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# Femtosecond laser cataract surgery: Effective and average phacotome and endothelial cell loss in a contralateral, comparative study

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# IVCRC / DJ Apple Laboratory were supported by ...

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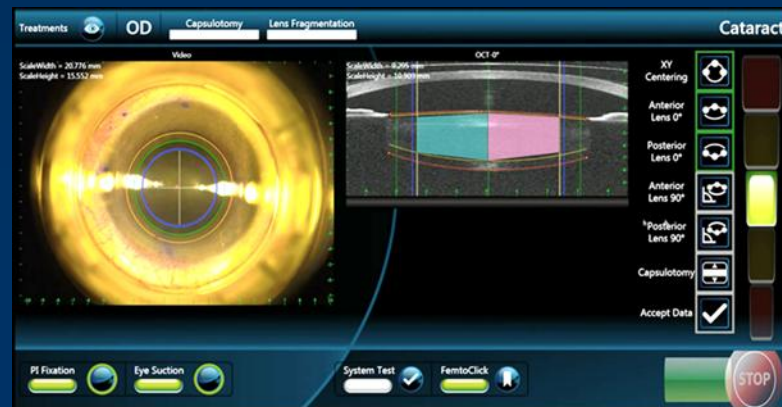
# Patients & Methods

**Study design:** Prospective, contralateral, comparing, randomized (one eye femtosecond laser, one eye manual rhexis) and investigator-masked study approved by the ethics committee

	Plan and procedure	Examination
Preoperative	30-35 patients, >18 years, bilateral cataract, no other ocular or systemic diseases to affect the results	Visual acuity (ETDRS), ECC, Allegro-Biograph, Orbscan topography, Flaremeter, Slit lamp, IOP
Intraoperative	monofocal, aspheric IOL (enVista MX60A), 6 mm diameter, power 10 - 30 D	Video recording (microscope and VICTUS laser), photo of the rhexis (stained with vision blue)
Follow up visits <ul style="list-style-type: none"> <li>- 1day</li> <li>- 1 week</li> <li>- 1 month</li> <li>- 3 months</li> <li>- 6 months</li> </ul>	so far 25 patients so far 25 patients so far 21 patients so far 18 patients so far 15 patients	Visual acuity (ETDRS), ECC, Allegro-Biograph, Orbscan topography, Zywave aberrometry, Flaremeter, Slit lamp, IOP, photo of the IOL, subjective patient evaluation (questionnaire)

## Evaluation Criteria:

Visual acuity (UDVA, CDVA), IOP, difference between intended and achieved postoperative refraction, flare, effective phacotime (EPT) and average phacotime (APT), effective IOL-Position, IOL-Overlap, IOL-Centration





# VICTUS-Phase IV Study in Heidelberg

## Workflow

Group A VICTUS™ FEMTOSECOND LASER PLATFORM Cataract procedure	Group B Manual Surgery
1 Day before surgery: Steroids and Antibiotics	
Direct before surgery: Mydriasis, Anesthesia (topical or genera)	
-----	Clear Cornea Incision (mainly no suture necessary)
-----	Tryphan Blue (mandatory)
-----	Filling anterior chamber with viscoelastica
Capsulotomy by VICTUS™ FEMTOSECOND LASER PLATFORM	Continuous curvilinear capsulorhexis (CCC)
Lens Fragmentation by VICTUS™ FEMTOSECOND LASER PLATFORM	-----
Clear Cornea Incision (mainly no suture necessary)	-----
Tryphan Blue (mandatory)	-----
Filling anterior chamber with viscoelastica	-----
Hydro-Dissection	
Maybe additional chopping	Lens Fragmentation by chopper or divide-and-conquer
Phacoemulsification (emulsification of cataract nucleus and irrigation/aspiration of fragmented nucleus)	
Polishing of posterior capsular	
IOL implantation within capsular bag (bag-to-bag)	
Direct after surgery: Steroids and Antibiotics, Miosis	

# VICTUS-Phase IV Study in Heidelberg

## Evaluation Criteria

- Visual acuity (UDVA, CDVA)
- IOP
- Difference between intended and achieved postoperative refraction
- Flare
- Effective phacotime (EPT) und average phacotime (APT)
- Effective IOL-Position
- IOL-Overlap
- IOL-Centration
- Capsulotomy-diameter
- Capsulotomy-Circularity
- Capsulotomy -Centration





