Background and Aims

Low level laser therapy (LLLT) is currently achieved using mainly the semiconductor, Nd:YAG, and HeNe lasers. Since 1986, we have been treating peripheral facial palsy patients with LLLT, irradiating points approximately corresponding to the area over the stellate ganglion and foramen stylomastoideum. The power incident at the tissue which appeared to have significant therapeutic effects, putatively acting through the nervous system, was 300 mW for both the semiconductor laser or Nd:YAG laser. This paper reports the treatment of facial palsy patients with LLLT using the Nd:YAG laser with a contact tip. The clinical procedure and modalities are presented.

Subjects and Methods

The subjects were thirty patients who suffered from peripheral facial palsy (Bell's palsy, Ramsay Hunt syndrome), comprising 16 males and 14 females. The laser apparatus used was the Nd:YAG Contact Laser CL-50 made by S.L.T. Japan, delivering 1,064 nm in continuous mode. The incident output power was 300 mW (power density 9.55 W/cm²). The laser handpiece, equipped with a laser tip of 2 mm in diameter, was positioned on the skin over the approximate area of the stellate ganglion and the foramen stylomastoideum on the disturbed side (Fig.1), and each target was irradiated for 10-15 min (energy density, 5,700 – 8,550 J/cm²). The treatment regimen called for 1-2 sessions/week. The clinical procedure was to press down on the sternocleidomastoid muscle on the disturbed side with a finger and then position the laser handpiece on the skin over the sternoclavicular joint so that the skin was depressed by about 1 cm.

Fourteen patients were treated in the LLLT group and sixteen patients formed the LLLT combined with pharmacotherapy group. Vitamin B complex, Steroids and ATP agents were administered appropriately. Estimations were conducted by checking Yanagihara’s facial palsy recovery score (Fig.2) and from the subjective comments of the patients themselves.

Case Report

A 48-years-old man suffered from facial palsy with onset 1 week previous to presenting. The treatment was conducted in the above manner and all symptoms were completely cured 4 weeks after the initial treatment (Fig.3).

Results

A complete cure was achieved in 11 cases (36.7%), 16
cases were partially cured (53.3%) and in 3 cases results were poor and/or failures (10.0%), the overall efficacy rate was 90.0% (Fig.4). Efficacy in the LLLT group combined with pharmacotherapy was much higher (100%) than in the LLLT alone group (78.6%) (Fig.5). When the effectiveness was compared with the difference of the degree of palsy at the initial treatment, the incomplete palsy group showed much higher efficacy (95.6%) than the complete palsy group (71.4%). Most of the completely cured and partially cured cases healed within few months after the initial treatment. However, the symptoms of 3 patients whose results were poor or a failure revealed no remarkable change even when irradiation was given more than 20 times.

**Conclusions**

Conventional stellate ganglion blocking is difficult to perform, and failure is frequently seen. Complications such as regional anesthesia intoxication and cardiopulmonary arrest are occasionally observed. On the other hand, LLLT is easier to perform, is pain-free and has the additional benefit of being non-invasive. The results of treating 30 facial palsy patients with LLLT have revealed the usefulness of this modality at the wavelength and parameters used in the present report. In addition, when laser therapy was conducted as soon
as possible after onset of the symptoms, clinical efficacy was high. However when the condition had been allowed to progress for a long time after the symptoms first occurred, LLLT was not so effective.

In conclusion, the therapeutic results in a series of thirty peripheral facial palsy patients treated with contact Nd:YAG LLLT suggested the usefulness of this approach, and it is a recommendable modality as a non-invasive treatment strategy for patients who suffer from facial palsy.

![Fig.4 The results of facial palsy recovery.](image)

Comparison of results between laser treatment and combination of pharmacotherapy

<table>
<thead>
<tr>
<th></th>
<th>Completely cured</th>
<th>Partially cured</th>
<th>Failures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laser</td>
<td>0</td>
<td>11 cases (78.6%)</td>
<td>3 cases (21.4%)</td>
</tr>
<tr>
<td>Laser + Pharmacotherapy</td>
<td>11 cases (68.8%)</td>
<td>5 cases (31.2%)</td>
<td>0</td>
</tr>
</tbody>
</table>

![Fig.5 Comparison of results between laser treatment on its own and in combination with pharmacotherapy.](image)

![Fig.6 Correlation of the degree of recovery from facial palsy to the degree of palsy seen at the first visit.](image)

![Fig.7 The relationship between the symptomatic onset of facial palsy and the results seen at the time of recovery.](image)