ABSTRACT

Purpose: To report a new technique to explore peripheral vitreous-retinal tractions in patients with acute posterior vitreous detachment.

Material and methods: A population of 65 patients with acute posterior vitreous detachment was studied by panfundusscopic SLO 230 lens and HRA-II to detect peripheral retinal tears and vitreous-retinal tractions.

Results: In our study, using indirect ophthalmoscopic exploration, we identified eleven patients with at least one retinal tear. HRA-II combined with the Staurenghi SLO 230 lens was capable of detecting 100% of these lesions. In addition, by means of this technology, we identified dark retinal zones that corresponded to peripheral retinal traction in six patients. None of the 65 patients complained of pain or photophobia during the exploration with this contact lens. Retinal tears and peripheral vitreous-retinal traction were treated by argon laser photocoagulation to create a firm chorioretinal adhesion. In two patients we found new retinal tears in the follow-up, with these new lesions detected by indirect ophthalmoscopy and HRA-II with SLO 230 lens.

RESUMEN

Objetivo: Comunicar una nueva técnica de exploración de la retina periférica en pacientes con desprendimiento agudo de vítreo posterior.

Material y métodos: En una muestra de 65 pacientes diagnosticados de desprendimiento agudo de vítreo posterior se estudia la retina periférica mediante el HRA-II combinado con la lente panfunduscópica de Staurenghi SLO 230. El objetivo de esta técnica es la detección y localización de desgarros retinianos y de tracciones vítreo-retinianas.

Resultados: En nuestro estudio, utilizando la oftalmoscopia indirecta con indentación escleral encontramos en 11 pacientes al menos un desgarro retiniano. El HRA-II combinado con la lente de campo amplio fue capaz de detectar el 100% de dichas lesiones. Además, mediante esta técnica, se pudo localizar en 6 pacientes áreas de tracción vítreo-retiniana, mostradas como zonas oscuras en la imagen infrarroja de fondo de ojo. Ninguno de los 65 pacientes refirió dolor ni fotofobia durante la exploración con esta lente de contacto. Los desgarros retinianos y las áreas de tracción fueron tratados con fotocoagulación con láser argón creando una...
INTRODUCTION

The annual prevalence of regmatogenous retina detachment (RRD) ranges between 10 to 15 cases for 100,000 inhabitants (1,2). Of these, 20% have been intervened for cataract surgery and 10% are the consequence of ocular traumatism (3-5).

Some of the events which are the precursors of a RRD are the posterior vitreous detachment (PVD), symptomatic retinal tears, non-symptomatic retinal tears and lattice degenerations. Approximately 15% of patients with PVD exhibit retinal tear in the initial exploration (6). Patients with PVD without initial retinal tear have a 2-5% risk of developing a tear in the first few days after the onset of the conditions. Half of patients with untreated symptomatic retinal tear will develop a regmatogenous retina detachment (7,8). This risk is reduced to 5% if the retinal tear is treated in its initial stages (9).

When exploring patient with suspected regmatogenous lesions, it is essential to examine the peripheral retina. There are no symptoms allowing to differentiate a PVD with retinal tear from a PVD without said tear. Accordingly, this exploration is a requirement (10). The method of choice for evaluating a peripheral vitreoretinal pathology is indirect ophthalmoscopy combined with scleral depression, which can be supplemented with the use of contact lenses with mirrors. If it is impossible to assess the peripheral retina, a mode-b echography is indicated to discard retinal tears or detachment as well as looking for other causes of vitreous hemorrhage (10).

Confocal laser ophthalmoscopy (SLO) produced high resolution dynamic images of the retina. With a contact lens system, it is possible to increase the SLO conventional exploration range from 30-55º up to 150º, facilitating a dynamic evaluation of the peripheral retina.

We studied the possibility of utilizing said angiograph in combination with the panfunduspic lens to assess the peripheral retina looking for traction areas susceptible of being treated to avoid a possible retinal tear and subsequent retina detachment.

SUBJECTS, MATERIAL AND METHODS

In order to assess the feasibility of this technique we made a study in patients diagnosed with acute posterior vitreous detachment without retina detachment. The patients were from the ophthalmological emergencies service of the General Hospital La Mancha Centro (Alcázar de San Juan), who underwent a full ophthalmological exploration comprising visual acuity, intra-ocular pressure, anterior pole biomicroscopy and central-peripheral retina study via indirect ophthalmoscopy combined with scleral indentation. Finally, a panfunduspic exploration with infrared laser was performed.

The Heidelberg retinal angiograph was utilized (HRA-II; Heidelberg Engineering GMBH, Dossenheim, Germany) with an 835 nm wavelength laser to obtain infrared images of the peripheral retina.
together with a wide field contact lens (Ocular Stau-
renghi 230 SLO Retina Lens; Ocular Instruments
Inc, Bellevue, Wash). This lens comprises two
biconvex spherical lenses and two convex-concave
contact elements. It has a magnification of 0.23 and
is afocal when utilized with gonioscopic gel. All the
patients were assessed under pharmacological
midriasis and after instilling a drop of topical anes-
thetic, the wide field lens is placed in contact with
the cornea utilizing gonioscopic gel. With an infra-
red wavelength laser, the entire peripheral retina of
the patient is explored as the movement of the
angiograph headpiece allows access to areas in the
extreme retinal periphery. The areas with vitreo-
retinal traction or where the retina is in a different
plane (as occurs with retinal tears) are seen as dark,
while the rest of the healthy retina displays a light
gray color.