# VICTUS-Phase IV Study in Heidelberg

## Currently available results: Visual Acuity

	UDVA [logMAR]		CDVA [logMAR]	
	Victus	Manual	Victus	Manual
<b>Preop (n=25)</b>	0.46* (0.94 to 0.04)	0.34* (1.04 to 0.02)	0.10 (0.80 to -0.02)	0.12 (0.82 to -0.10)
<b>1 day postop (n= 25)</b>	0.34 (1.00 to -0.04)	0.19* (0.98 to 0.02)	0.25 (0.60 to -0.04)	0.04 (0.80 to -0.10)
<b>1 week postop (n=25)</b>	0.10 (1.04 to -0.10)	0.14 (0.90 to -0.12)	0.02 (0.18 to -0.24)	-0.02 (0.38 to -0.16)
<b>1 month postop (n= 21)</b>	0.12 (0.62 to -0.10)	0.12 (0.76 to -0.10)	-0.06 (0.14 to -0.14)	-0.04 (0.10 to -0.18)
<b>3 months postop (n= 18)</b>	0.13 (0.72 to -0.12)	0.08 (0.96 to -0.20)	-0.04 (0.24 to -0.20)	-0.05 (0.16 to -0.20)
<b>6 months postop (n=15)</b>	0.14 (0.80 to -0.10 )	0.14 (0.80 to -0.12)	-0.10 (0.04 to -0.18)	-0.08 (0.06 to -0.14 )

\* 4 patients preoperatively & 1 patient after 1 day UDVA > 1.3 logMAR

No statistically significant difference between both groups (Wilcoxon test,  $p > 0.05$ )



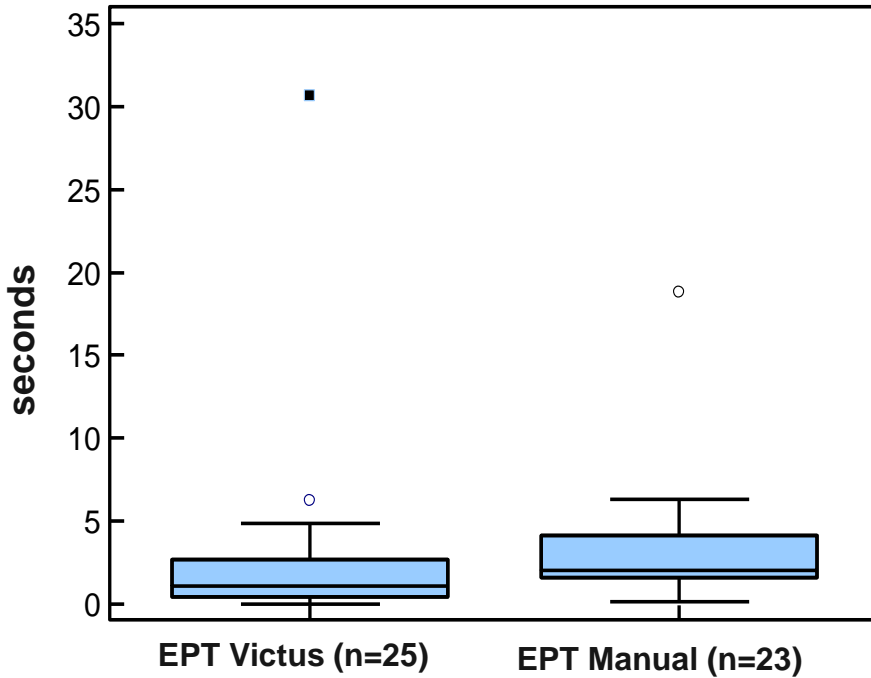
# VICTUS Phase IV-Study: Refraction

	Achieved SE [D]	
	Victus	Manual
Intended SE (n= 25)	-0.16 (-2.72 to 0.04)	-0.20 (-2.84 to 0.03)
Achieved SE 1 day postop (n= 25)	0.00 (-3.25 to 0.63)	-0.06 (-2.38 to 1.00)
Achieved SE 1 week postop (n=25)	0.00 (-2.63 to 0.75)	0.13 (-2.63 to 0.88)
Achieved SE 1 month postop (n= 21)	-0.13 (-2.63 to 1.00)	-0.13 (-2.50 to 0.88)
Achieved SE 3 months postop (n= 18)	-0.19 (-2.50 to 1.00)	-0.13 (-2.38 to 1.38)
Achieved SE 6 months postop (n=15)	-0.13 (-2.50 to 1.38)	-0.13 (-2.50 to 1.63)

