

# Evaluation of a low-energy femtosecond laser in cataract surgery

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<b>Registration date</b> 07/08/2018	<b>Overall study status</b> Completed	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
<b>Last Edited</b> 11/09/2018	<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

Cataracts are a condition where the lens of the eye becomes cloudy, which leads to a decrease in vision. Cataracts can be treated with laser surgery, where lasers are used to tell the surgeon the correct locations of the eye to perform the surgery and remove the cataract.

A type of laser called a femtosecond laser can be used to standardise and increase the safety and accuracy of laser surgery for cataracts. Bimanual microincision cataract surgery (B-MICS) is a technique that makes the surgery less invasive, more stable and more precise. Femtosecond lasers and B-MICS therefore appear to be well-suited to use in combination. As a result, we aim to look at the safety and efficacy of combining femtosecond lasers with B-MICS during cataract surgery performed by a well-trained surgeon.

### Who can participate?

Patients aged over 50 with cataracts with nuclear sclerosis grade 2 and 3

### What does the study involve?

Participants will receive cataract surgery using either the B-MICS technique only (control group) or femtosecond laser-assisted B-MICS, depending on whether their surgery is scheduled for the day the femtosecond laser is available or not. Patients will also undergo measurements including visual acuity, corneal astigmatism and corneal thickness before the surgery and 7 days, 1 month and 3 months later. Patients will receive a follow up after 18 months to check for complications and determine the success of the surgery.

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

The possible benefit to participants of taking part is a faster recovery, due to lower endothelial damage and corneal edema. The possible risks to participants are standard risks of cataract surgery, including complications during the operation (endothelial damage, capsule breakgae or a dropped nucleus) and after the operation (infections, macular edema, intraocular lens dislocation and an increase in intraocular pressure).

### Where is the study run from?

Institute of Ophthalmology, University of Modena and Reggio Emilia, Italy

When is the study starting and how long is it expected to run for?  
January 2015 to December 2019

Who is funding the study?  
Fondazione Cassa di Risparmio di Modena (Italy)

Who is the main contact?  
Prof Gian Maria Cavallini  
gianmaria.cavallini@unimore.it

## Contact information

**Type(s)**  
Public

**Contact name**  
Prof Gian Maria Cavallini

**Contact details**  
Via Del Pozzo, 71  
Modena  
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41124

## Additional identifiers

**Protocol serial number**  
Protocol 4010/CE - Serial number 202/15

## Study information

**Scientific Title**  
Evaluation of bimanual femtosecond laser-assisted cataract surgery with low energy LDV Z8

**Acronym**  
Bimanual-FLACS

### Study objectives

The femtosecond laser was introduced in ophthalmology more than 7 years ago to assist in precision cataract surgery. This new technique offers advantages in terms of reproducibility and precision in comparison to standard phacoemulsification by helping the surgeon for the creation of microincisions, capsulotomies and nucleus fragmentation. Bimanual microincision cataract surgery (B-MICS) is a minimally invasive variant of coaxial phacoemulsification which enables microincisions of 1.4 mm. This technique is characterized by increased stability of the anterior chamber with the separation of the aspiration and the infusion probe; moreover, the small instruments give greater visibility of the surgical field. Because of the requirement of precision and small openings, the use of a femtosecond laser is well suited to be associated with minimally invasive bimanual surgery. The purpose of this study is to evaluate the safety and efficacy of bimanual FLACS with a low-energy femtosecond laser. Data are compared with outcomes of the standard B-MICS technique. Intra- and post-operative complications, together with intra- and

postoperative efficacy parameters are registered , such as visual acuity, astigmatism, corneal thickness and endothelial cell count. A long-term evaluation of the results will be investigated in particular

**Ethics approval required**

Old ethics approval format

**Ethics approval(s)**

Comitato Etico Area Vasta Emilia Nord, 23/10/2015, 202/15

**Study design**

Interventional non-randomised single-center prospective pilot trial

**Primary study design**

Interventional

**Study type(s)**

Treatment

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

Cataract

**Interventions**

After provision of written informed consent, consecutive patients with nuclear sclerosis grade 2 and 3 in the Lens Opacities Classification System III and in line for cataract surgery on the day in which the femtosecond laser was available are treated and enrolled into the current study (Group A). A control series of patients with similar baseline characteristics treated by the same experienced surgeon with standard B-MICS are selected for comparison (Group B).

**Intervention Type**

Procedure/Surgery

**Primary outcome(s)**

The following outcomes measured at the baseline, 7 days, 1 month and 3 month follow-up:

1. Best corrected visual acuity (BCVA)
2. Corneal astigmatism
3. Central corneal thickness (CCT)
4. Endothelial cell count (ECC)
5. Central macular thickness (CMT)
6. Macular pigment optical density (MPOD)

**Key secondary outcome(s)**

The following outcomes measured at the 18 month long term follow-up:

1. Intraoperative parameters
2. Intra- and post-operative complications
3. Posterior capsule opacification
4. Capsulorhexis shape

**Completion date**

31/12/2018

# Eligibility

## Key inclusion criteria

1. Over 50 years of age
2. Nuclear sclerosis grade 2 and 3 in the Lens Opacities Classification System III (LOCS III)

## Participant type(s)

Patient

## Healthy volunteers allowed

No

## Age group

Senior

## Sex

All

## Key exclusion criteria

1. Previous eye surgery
2. Complicated cataracts (e.g. hard cataracts, traumatic cataracts, pseudoexfoliation syndrome)
3. Insufficient mydriasis (less than 4 mm)
4. Concomitant eye pathologies (uveitis, glaucoma, corneal opacities, diabetic retinopathy)
5. Low endothelial cell count (less than 1500 cells/mm<sup>2</sup>)

## Date of first enrolment

01/01/2016

## Date of final enrolment

31/12/2018

# Locations

## Countries of recruitment

Italy

## Study participating centre

Institute of Ophthalmology, University of Modena and Reggio Emilia

Via Del Pozzo, 71

Modena

Italy

41124

# Sponsor information

**Organisation**

Institute of Ophthalmology, University of Modena

**ROR**

<https://ror.org/02d4c4y02>

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

Not defined

**Funder Name**

Investigator initiated and funded

**Results and Publications****Individual participant data (IPD) sharing plan**

The datasets generated during and/or analysed during the current study are/will be available upon request from Dr. Tommaso Verdina, email: [tommaso.verdina@gmail.com](mailto:tommaso.verdina@gmail.com). Data will be available for all the duration of the study and will be shared either by mail or email. Consent was obtained from all participants.

**IPD sharing plan summary**

Available on request

**Study outputs**

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Participant information sheet</a>	Participant information sheet	11/11/2025	11/11/2025	No	Yes