Mild 10cases	Moderate 36cases	Serious 34cases
Gastric Ulcer	○	○○○○○ ○○●	○○○○
Duodenal Ulcer		○○●	○○●
Stomal Ulcer		○	○○
Drug-induced Ulcer	○○	○○○○○	○○○○○×
Stress Ulcer		○○●●● ×	○○○○○ ○○●×××
Gastric Cancer	○○○○○	○○○○●	○○×
Mallory-Weiss Syndrome		○○○	
Esophageal Varices			××
Others	○○	○○○● ○	●

Fig. 2. Effect of laser photocoagulation. ○, Continuous hemostasis; ●, temporary hemostasis, but rebleeding; ×, unsuccessful.

United States of America. He reported that endoscopic laser therapy decreased morbidity by decreasing dysphagia, reducing the chance of aspiration, improving performance status. There were some data showing that it improved survival.

We performed laser endoscopy for hemostasis of upper gastrointestinal bleeding in 80 cases and obtained a high (90%) hemostatic rate (Fig. 2). Bleeding from unresectable or recurrent cancer is often uncontrollable. We consider that endoscopic laser treatment is indicated for such bleeding and we have obtained a satisfactory hemostatic rate of 94.4%.

We classify the degree of upper gastrointestinal bleeding into 3 grades: mild, moderate, and serious, depending on the patient's distress and the response to rapid blood transfusion of up to 1,000 ml. Serious bleeding is an indication for emergency surgical intervention and as well as for endoscopic surgery, namely, laser treatment (Fig. 3). Mild or moderate bleeding is easy to control and more economical techniques such as

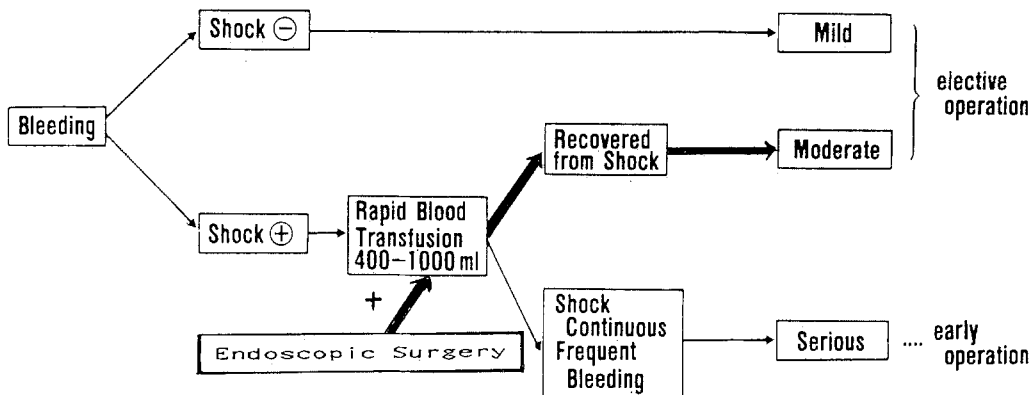


Fig. 3. Grade of bleeding (Nagao's classification).

Table 9. Emergency endoscopy and endoscopic hemostasis (1980-1985).

Bleeding focus	Emergency endoscopy	Endoscopic hemostasis (total)	Laser (YAG)	Electrocoagulation	Heat probe	Microwave	Ethanol injection	Sclerotherapy	Spray of clotting factors
Gastric ulcer	66	28	13	4	1	1	4	2	3
Duodenal ulcer	31	11	6	2	-	1	2	-	-
Stomal ulcer	17	11	3	1	-	2	4	1	-
Drug ulcer	26	20	13	2	1	1	-	3	-
Stress ulcer	50	39	18	7	1	3	6	2	2
Mallory-Weiss tear	19	7	3	-	-	1	-	2	1
Gastritis	23	3	-	-	2	-	-	-	1
Gastric cancer	41	25	13	4	5	1	2	-	-
Esophageal varices	88	82	2	-	3	-	-	77	-
Other	45	30	8	9	6	2	3	2	-
Total	406	256	79	29	19	12	21	89	7

electrocoagulation, heat probe, microwave, pure ethanol injection, and spraying of clotting factors are useful in its control. Table 9 shows our emergency endoscopy in 406 cases and emergency endoscopic hemostasis in 256 cases from the viewpoint of bleeding lesions and endoscopic methods for hemostasis.

Discussion

Since clinical application of laser endoscopy, a decade has passed [7]. In 1980, there were only a few hospitals employing laser systems in Japan. As of November of 1985, there were 66 institutions. Endoscopic laser treatment has been initially employed for gastrointestinal bleeding [8], but has been extended to the treatment of gastrointestinal cancer [9, 10]. Particularly, curative treatment of early upper gastrointestinal cancer has been enthusiastically performed in Japan because many esophageal or gastric cancers are detected at an early stage. Controversy still exists regarding the technique and indication of curative endoscopic laser therapy for early gastrointestinal cancer.

