Cryoapplication in diabetic retinopathy

A.S.M. Lim & B.C. Ang
Singapore

Keywords: diabetic retinopathy, cryoapplication, cataract, vitreous hemorrhage, vitreo-retinal fibrosis

Abstract

Thirty-five patients with diabetic retinopathy were treated with cryoapplication. This was used as an alternative to Argon laser or Xenon photocoagulation because the media was opaque from vitreous hemorrhage or cataract. It was difficult or impossible to treat with photocoagulation.

The clinical impression indicates that cryoapplication is effective, showing adequate pigmentation and chorioretinal scarring with regression of diabetic retinopathy changes. However patients with vitreo-retinal fibrosis became frequently worse weeks later. This is considered a contraindication.

The use of cryoapplication in diabetic retinopathy is recommended in situations where the ocular media is not clear, such as vitreous hemorrhage and cataract. It can also be used if there is difficulty with laser photocoagulation following lens implantation.

It may be valuable in some developing countries where photocoagulation is not available. Cryomachines are frequently used in eye camps. It is inexpensive and does not necessarily require electricity.

Introduction

It is now well established that Argon laser or Xenon photocoagulation are both effective in the treatment of diabetic retinopathy (3, 4, 9). However, there are situations when laser or Xenon photocoagulation could not be used because of opacity in the ocular media especially from cataract and vitreous hemorrhage (1, 2, 5). Although it is possible to clear the media with vitrectomy or remove a cataract, in selected cases, cryoapplication was used instead. This is a study of 40 cases done over 5 years.

Selection of patients

Patients were selected for cryoapplication when the vision was satisfactory to the patient, usually 6/18 to 6/36, but the diabetic retinopathy required treatment. Most cases had preproliferative changes.

It was felt that removal of the cataract will not benefit the patient visually and that vitrectomy may lead to more serious complications (6, 8) especially if the vitrectomy was combined with cataract extraction (which gives a high incidence of rubeosis iridis). As expected, the number of cases generally was small. The vast majority of diabetic retinopa-
Table 1. Argon laser photocoagulation in diabetics and non-diabetics 1980–1984 (October).

<table>
<thead>
<tr>
<th>Type</th>
<th>No. of cases</th>
<th>No. of eyes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetic retinopathy</td>
<td>424 (48.62%)</td>
<td>697 (59.83%)</td>
</tr>
<tr>
<td>Retinal tear</td>
<td>191 (21.91%)</td>
<td>198 (16.99%)</td>
</tr>
<tr>
<td>Central serous retinopathy</td>
<td>84 (9.63%)</td>
<td>86 (7.39%)</td>
</tr>
<tr>
<td>Glaucoma</td>
<td>57 (6.54%)</td>
<td>64 (5.49%)</td>
</tr>
<tr>
<td>Retinal vein occlusion</td>
<td>61 (6.99%)</td>
<td>63 (5.41%)</td>
</tr>
<tr>
<td>Senile macular degeneration</td>
<td>15 (1.72%)</td>
<td>15 (1.28%)</td>
</tr>
<tr>
<td>Eales’ disease</td>
<td>9 (1.03%)</td>
<td>10 (0.85%)</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>31 (3.55%)</td>
<td>32 (2.75%)</td>
</tr>
<tr>
<td>Total</td>
<td>872 (100%)</td>
<td>1165 (100%)</td>
</tr>
</tbody>
</table>

thy patients were treated with laser photocoagulation (Table 1); others were treated with posterior vitrectomy, with or without cataract extraction.

Techniques

The technique is simple. A conjunctival incision is made 4 mm from the limbus and the Tenon capsule opened with scissors to expose the sclera. This ensures that the probe can be applied easily to the eyeball posterior to the equator.

Full dilation is important and usually Mydriacyl 1% and 10% Phenylephrine, is applied, 3 drops every 5 minutes, half hour before surgery. The diabetic pupil dilates well with phenylephrine.

About 10, sometimes 12 cryoapplications are made per quadrant, going as far back as possible, but avoiding being too near the disc or the macula. At each session two quadrants are treated. The iceball is seen with the indirect ophthalmoscope for 2 seconds and not exceeding 3 seconds.

Results

From 1980 to 1985, 40 eyes were treated of which the visual acuity of 17 patients (42.5%) improved, 18 (45%) remained the same and 5 (12.5%) got worse (Table 2). We then analysed those who got worse and found that where there was preoperative fibrosis, the fibrosis frequently got rapidly worse (Table 3). Out of 6 eyes with pre-operative fibrosis, 3 (50%) got worse within a month of treatment. In 2 eyes (33.3%) the fibrous tissue got worse but the vision remained the same. Only 1 got better and this was the eye with minimal fibrosis.

Thirty-four eyes did not have pre-operative fibrosis Table 4, 16 (47%) got better, 16 (47%) remained the same and 2 got worse.

Discussion

The use of cryoapplication in diabetic retinopathy is not new. It has been previously reported.

It is particularly useful in eyes where the ocular media is not clear, as in vitreous hemorrhage and/or cataract (7, 11). More recently, after extracapsular cataract extraction, with or without lens implantation, there is often an adhesion between the edge of the anterior capsule with the posterior capsule. A dense fibrous ring of the posterior capsule is