

# Comparing the outcomes and complications of protected and unprotected penetrating keratoplasty in treating chronic pseudophakic corneal edema

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<b>Registration date</b> 02/08/2023	<b>Overall study status</b> Completed	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
<b>Last Edited</b> 02/08/2023	<b>Condition category</b> Eye Diseases	<input type="checkbox"/> Individual participant data <input type="checkbox"/> Record updated in last year

## Plain English summary of protocol

### Background and study aims

Penetrating keratoplasty is a surgical procedure where a damaged or diseased cornea (the clear outer layer at the front of the eye) is replaced by donated corneal tissue. This study aims to assess and compare the outcomes of patients who underwent penetrating keratoplasty following the development of chronic corneal edema (buildup of fluid) resistant to medical treatment after cataract surgery.

### Who can participate?

Adult patients (aged 18 years and older) who have undergone cataract surgery and subsequently developed chronic corneal edema resistant to medical treatment in one eye

### What does the study involve?

Participants are grouped according to whether they underwent protected or unprotected penetrating keratoplasty. Assessments of visual acuity, endothelial cell count, intraocular pressure, and anterior segment examination will be conducted before and after surgery. Complications will also be recorded, and participants will fill out a questionnaire about their quality of life at baseline and 1 year after the operation.

### What are the possible benefits and risks of participating?

Participants may benefit from more thorough monitoring of their health status, earlier detection of any complications, and potentially improved treatment outcomes. Risks include those associated with the surgical procedures, plus the slight discomfort of additional examinations and time commitment for follow-up visits.

### Where is the study run from?

Hospital Hermanos Ameijeiras (Cuba)

When Is the study starting and how long is it expected to run for?  
August 2017 to December 2021

Who is funding the study?  
Hospital Hermanos Ameijeiras (Cuba)

Who is the main contact?  
Dr Tian Yang, [fabian.yangtian@gmail.com](mailto:fabian.yangtian@gmail.com)

## Contact information

**Type(s)**  
Scientific

**Contact name**  
Dr Tian Yang

**ORCID ID**  
<https://orcid.org/0000-0001-5337-1938>

**Contact details**  
I Street #409, between 19th and 21st Streets  
Vedado, Revolution Square  
Havana  
Cuba  
100400  
+86 (0)13709519133  
[fabian.yangtian@gmail.com](mailto:fabian.yangtian@gmail.com)

## Additional identifiers

**Clinical Trials Information System (CTIS)**  
Nil known

**ClinicalTrials.gov (NCT)**  
Nil known

**Protocol serial number**  
Nil known

## Study information

**Scientific Title**  
"Open sky" penetrating keratoplasty versus simultaneous penetrating and lamellar keratoplasty for pseudophakic bullous keratopathy

**Study objectives**  
When a protected penetrating keratoplasty is performed, there is improved best-corrected visual acuity (BCVA), reduced risk of an "open sky" scenario, higher probability of preserving the

intraocular lens in the posterior chamber, and less corneal endothelial cell loss compared to traditional penetrating keratoplasty (unprotected penetrating keratoplasty).

### **Ethics approval required**

Ethics approval required

### **Ethics approval(s)**

approved 22/02/2018, Cuban Medical Ethics Committee (San Lázaro 701 between Belascoain and Marqués González, Havana, 10400, Cuba; +86 (0)537 8761210; yudith@hha.sld.cu), ref: 000

### **Study design**

Single-center cross-sectional descriptive observational study

### **Primary study design**

Observational

### **Study type(s)**

Quality of life, Treatment

### **Health condition(s) or problem(s) studied**

Patients with a diagnosis of irreversible pseudophakic chronic corneal edema who required penetrating corneal transplantation due to failure to improve with other medical treatments

### **Interventions**

Participants in this study undergo either an unprotected or protected partial penetrating keratoplasty to treat chronic pseudophakic corneal edema.

Upon enrolment, patient data is gathered from medical histories and participants are assigned to either the unprotected or protected keratoplasty groups. Preoperative and postoperative evaluations are conducted using various ophthalmic diagnostic tools and techniques, including Snellen E Optotype, Zeiss SL 20 Slit Lamp, and Topcon SP-3000P specular microscope.

The surgical procedure involves general anesthesia, insertion of a lid speculum, application of a Flieringa scleral fixation ring, corneal incisions and keratoplasty. Donor corneas processed in accordance with APABO (Pan American Association of Eye Banks) standards are used for transplantation. The storage duration of the cornea is 3 to 5 days and endothelial cell density is more than or equal to 2,500 cells/mm<sup>2</sup>. The graft diameter is 7.5 mm for the recipient and 8.0 mm for the donor in both groups.