We would like to discuss the problems in technique and indication of curative endoscopic laser treatment for early gastrointestinal cancer. The national survey showed an unsatisfactory (less than 80%) rate of negative results for malignancy at follow-up biopsy; however, one advantage of endoscopic laser therapy is that treatment can be repeated until obtaining negative biopsy results. In the future, improved curative treatment can be expected by improvement of the radiation method or more careful selection of indicative cases. Some investiga-

tors are using a contact or injection probe to enhance effectiveness. Concerning the selection of indicative cases, Takemoto [2] reported that endoscopic laser therapy was curative by follow-up biopsy in patients with early cancer: measuring less than 2 cm in diameter, of the elevated type, of well-differentiated histology, and with cancer invasion limited to the mucosa.

Before considering the indication of endoscopic laser therapy for early gastric cancer, we will discuss the postsurgery results in Japan. Since 1973, we have treated 118 cases of early gastric cancer by surgery at Aoto Hospital. Two (1.7%) of these patients died due to postoperative complications and 2 (1.7%) died due to early recurrence of cancer. Kaibara et al. [11] (Tottori University) reported that 452 cases of early cancer (1948-1981) were treated by surgery and that 6 (1.3%) died due to postoperative complication and 20 (4.4%) died due to residual or recurrent cancer. Takagi et al. [12] (Cancer Research Hospital) reported the follow-up results in 1,000 cases of early cancer treated by surgery + systemic lymphadenectomy. There were 4 cases of operative deaths, and 35 cases (3.5%) due to recurrent cancer resulting in death. Nishi et al. [13] (Kagoshima University) reported on the survival rate of early gastric cancer in Japan. Based on the survey of prognosis in early gastric cancer, the 5-year survival rate was 94-100% of cases of mucosal cancer and 88-96% in cases of submucosal cancers. Ideally, endoscopic laser therapy for early gastric cancer should ultimately produce a comparable cure rate in follow-up studies after treatment.

When we consider the indication of laser therapy for early

Size Type	~1.0	1.1~2.0	2.1~3.0	3.1~5.0	5.0~
I			○ △	○ △	△△
IIa	△	○○ △	○○○ △	○○○ △	○○
IIc(Ul.-)	○○○	○○○○○ △△	○ △△△	△△△	
IIc(Ul.+)	○○	○○○○○○○ ○○○○○○○ ○○○ △△△△	○○○○○○○ ○ △△△△△ △	○○○○○○○○○ ○○○○○○○○○ ○ △△△△△△△△ △△ △△△△△	○○○○○○○○○ ○○○○○○○○○ ●● △△△△△△△△ △△△△△
IIc+III	○ △△	○ ● △ △	○○ △	○○ △△ △△	○ △
IIa+IIc	△	○ △ △	△△	● △△ △	△△
IIc+IIa		○○		○○ △△	△
IIc+IIb IIb+IIc			○ △	○	○○○○○○

- m
- m metastasis (+)
- △ sm
- ▲ sm metastasis (+)

Fig. 4. Early gastric cancer: Type, size, depth, and lymph node metastasis. m: cancer in mucosal layer, sm: cancer invasive to sub-mucosal layer.

gastric cancer versus surgery, the incidence of lymph node metastasis is one of the most important factors because laser therapy is limited to local treatment. Figure 4 shows the type, size, depth, and lymph node metastasis of 200 early gastric cancers in our group, investigated by Watanabe et al. [14].

Overall, lymph node metastasis was not found in 96.5% of mucosal cancers. The results showed that there is no possibility of lymph node metastasis in early cancer measuring less than 2 cm in diameter—type I, IIa, and IIc (without ulcer)—in both mucosal cancer and submucosal cancer [9].

Kitaoka and Yoshikawa [15] (National Cancer Center) studied pathology in 1,000 surgical cases of early gastric cancer and showed that all mucosal cancers without an ulcer scar in the lesion and submucosal cancer with minimal cancer invasion in the submucosal layer of type I, IIa, IIc can be treated by local therapy, as early cancers of such types had no lymph node metastasis.

Bleeding from esophageal varices is not indicated for laser therapy and we treat it mainly by means of sclerotherapy [16]. By this method, we have obtained a high (>90%) hemostatic rate in patients with acute bleeding and a satisfactory (>90%) eradicating effect of varices.