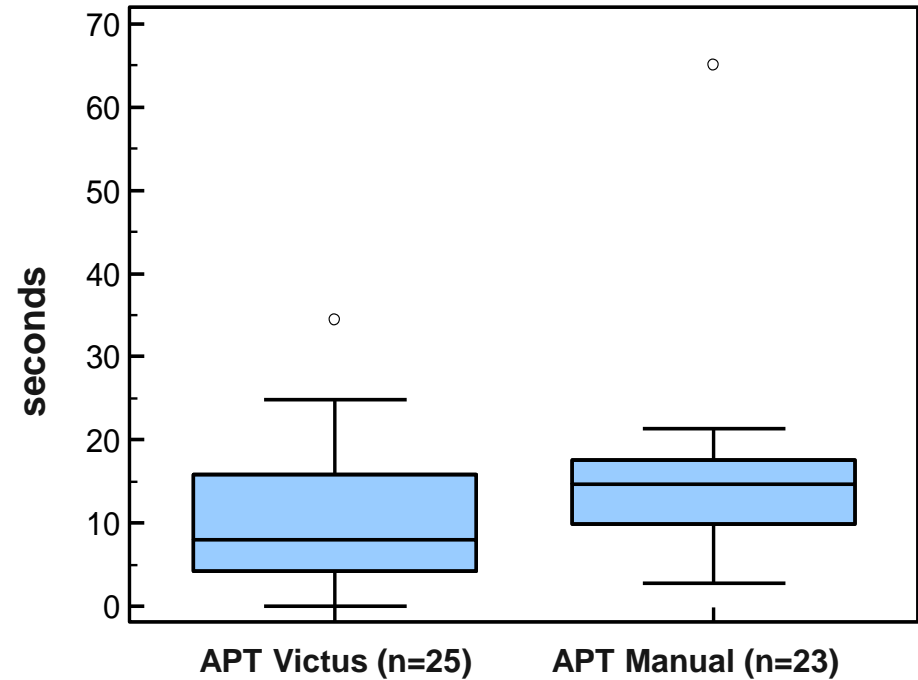
# VICTUS Phase IV-Study

## Effective phacotime (EPT) & Average phacotime (APT)

Effective Phacotime



Average Phacotime

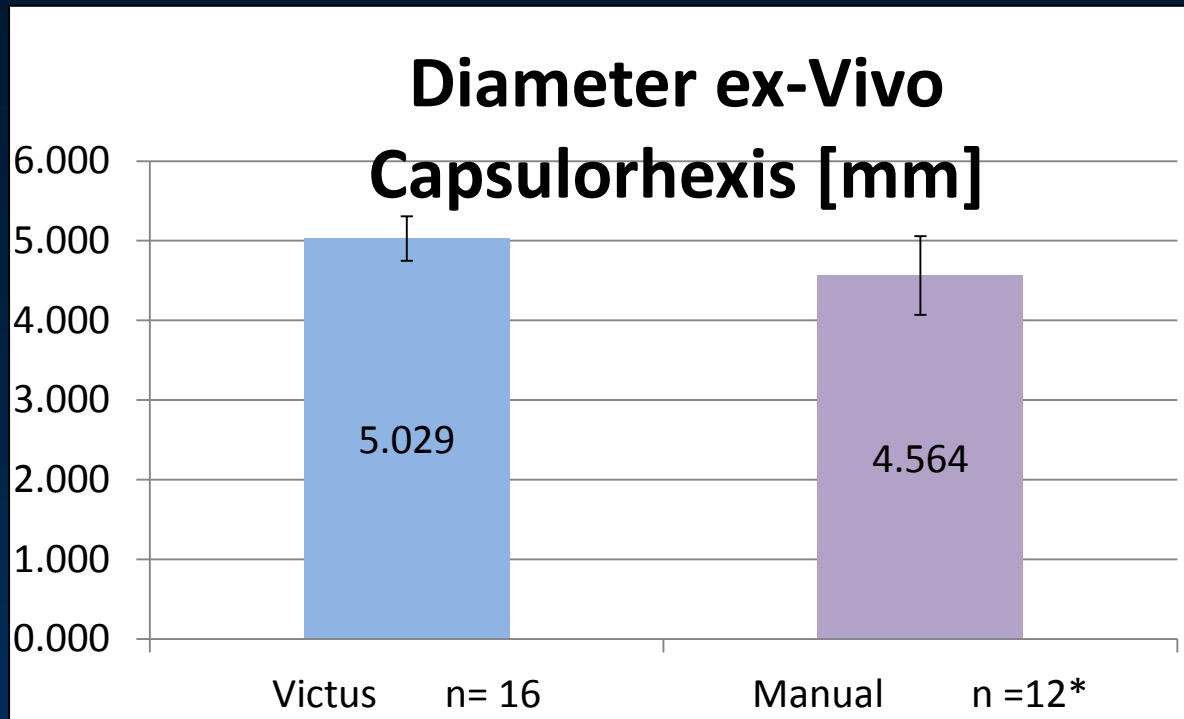


**EPT:** statistically significant