



2nd INTERNATIONAL SYMPOSIUM ON LASER SURGERY

Laser Phototherapy in Man Using Argon and  
Neodymium:YAG Lasers

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Argon-ion and Neodymium:YAG laser phototherapy have been previously reported to be useful in the therapy for upper gastrointestinal hemorrhage in man. The purpose of this report is to describe the use of both of these modalities in the treatment of patients with acute upper gastrointestinal bleeding. All patients admitted to the hospital with acute upper gastrointestinal hemorrhage had an Ewald tube passed to clear the stomach of blood and debris. Ice saline lavage was employed for thirty minutes in an attempt to control the hemorrhage. Often times the cooling of the stomach and removal of blood clots alone will slow or stop the hemorrhage. After thirty minutes of lavage, if bright red material was still returned from the Ewald tube, the patient was consented for therapeutic laser endoscopy. An initial diagnostic endoscopy was done to identify the source of bleeding and then the laser scope as passed in an effort to treat the bleeding site.

An Argon-ion laser coupled with a corning fiber was used and had an output of 1.5 Watts. The exposure time for each patient ranged from thirty seconds to several minutes. This system was incorporated inside a standard fiberoptic endoscope. Using the Argon-ion laser, 12 selected patients were treated 19 times. The types of lesions treated included gastritis, gastric ulcer, Mallory-Weiss tear, gastric varix and gastric telangectasia.

Of the Argon patients, one patient had Osler-Weber-Rendu disease. He had rebled once within eight hours of therapy from the exact same site that was treated. This was again treated and the hemorrhage stopped. Several weeks later he was admitted again to the hospital

for a gastric hemorrhage from a different lesion, that site was treated successfully. One patient had a Mallory-Weiss lesion which rebled after laser treatment from the same site within eight hours subsequent to a severe episode of vomiting. He was retreated and again hemostasis was accomplished. Two gastric ulcer patients were unable to be stopped at all with the Argon laser and were sent to surgery. Another patient with a gastric ulcer was treated two times on two admissions, both times the rebleeding was within eight hours from the same lesion but stopping each time with treatment. There was no further evidence of rebleeding in these patients prior to discharge. Another patient with a gastric ulcer was treated twice for bleeding during one admission, but the lesions were at different locations. Three patients with gastritis were treated successfully, three times, one time each. One patient with a bleeding gastric varix was treated only once and successfully (Table I). In summary, 12 patients were treated 19 times, five of these treatments were unsuccessful. Two bleeding lesions were unable to be stopped immediately and three patients rebled within eight hours. The other patients within the study that were treated more than once had separate lesions or bled from the same lesion after more than eight hours.

A Neodymium:YAG laser coupled to a Nath fiber was used in the next group of patients and had an output of 60 Watts. Exposures of 0.5 seconds were used and the exposure per patient ranged from 1.5 seconds to 5 seconds. This system was incorporated inside a specially modified upper endoscopy. These were unselected patients that continued to rebleed after vigorous ice saline lavage. Eight patients

were treated 11 times. Two patients developed a different new bleeding lesion during hospitalization both successfully coagulated. One patient with a gastric ulcer rebled after being stopped for 24 hours. He was treated and the bleeding was unable to be controlled and he went to surgery.

There were seven patients with gastric ulcers treated eight times and three patients with Mallory-Weiss tears treated three times. One out of eight patients were unable to be stopped giving a success rate of 88% using the Neodymium:YAG laser (Table II).

In these two series, twenty patients were treated a total of thirty times. Twelve patients were treated with the Argon-ion laser and eight patients were treated with the Neodymium:YAG laser. This initial experience in laser phototherapy of gastrointestinal bleeding was performed with the low-power Argon-ion laser and the high power Neodymium:YAG laser. We found that the Neodymium:YAG laser is able to coagulate more vigorously bleeding lesions much more quickly than the Argon-ion laser. Also there was a greater frequency of rebleeding after Argon-ion laser phototherapy of gastrointestinal hemorrhage than with the Neodymium:YAG laser phototherapy. It was my impression that the Argon-ion laser vaporized more tissue leaving deeper lesions than the Neodymium:YAG in these twenty patients. Healing time in the patients who had follow-up endoscopy was equal for bleeding lesions in either group.

Thus, Argon-ion and Neodymium:YAG laser phototherapy for upper gastrointestinal hemorrhage is effective. It is this form of

endoscopic therapy that has the capability of converting emergency surgery for acute upper gastrointestinal hemorrhage into an elective procedure, if necessary at all. It offers an alternative mode of therapy for lesions, and patients not readily amenable for surgery. It appears the Neodymium:YAG is superior to the Argon-ion laser in its ability to effect hemostasis for acute upper gastrointestinal lesions hemorrhage in man.

TABLE I

Human Argon Laser Phototherapy

<u>Lesions</u>	<u>Patients</u>	<u>Treatment</u>	<u>Results</u>
Mallory-Weiss	3	4	74% successful
Gastric ulcers	4	8	2 unsuccessful
Gastritis	3	3	3 rebled in 8 hrs.
Oslar-Weber-Rendu	1	1	
Gastric varix	1	1	
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	12	19	

TABLE II

Nd:YAG Phototherapy in Gastrointestinal Hemorrhage

<u>Lesions</u>	<u>Patients</u>	<u>Treatment</u>
Gastric Ulcer	7	8
Mallory-Weiss	3	3

Results 8% successful

88%