Postoperative care includes topical antibiotic and anti-inflammatory treatments, with varying regimens over a 6-month period. Artificial tears are also administered for 6 months.

Follow-up appointments are scheduled weekly during the first 2 months and bi-monthly until the end of 1 year when the study concludes. In these visits, transplant status, suture condition, medication tolerance, and complications are assessed. All patients also undergo a conclusive endothelial count through specular microscopy at the end of the year.

The total observation period of this study is 1 year from the surgery, and this also constitutes the duration of follow-up.

### **Intervention Type**

## Procedure/Surgery

### Primary outcome(s)

1. Visual acuity assessed using the Snellen E chart at baseline (preoperative), immediately postoperative, and at the follow-up visits scheduled weekly for the first 2 months, then every 2 months until completion of 1 year.
2. Endothelial cell count of the donor pre and post transplants is measured using specular microscopy (Topcon SP-3000P) at baseline (preoperative) and 1 year postoperative.

### Key secondary outcome(s)

1. Intraocular pressure is measured using a pneumatonometer preoperatively and postoperatively at each follow-up visit scheduled weekly for the first 2 months, then every 2 months until completion of 1 year.
2. Condition of the transplant, transparency, status of sutures, and tolerance to medication, evaluated by anterior segment biomicroscopy at each follow-up visit scheduled weekly for the first 2 months, then every 2 months until completion of 1 year.
3. Any intraoperative, immediate, and late complications are recorded and managed appropriately. The complications are evaluated at each follow-up visit scheduled weekly for the first 2 months, then every 2 months until completion of 1 year.
4. Postoperative medication tolerance evaluated by the patient's reported symptoms and by clinical evaluation during each follow-up visit scheduled weekly for the first 2 months, then every 2 months until the completion of 1 year.
5. Quality of life assessed using an NEI VFG-25 scale covering aspects like vision-related daily life activities, discomfort, and overall satisfaction with the treatment at baseline and at 1 year postoperative.

### Completion date

28/12/2021

## Eligibility

### Key inclusion criteria

1. Patients operated on for cataracts who developed chronic corneal edema resistant to medical treatment in an eye with some visual possibility
2. Written informed consent to participate in the research

### Participant type(s)

Patient

### Healthy volunteers allowed

No

### Age group

Adult

### Lower age limit

18 years

### Upper age limit

100 years

**Sex**

All

**Total final enrolment**

43

**Key exclusion criteria**

1. Refusal of the patient to undergo another surgical treatment or not having the possibility of vision

**Date of first enrolment**

01/03/2018

**Date of final enrolment**

31/12/2019

**Locations****Countries of recruitment**

Cuba

**Study participating centre**

**Hospital Clínico Quirúrgico Hermanos Ameijeiras**

San Lázaro 701 between Belascoain and Marqués González

Havana

Cuba

10400

**Sponsor information****Organisation**

Universidad de Ciencias Médicas de la Habana

**ROR**

<https://ror.org/04kgp9g48>

**Funder(s)****Funder type**

Hospital/treatment centre

**Funder Name**

## Results and Publications

### Individual participant data (IPD) sharing plan

The datasets generated during and/or analysed during the current study will be available upon request from Tian Yang (fabian.yangtian@gmail.com). This includes anonymised data pertaining to patient demographics, preoperative and postoperative measures of visual acuity, endothelial cell count, intraocular pressure, as well as records of complications and outcomes of quality-of-life questionnaires. The data will become available following the publication of the study's main results, and it will remain accessible for a period of five years. Access to the data will be granted for purposes of peer review, replication of analyses, meta-analyses, and for the development of further research questions and hypotheses. Data access requests will be reviewed by Dr Tian Yang, and will be granted to verified researchers, academics, and healthcare professionals, who must commit to using the data for the specified purposes only, and to maintaining the confidentiality of the data. Data sharing will be executed via a secure online data repository or through encrypted email transmission, depending on the preference and capabilities of the recipient. Participants' consent for the anonymisation and sharing of their data was obtained as part of the study's informed consent process. All data will be fully anonymised before sharing, with all direct and indirect identifiers removed to protect participants' privacy and confidentiality. There are no ethical or legal restrictions on data sharing noted. Any other comments or requests for clarification regarding the data should be directed to Dr Tian Yang at fabian.yangtian@gmail.com.

### IPD sharing plan summary

Available on request