Short communication

Excimer laser assisted Descemet stripping endothelial keratoplasty in iridocorneal endothelial syndrome

A. Capote, T. Cárdenas*, D. Cruz, I. Hernández

Instituto Cubano de Oftalmología Ramón Pando Ferrer, La Habana, Cuba

ABSTRACT

Case report: A 42-year-old female diagnosed with essential iris atrophy complained of visual decrease in the right eye. Examination revealed moderate corneal edema, folds in Descemet’s membrane, polyopia, corectopia, and iris atrophy. Excimer laser assisted Descemet stripping endothelial keratoplasty was performed, with a good corneal transparency and a significant visual improvement being obtained.

Discussion: The results one year after the surgery, with visual acuity of 0.4, clear lens, pachymetry of 580 µm and cylinder of 0.5 D, with low endothelial cell loss, suggest that further studies are required to evaluate the efficacy of this technique in patients with iridocorneal endothelial syndrome.

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Queratoplastia endotelial con pelado de la Descemet asistida con láser de excímero en el síndrome iridocorneoendotelial

RÉSUMEN

Caso clínico: Paciente femenina de 42 años con atrofia esencial de iris con disminución de la visión del ojo derecho, edema corneal moderado con pliegues en la membrana de Descemet, policoria, corectopia y atrofia iridiana. Se realizó queratoplastia endotelial con pelado de la Descemet asistida con láser de excímero obteniendo buena transparencia corneal y recuperación visual.

Discusión: Los resultados al año, con agudeza visual de 0.4, conservación de la transparencia del cristalino, pachimetría de 588 µm y cilindro de 0.5 D, con baja pérdida endotelial alientan la realización de un estudio que valore la eficacia de la técnica en el síndrome iridocorneoendotelial.

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* Corresponding author.
E-mail address: taimcar@infomed.sld.cu (T. Cárdenas).
Introduction

The iridocorneal endothelial syndrome (ICES) comprises 3 clinical variants: progressive or essential atrophy of the iris, in which iridian alterations predominate; Chandler’s syndrome with predominance of corneal alterations and the Cogan-Reese syndrome with iridian nodules. In all these, endothelial dysfunction is common and could evolve to glaucoma, corneal decompensation or both. It is an infrequent, known hereditary and acquired disorder which more frequently expresses unilaterally in middle-aged women. The pathognomic signs of ICES are: corectopia, pseudopolycoria, and Iris atrophy, engraved silver-looking corneal endothelium and corneal edema.1

Traditionally, penetrating keratoplasty has been recommended but with the development of posterior lamellar keratoplasty it is now possible to make a selective transplant of involved tissue. Reports comprise only isolated cases or small series of patients with ICES treated with endothelial keratoplasty.2,3

Case report

A female patient, aged 42 years, during one year, had experienced progressive vision reduction in the right eye (RE). Uncorrected visual acuity (UnVA) in RE was 0.05 and in the left eye (LE) 0.2. Visual acuity with correction (AVc) was of

Fig. 1 – Presurgery biomicroscopic examination.

Fig. 2 – (A) Presurgery images: disorganized and edematized epithelium with cysts. Beehive subepithelial and lacunar stromal edema, diminished normal keratocytes. No endothelial pattern. (B–D) Post surgery images of the cornea in confocal microscopy after one and 6 months and one year. The epithelium is better defined, keratocytes are activated and edema has diminished. Endothelium and disk keratocytes are normal.
+5.50–3.50 × 95 reaching a vision of 0.16 in RE and in LE, 1.0 con +6.25–2.00 × 80. Intraocular pressure was 14.0 mmHg and 13.0 mmHg in RE and LE, respectively. The RE exhibited moderate diffuse epithelial and stromal corneal edema, Descemet folds, corectopia, pseudopolycoria, iridial atrophy, uveal ectropion and peripheral anterior synechiae (Fig. 1). The RE had an axial length of 20.53 mm with anterior chamber depth (ACD) of 2.91 mm; the LE of 19.72 mm, had ACD of 3.10 mm. Central pachymetry in the RE was 610 μm against 534 μm in LE.

Confocal microscopy (CS4; NIDEK Technologies, Padova, Italy) (Fig. 2) in RE showed signs of chronic edema. In the LE this was normal with endothelial density of 2225 cells/mm².

Essential iris atrophy was diagnosed and endothelial keratoplasty was planned with Descemet peeling assisted by Excimer laser Se (EL DSEK) in RE.5

The donor cornea (2.785 cells/mm²) was carved in an artificial anterior chamber (Coronet, NetWork Medical Products Ltd., Ripon, United Kingdom) using Excimer laser (Esiris, Schwind Eye-Tech Solutions GmbH, Kleinostheim, Germany) in the phototherapeutic keratectomy mode under pachymetry monitoring to produce a base of 100 μm at 150 μm. The carving was made from the endothelial side with a 8.5 mm punch. Under topical anesthesia (tetracaine chlorhydrate 0.5%) the Descemet endothelial complex was peeled at a diameter of 8.0 mm. The graft was introduced through a 4.0 mm corneal incision, centered and fixed with large air bubble in the anterior chamber (Fig. 3).

24 h later the cornea exhibited improved transparency and the disk was adequately centered. Topical treatment was prescribed with prednisolone, hypertonic sodium chloride and gatifloxacin at 3 h intervals. One month later the cornea and graft remained transparent and well adhered, with improvements after 6 months and one year (Fig. 4).

Intraocular pressure remained within normal values (11–12 mmHg). Refraction varied, improving corrected visual acuity. At month 1, +5.25–4.00 × 90° (0.2), at month 6 +4.00–1.00 × 35° (0.4) and at one year +2.50–0.50 × 35° (0.4).

At month 1, central pachymetry was 631 μm and diminished at month 6 to 596 μm and at year 1 to 588 μm (Fig. 5).

At year 1, corneal volume (82.7 mm³), compared with the contralateral cornea (61.4 mm³) was 25.76% larger. Confocal microscopy (Fig. 2) showed a satisfactory recovery of the cornea.

Discussion

In the present case with ICES, a positive morphological result was obtained by means of DSEK, considering the corneal transparency and the confocal microscopy study, as well as significant visual gain after one-year follow-up. In 3 eyes with ICES operated of DSCK, Price1 obtained corrected visual acuity between 20/20 and 20/30 with a mean cylinder of 1.2 D. Bahar3 reported obtaining good visual results in a patient with ICES after performing DSAEK.

Surgery was carried out in the presence of a transparent lens and therefore was not combined with phacoemulsification. Densitometry showed that transparency was maintained. Only one previous publication by Huang et al.5 was found reporting DLEK in 7 phakic patients with ICES who obtained significant visual acuity gains, a mean endothelial density of 1917 cells/mm² and with the appearance of cataracts in 2 eyes within a 20 month period. Opacification of the lens after corneal transplants is frequently reported.

Laser carving produces a disk with the precise thickness and an acceptable corneal volume increase and diminished ACD volume (RE 75 mm³, LE 115 mm³) and is more predictable than with the manual and automated dissection.
techniques. This is of significant importance in cases such as the one reported in this paper, with small and phakic eyes. In this patient EL DSEK was effective for treating the chronic edema associated to ICES but more data are necessary to draw conclusions about the efficacy of said treatment in this syndrome.

**Conflict of interests**

No conflict of interests has been declared by the authors.

**REFERENCES**