ISRCTN10578843 https://doi.org/10.1186/ISRCTN10578843

Corneal transplant clinical trial

Submission date	Recruitment status	[_] Prospectively registered
03/01/2020	No longer recruiting	[X] Protocol
Registration date	**Overall study status**	[_] Statistical analysis plan
08/01/2020	Completed	[X] Results
Last Edited	**Condition category**	[_] Individual participant data
08/11/2022	Eye Diseases	

Plain English summary of protocol

Background and study aims
The cornea is the transparent front part of the eye. Disorders of the cornea can result in scarring and a loss of transparency leading to loss of vision (corneal opacification). This is a significant cause of blindness in the UK and remains the second most common cause of blindness in the developing world. Recent innovations in corneal transplant techniques (endothelial keratoplasty) have shown significant benefit to patients. The donor cornea can be prepared using two techniques, either by hand or by using a machine to cut away the cornea. To date, there have been no satisfactory studies comparing the two methods. The aim of this study is to compare the methods using a randomised controlled trial.

Who can participate?
Patients aged 18 years or above with visual compromise due to loss of corneal transparency.

What does the study involve?
Patients will be allocated to one or the other surgical technique and outcomes will be closely observed over the course of 1 year that would involve 6 follow up visits. The follow up visits are the same frequency for all corneal transplant patients even if they are not part of a clinical trial.

What are the possible benefits and risks of participating?
Benefits: Contribution to scientific evidence on best treatment options for patients with corneal failure and regular follow-ups with the research team to monitor progress following corneal transplant procedure for patients.
There are no particular risks related to taking part in the trial. The clinical risks are the same for all patients undergoing corneal transplantation such as rejection, infection, failure and repeat procedures.

Where is the study run from?
Cambridge University Hospitals NHS Trust, UK

When is the study starting and how long is it expected to run for?
October 2016 to April 2020

Who is funding the study?
1. Cambridge University Hospitals, UK
2. Fight for Sight UK

Who is the main contact?
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Contact information

Type(s)
Scientific

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Additional identifiers

Integrated Research Application System (IRAS)
201097

Protocol serial number
V1200616

Study information

Scientific Title
Microthin Descemets Stripping Automated Endothelial Keratoplasty (Microthin-DSAEK) vs Descemets Membrane Endothelial Keratoplasty (DMEK) - RCT

Acronym
M-DSAEKvDMEK

Study objectives

DMEK surgery results in better visual outcomes compared to Microthin DSAEK in patients with corneal endothelial decompensation

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 02/08/2016, London - Fulham Research Ethics Committee (Barlow House, 3rd Floor, 4 Minshull Street, Manchester, M1 3DZ, UK; +44 (0)207 1048165; nrescommittee.london-fulham@nhs.net), ref: 16/LO/1343

Primary study design
Interventional

Study design
Single centre interventional double blind randomized clinical trial

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Corneal endothelial failure

Interventions
1. All patients eligible for the trial will be randomised either to the DMEK arm or MT-DSAEK (Micro thin DSAEK) arm.
2. Randomisation: One eye per patient will be randomised to either undergo MT –DSAEK or DMEK base on a paper based randomisation process led by the clinical trials unit, with an independent statistician preparing the concealment /randomisation list and sealed envelope preparation. We calculated that 28 patients in each arm will give at least 80% power to detect a 0.1 logarithm of the minimum angle of resolution (logMAR) difference (around 1 line difference or 5 letters)
3. The trial will be a double blind trial:
3.1. Patients will be unaware of what arm they are randomised to
3.2. Technicians taking measurements will be unaware of what arm patients are randomised to
3.3. Analysis of data will be conducted by an independent clinical physician who has no involvement in the care the patients
3.4. Only surgeons supervising the care of the patients will be able to see which arm the patient had been randomised to and this included the operating surgeon

Surgical intervention:

Microthin DSAEK
In Microthin DSAEK the endothelial transplant is prepared from the cadaveric human donor cornea using a mechanised microkeratome with transplant thickness varying between 70-130 microns. The DSAEK endothelial transplant consists of a monolayer of endothelial cells on the descemets membrane with posterior stromal layer. By regulating the corneal donor thickness using a stromal dehydration technique we have shown a reliable way to create an endothelial transplant thickness of 100microns with minimal variance, termed microthin DSAEK. This technique will be compared to DMEK in this trial.

DMEK
In this procedure the endothelial transplant is prepared by manual peeling of the descemets membrane, which consists of a monolayer of endothelial cells without the posterior corneal stroma measuring 15-20 microns in thickness.
Both transplants (MT-DSAEK and DMEK) are delivered to the eye using a sterile disposable surgical injecting instrument. And the attachment of the transplant to the host cornea is assisted with an air bubble in the anterior chamber.

Follow up
Patients will be followed up 1 week, 1 month, 3 months, 6 months, 9 months and 12 months following the surgical procedure.

Intervention Type
Procedure/Surgery

Primary outcome(s)
Best corrected visual acuity measured using LogMar values at 12 months

Key secondary outcome(s)
1. Visual Acuity: An optician trained in the use of ETDRS charts will check the autorefractive reading and then will measure BCVA at 3, 6 and 9 months
2. Refractive cylinder: Results will be taken with an autorefractometer 3 times or until till a consistent reading will be obtained. The last 3 results will be averaged. Refraction will be then checked manually by a trained optician when BCVA will be measured
3. Central corneal thickness: Central corneal thickness will be measured by anterior OCT. This will be performed by an experienced trained technician with all scans independently verified by a doctor not involved with the care of the patients
4. Endothelial cell density: The cell density (cells/mm^2) will be measured using specular microscopy at 6 and 12 months
5. Patient functional questionnaire: Patients will be asked to fill out a standard visual function questionnaire at each time point (VF 14) – there are 14 questions related to visual function and collected at 6 and 12 months
6. Complications: Rate of intraoperative and post-operative complications will be analysed between the two groups

Completion date
30/04/2020

Eligibility

Key inclusion criteria
1. Visual compromise due to corneal endothelial decompensation
2. Aged 18 years or above

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 Years

Sex
All

Total final enrolment
56

Key exclusion criteria
Patients with several ocular comorbidities in addition to corneal endothelial decompensation will be excluded

Date of first enrolment
01/10/2016

Date of final enrolment
31/12/2018

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Cambridge University Hospitals NHS Trust
Hills Road
Cambridge
United Kingdom
CB2 0QQ

Sponsor information

Organisation
Cambridge University Hospitals NHS Foundation Trust

ROR
https://ror.org/04v54gj93

Funder(s)

Funder type
Hospital/treatment centre

Funder Name
Cambridge University Hospitals

Alternative Name(s)
CUH

Funding Body Type
Private sector organisation

Funding Body Subtype
For-profit companies (industry)

Location
United Kingdom

Funder Name
Fight for Sight UK

Alternative Name(s)
Fight for Sight, Fight for Sight (UK)

Funding Body Type
Private sector organisation

Funding Body Subtype
Trusts, charities, foundations (both public and private)

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request. Prof. Madhavan Rajan, Consultant Ophthalmic Surgeon, Box 41, Addenbrooke's Hospital, Hills Road, Cambridge, CB2 0QQ. The data sharing plans are not defined and will be made available at a later date. However, the CI can take any enquiries for request in the mean time.

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	01/11/2020	28/01/2021	Yes	No
HRA research summary			28/06/2023	No	No
Other publications	Two-Year Report	01/12/2022	08/11/2022	Yes	No
Protocol file	version V1	20/06/2016	10/01/2020	No	No