difference between both groups (Wilcoxon Test,  $p = 0.0308$ )

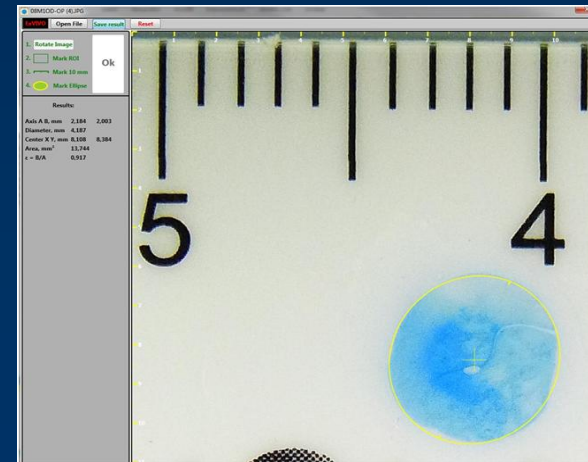
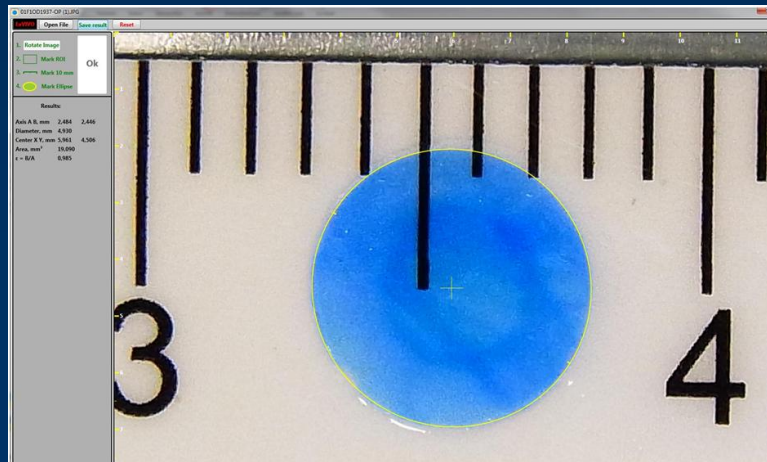
**APT:** no statistically significant difference between both groups (Wilcoxon Test,  $p = 0.1070$ )