Concerning palliative treatment of malignant stenosis in the upper gastrointestinal tract, Ell et al. [17] reported 4 types of techniques of endoscopic laser therapy. These techniques are: (a) laser therapy beginning at the proximal margin and working toward the distal margin; (b) laser therapy in endoscopically-passable stenoses, working from the distal margin in the proximal direction; (c) combined laser therapy and bougienage in endoscopically-impassable stenoses; and (d) laser therapy carried out along the laser-resistant guide probe from the proximal margin toward the distal margin in endoscopically-impassable stenoses. We mainly use the first technique in patients with endoscopically-passable stenoses and the third technique for endoscopically-impassable stenoses.

Conclusion

Endoscopic laser therapy to cure early gastrointestinal cancer is practiced only in Japan and the results obtained thus far are not yet satisfactory. When the type, size, and depth of cancer invasion can be diagnosed more correctly by ultrasonic endoscopy, dye-endoscopy, or other means, we believe that some early gastrointestinal cancers can be curatively treated by endoscopic laser therapy and this will result in broadening its

current indication range. Concerning palliative laser therapy, there are minimal problems in its performance in cases with bleeding or stenosis. Other endoscopic therapeutic techniques, for instance, electrocoagulation, heat probe, microwave, pure ethanol injection, and sclerotherapy [16] for hemostasis and bougienage with dilators for the treatment of stenosis are very helpful to support or enhance the effects obtained by endoscopic laser therapy.

Résumé

Le laser par voie endoscopique a été utilisé d'abord pour obtenir l'hémostase des hémorragies digestives mais on a récemment étendu ses indications au traitement des cancers gastrointestinaux et, au Japon, aux cancers du tube digestif supérieur à leur début.

Nous avons traité 10 cas de cancer gastrique au début (early gastric cancer) et un cas de cancer de l'oesophage précoce par le laser Nd-YAG, et 2 cas de cancer gastrique précoce par le laser Argon et photochimique (PC). C'étaient des patients inopérables ou refusant toute chirurgie. Des résultats satisfaisants ont été obtenus avec le laser YAG mais non avec le traitement PC.

Pour essayer de définir l'indication du traitement par laser endoscopique, nous avons étudié les ganglions lymphatiques provenant de 200 cas de cancer gastrique précoce traité chirurgicalement dans notre unité. Nous avons trouvé que dans les cancers précoces (muqueux ou sous-muqueux) mesurant 2 cm ou moins, des types I, IIa, IIc, il n'y avait pas de métastases lymphatiques: ces cas pouvaient parfaitement être traités par laser par voie endoscopique.

Dans le traitement palliatif des complications des cancers intestinaux avancés, le laser joue un rôle évident. Dans les cancers du tube digestif supérieur, les taux d'hémostase des hémorragies et de reperméabilisation (forage) des sténoses oesophagiennes et cardiales atteignent respectivement 90% et 65%. Les résultats d'une enquête nationale au Japon montrent la place qu'occupe actuellement le traitement par laser des cancers du tube digestif supérieur.

Resumen

El uso del láser por vía endoscópica fue inicialmente aplicado para lograr hemostasia en casos de sangrado gastrointestinal, pero ha sido activamente extendido, especialmente en el Japón, al tratamiento curativo de cánceres gastrointestinales tempranos.

Hemos tratado 10 casos de cáncer gástrico temprano y un caso de cáncer esofágico mediante radiación con láser Nd-YAG, y 2 casos de cáncer gástrico temprano con terapia fotoquímica con el láser de argón + derivado hematoporfirínico. Además, 62 casos con cáncer avanzado, 10 del esófago y 52 del estómago, fueron tratados por hemorragia (18 casos) o estenosis (34 casos). Fueron pacientes inoperables o que habían rehusado cirugía. Se obtuvieron resultados satisfactorios en el tratamiento con el láser YAG, pero no con la terapia fotoquímica.

Con el objeto de encontrar una posible extensión de la terapia endoscópica con láser a pacientes con cáncer gástrico temprano, estudiamos las metástasis ganglionares en 200 casos de cáncer gástrico temprano tratados quirúrgicamente por nuestro

grupo. Se encontró que los cánceres gástricos tempranos, tanto los mucosos como los submucosos, de menos de 2 cm de diámetro o los de tipo I, IIa, y IIc, no tienen posibilidad de hacer metástasis a los ganglios linfáticos, y estos casos pueden ser tratados mediante terapia local tal como la terapia endoscópica con láser.

En cuanto a la terapia endoscópica con láser de tipo paliativo para las complicaciones de los cánceres avanzados, no existe mayor problema para emprenderla en forma activa. Logramos una alta (90%) tasa de hemostasia en casos de sangrado en pacientes con cáncer de la vía digestiva alta y una tasa satisfactoria (65%) de dilatación adecuada en pacientes con estenosis del esófago o del cardias. También se discute una revisión nacional realizada para demostrar el estado actual de la terapia curativa con láser endoscópico en el manejo curativo y paliativo del cáncer de la vía gastrointestinal alta en el Japón.

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