Nd-YAG laser therapy for gynecological disease.

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Nd-YAG laser has been used in many field of medicine because of the higher power density and the more penetrative ability among those various beams. After basic experiment, we have developed the micro-manipulator attached to a colposcope to apply a conservative therapy for cervical disease by using Nd-YAG laser coagulator, Molelectron Model 8000. Basic experiment: The laser beam was shot on the squamous epithelium, S-C junction, columnar epithelium and muscle of the extirpated uterine cervix in a manner of various power, 2 seconds duration and 3mm spot size. Clinical methods and materials: One hundred and nine patients; 61 with portio erosion, 46 with dysplasia (mild 7, moderate 18, and severe 21) and 2 with carcinoma in situ were placed into the therapy and those entire transformation zone were vaporized by the laser (30w, 3mm spot size, continuous wave) to the depth of 5mm. The treatment was easily performed at the outpatient clinic without anesthesia. Following therapy, patients have been followed being examined by colposcope and cytology. Results: 1) The vaporized depth correlated well depending on various power. The vaporized area was formed into a U shaped and carbonized layer varied from 0.02-0.09mm, necrotic layer varied from 0.23-0.45mm. 2) Micromanipulator-The micromanipulator being attached to a colposcope was newly designed 2 silica lens and can focus the laser beam from 1.5 to 3.0mm diameter on a focus of a colposcope. The laser spot can be easily moved by using a coaxial X-Y mechanism. A linear ratio was observed between indicated power and output power. 3) A typical case of healing process is shown the following. Just after the treatment the vaporized crater is covered with the thin carbonized layer and absence of bleeding. At 1st week after treatment, the crater is covered with the necrotic layer and there occurs moderate watery discharge with foul smell. Then almost all necrotic layer has disappeared by 2 weeks. Delayed bleeding occurs at that time and vaginal discharge becomes dark bloody or bloody in small amount. After this a granulation appears on a vaporized layer and the surface is covered by squamous epithelium until 5 or 6 weeks under the condition of a visible S-C junction. Fifty-five patients out of 61 portio erosion were completely healed at the initial treatment, showing 90.2% of cure rate. The mean healing period by colposcopic evaluation was 5.7 weeks and no symptomatic discharge was reported during the

the follow-up of 4 to 24 months duration. All of 46 dysplasia were healed colposcopically by the initial treatment and the mean healing period was 5.3 weeks. However, 1 patient out of 18 moderate dysplasia showed the residual lesion. Then the over all cure rate of dysplasia following the initial treatment is calculated to be 97.8% during the follow-up period of 2 to 23 months. 2 cases with carcinoma in situ were both healed by the initial treatment. The mean healing period was 6.0 weeks and there appears no evidence of recurrence for 15 to 23 months. All of the 109 patients noted pain and/or heat sensation during treatment, but all patients tolerated the procedure well. However 3 patients complained of fairly strong pain even after treatment and required some pain drugs. 4 patients had ricocheting beam to the vaginal wall by accident. Bleeding on treatment was well controlled by the laser at reduced power which is an advantage of YAG laser coagulation. Delayed bleeding following 2 to 3 weeks of the therapy occurred in 23 patients. They were satisfactorily controlled by YAG laser coagulation. The silver nitrate alone stopped the bleeding of 8 patients. 7 patients with dysplasia and 4 patients with portio erosion developed cervical stenosis, although they can be followed by endocervical cytology. No infection or scar formation was observed in this series. Nd-YAG laser is certainly an effective and promising clinical tool in the treatment of the uterine cervical disease.