# Diameter Capsulorhexis

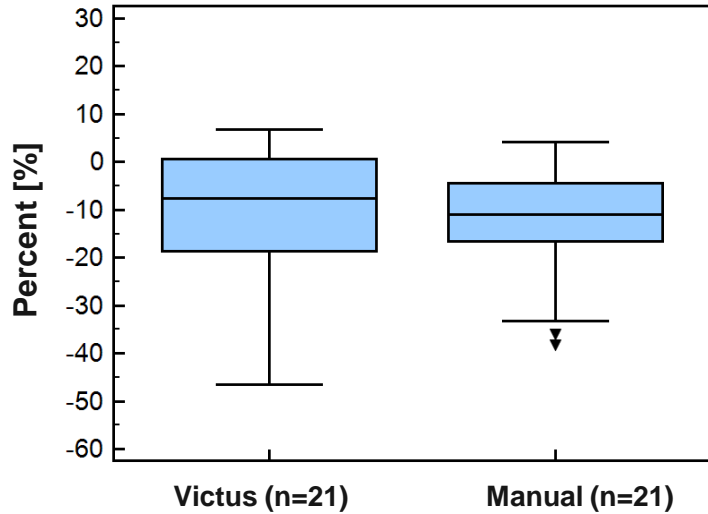


\* 4 Cases not suitable for analysis



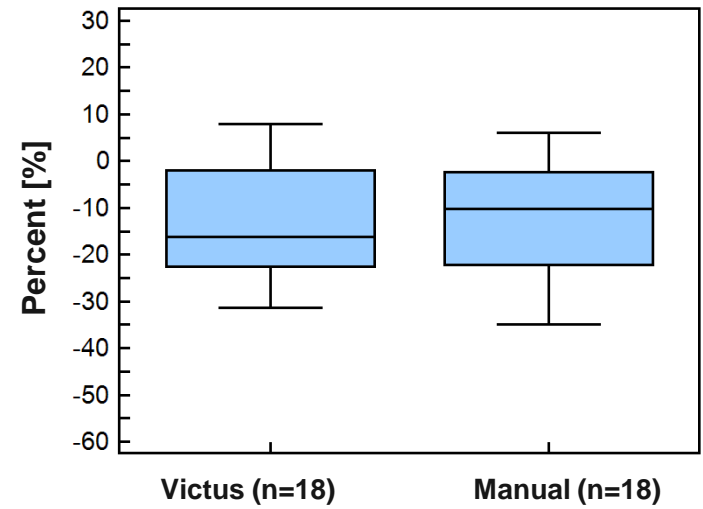
# Endothelial cell loss

## Endothelial cell loss 1 month

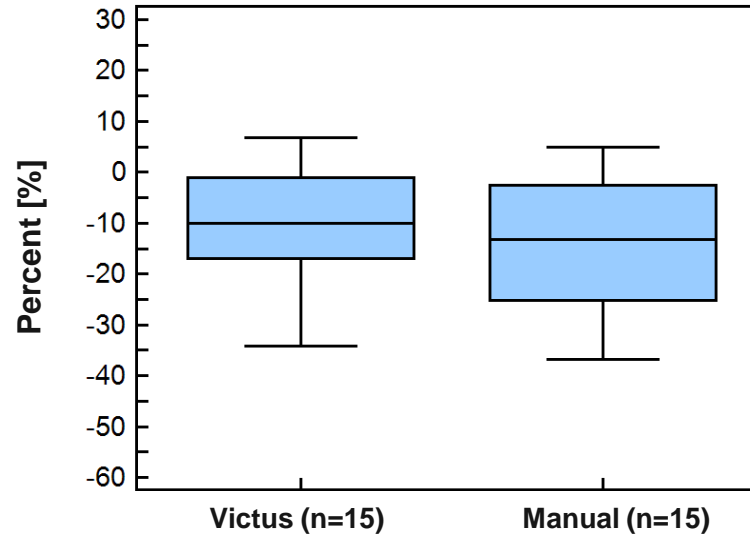


No statistically significant difference between both groups (Wilcoxon Test,  $p > 0.05$ )

## Endothelial cell loss 3 months



## Endothelial cell loss 6 months



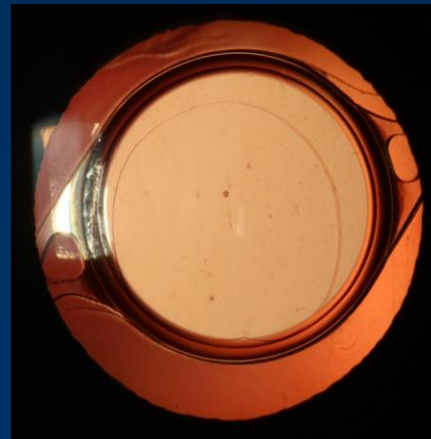
# Conclusion

- Good centration of the capsulotomy
- Precise capsulotomy
- Complicated cases are suitable for LRCS
- LRCS with the VICTUS system is safe and predictable
- Good visual results in both groups
- Statistically significant difference in terms of EPT (shorter EPT in the VICTUS group)
- So far no statistically significant difference in terms of UDVA, CDVA, endothelial cell loss, and APT

Victus



Manual





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