RESULTS

Utilizing the HRA-II and wide field lens, we stu-
died 65 patients diagnosed with acute PVD. The
demographic characteristics of said patients are
seen in Table 1. In all the patients it was possible to
visualize the vitreous gel mobile and detached
floating in the vitreous cavity by means of the
dynamic exploration with the wide field lens. Of
the 65 patients, 11 exhibited at least one retinal
tear, made visible with indirect ophthalmoscopy
under indentation as well as with infrared explo-
ration with the wide field lens (figs. 1 and 2). In
addition, by means of the latter technique it was
possible to observe dark areas in 6 patients, which
corresponded to retinal areas tractioned with vi-
treous streaks, verified with a subsequent explo-
ration with a three-mirror Goldmann lens (fig. 3).
None of the 65 patients referred pain due to ex-
ploration with a wide field lens or photophobia
during the test. When a retinal tear or a vitreo-reti-
nal traction zone was found, the patient was treated

Table I. Demographic data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age</td>
<td>62.37 ± 8.96</td>
</tr>
<tr>
<td>Women</td>
<td>53.84% (35/65)</td>
</tr>
<tr>
<td>Men</td>
<td>46.16% (30/65)</td>
</tr>
<tr>
<td>Mean refraction</td>
<td>-2.25 ± 1.57 dp</td>
</tr>
<tr>
<td>Phakic</td>
<td>80% (52/65)</td>
</tr>
<tr>
<td>Pseudo-phakic</td>
<td>20% (13/65)</td>
</tr>
</tbody>
</table>

with argon laser in order to create a chorioretinal
adhesion to avoid progression to retina detach-
ment. All the patients who did not exhibit any alte-
ration except acute PVD were assessed again one
month after the initial episode, without finding new
regmatogenous lesions in any. The patients who
received argon laser were reassessed 2 weeks later,

Fig. 1: HRA-II identifies two peripheral retinal tears
with associated retina detachment (white arrows) in a
patient with hemorrhagic PVD (arrow head).

Fig. 2: Superior temporal tear (white arrow) in pseudo-
phakic patient assessed with SLO 230 lens.
with retinal tears found in 2 of them, which were treated accordingly (fig. 4).

**DISCUSSION**

Early diagnosis and subsequent treatment of acute retinal tears reduces the amount of patients who progress to a retinomatosous retina detachment (9). However, in some occasions a RRD can arise in spite of the appropriate treatment with laser or cryotherapy. Up to 10-16% of treated cases develop secondary retinal tears in vitreo-retinal traction zones (9). This is particularly important for pseudophakic patients who have a higher frequency of development of new retinal tears and therefore of retreatments (9). Accordingy, it is crucial to perform in these patients a full peripheral retina exploration, detecting the retinal traction zones. It is a requirement in patients with acute posterior vitreous detachment to explore the peripheral retina with scleral indentation (10). However, said exploration is frequently painful for the patient, and the ophthalmologist may also undervalue the predisposing zones. Exploration with SLO equipped with panfundusscopic lens can be of help in these cases as a supplementary exploration to scleral indentation. In this test it is possible to visualize the retinal tears or vitreous traction zones as dark areas, clearly distinguishable from the light grey of the remainder of the retina. SLO is based on the use of a laser beam focus on a specific retinal plane. We believe that, when the retina is in a more anterior position due to the vitreous traction, an unfocusing effect arises and it is displayed as a darker area. In fact, if we change the focus to a more anterior plane, the dark color disappears and the detached retinal flap acquires the same grayish color as the applied retina.

In our opinion, this test provides two advantages for the patients diagnosed with acute posterior vitreous detachment. First, it confirms and supplements the findings of indirect ophthalmoscopy with scleral indentation, detecting retinal tears and possible traction zones. Second, it is recorded in digital format which allows the specialist to show the patient and his relatives the peripheral retinal lesions, even in dynamic form. In this way, the patient is able to better understand the process affecting his eyesight as well as its treatment.

In addition, at present there are several systems for obtaining wide field retinal images in this exploration. There is a wide field system based on two-color...
Exploration retina peripheral with HRA-II

SLO technology, Panoramic200 (Optos plc, Dunfermline, Scotland) with lower resolution than SLO angiographic systems. Other non-SLO wide field systems utilize an ophthalmoscopic contact lens combined with trans-scleral lighting for adults (Panoret 1000; Medibell Ltd, Haifa, Israel) or with transpupillary lighting for pediatric patients (RetCam II; Massie Research laboratories Inc, Dublin, Calif. USA).

In combination with the panfunduscopic Stau-renghi 230 lens, the HRA-II can be utilized in adults and children although the lens could be slightly big for smaller children. It is also useful in aphakic and pseudophakic patient and, as it utilizes an infrared laser, it can be particularly adequate for patients with slight medium opacities such as cataracts and not very dense vitreous hemorrhages.

In our study we have shown how the utilization an HRA-2 together with a wide field system (Stau-renghi SLO 230 lens ) can supplement the exploration of patients with acute posterior vitreous detachment and assist in the detection of tractional areas which could cause retinal tears.

REFERENCES