Experience and 3-Year Results of Diode Laser Cycloablation in Adult Glaucoma

Ansari G, Gruener AM, Page CLJ, Griffiths MFP
Department of Ophthalmology, Frimley Park Hospital NHS Foundation Trust, Surrey, UK

Introduction and Purpose

Refractory glaucoma is a challenging condition to treat, and cyclodestructive procedures are generally reserved for the treatment of end-stage glaucoma. Ciliary body ablation has evolved from cyclodiathermy and cyclocryotherapy to transscleral 810 nm semiconductor diode laser. The uveal melanin selectively absorbs the 810 nm wavelength offering deeper ciliary body coagulation and a lower incidence of complications. There is a lack of consensus on the optimal laser parameters and treatment patterns.

We undertook this retrospective study to evaluate the long-term efficacy of transscleral diode laser cycloablation with a repeatable standard protocol in various types of refractory primary and secondary glaucoma in adults.

Methods

Retrospective study of 70 eyes of 62 patients, observed for up to 36 months after cycloablation. The treatment pattern involved 25 burns in two rows, sparing the 3, 9 and 11-1 o’clock positions. All patients were treated with the OcuLight SLx 810nm diode laser photococagulator and the Iridex G-Probe.

The standardised settings were as follows:
- light iris - 1500 mW for 3500 ms
- dark iris - 1250 mW for 4000 ms

Results & Conclusion

Mean intraocular pressure (IOP) pre-operatively on IOP-lowering medication was 32.7 mmHg (median 30.0 mmHg). Mean IOP at 3 months post-operatively was 19.1 mmHg (median 15.0 mmHg) and at 12 months 18.3 mmHg (median 15.5 mmHg). At 2-year follow-up we measured a mean IOP of 15.6 mmHg (median 15.0 mmHg). By final review, mean IOP had dropped to 14.9 mmHg (median 14.0 mmHg), which was a 45.6% reduction from baseline levels. 34.3% of eyes required multiple treatment sessions (range 2-4).

Our results were comparable with those of other centres:

<table>
<thead>
<tr>
<th>Eyes</th>
<th>Current (Frimley)</th>
<th>Vernon² (Nottingham, UK)</th>
<th>Gaasterland² (USA)</th>
<th>Diamond⁴ (Bristol/Norfolk, UK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline IOP (mmHg)</td>
<td>32.7</td>
<td>27</td>
<td>36.4 ± 12.4</td>
<td>40.7 ± 13.7</td>
</tr>
<tr>
<td>Final IOP (mmHg)</td>
<td>18.3 ± 4.0</td>
<td>14.9 ± 2.7</td>
<td>15.6 ± 6.3 (38 – 84 months, mean 65.7)</td>
<td>20.3 ± 8.7 (22 months median)</td>
</tr>
<tr>
<td>Hypotony</td>
<td>7.1%</td>
<td>3.7%</td>
<td>17.7 ± 10.9 (17 months mean)</td>
<td></td>
</tr>
<tr>
<td>Laser Technique</td>
<td>(as discussed above)</td>
<td>14 burns 270 degrees</td>
<td>17-19 burns 270 degrees (avoided temporal 90 deg)</td>
<td></td>
</tr>
</tbody>
</table>

Any patient previously on oral acetazolamide was able to stop it post-operatively. However, 60 out of 70 eyes (85.7%) required further treatment with topical anti-glaucoma medication. Hypotony (IOP < 5 mmHg) was observed in five eyes (7.1%), none of which had any specific symptoms or associated drop in vision. Phthisis was seen in one, previously painful blind eye (1.4%).

The above treatment protocol, repeated if necessary, appears relatively safe and effective at lowering IOP long-term.

References