Comparative Analysis of Workflow Efficiency of Laser-assisted Cataract Surgery with Two Femtosecond Lasers

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Disclosures

- B&L, SC
- J&J, SC
- Alcon, SC
- LENSAR, SC
- Zeiss, SC
- RxSight, SC
- Amydis diagnostic, Board Member
- Spinogenix, IC

Introduction

- Robotic laser cataract surgery yields excellent postoperative outcomes, which is attributed to:
  - precisely shaped and well-centered anterior capsulorhexis.
  - better corneal wound construction.
  - lower ultrasound time and energy required for lens fragmentation and liquefaction.
  - less endothelial cell loss compared to conventional phacoemulsification.
- Although advantageous, the incorporation of femtosecond lasers into existing cataract surgery workflow may be challenging.
- Issues such as increased OR time, the requirement of extra space, and the need to move patients from the femto to the phaco, are possible challenges to creating an efficient and cost-effective cataract surgery workflow.

Introduction

- LENSAR ALLY is a femtosecond laser that combines world-class imaging (6 fixed Scheimpflug cameras) and dual-modality pulses in a single laser system.
- The unique features of ALLY femtosecond laser include:
  - 2-4 times faster femto procedure than previous generation femtosecond laser.
  - significantly reduced cataract surgery times.
  - better patient and surgeon experience.

Purpose

- To assess and understand the time efficiencies of two different femtosecond laser workflow scenarios for cataract surgery from the surgeon, staff, and patient perspectives as well as identification of critical changes required to accommodate additional case volume.

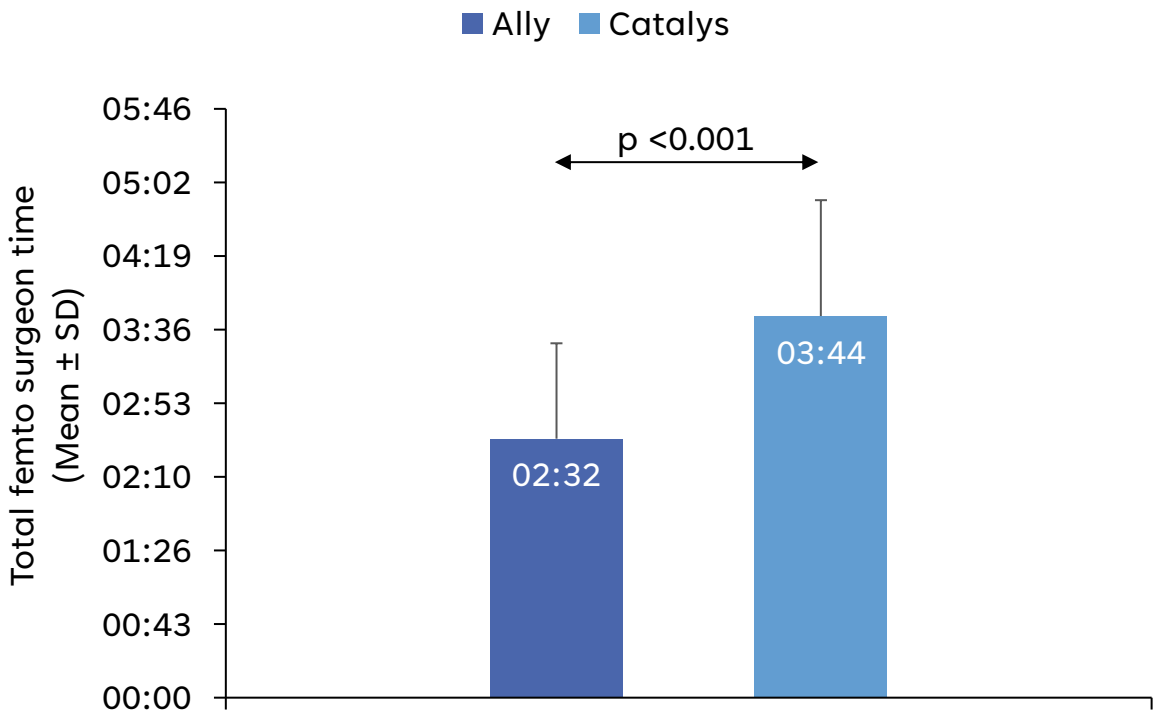
Methods

- Single-site, observational study involving patients with an operable, uncomplicated cataract (grade III or less).

- Patients were enrolled sequentially and randomly to undergo laser cataract surgery using either ALLY dual-modality femtosecond laser (LENSAR) (N = 23) or Catalys (J&J) laser (N = 23).
- Phacoemulsification was performed using the Stellaris phaco system (B&L) in all cases.

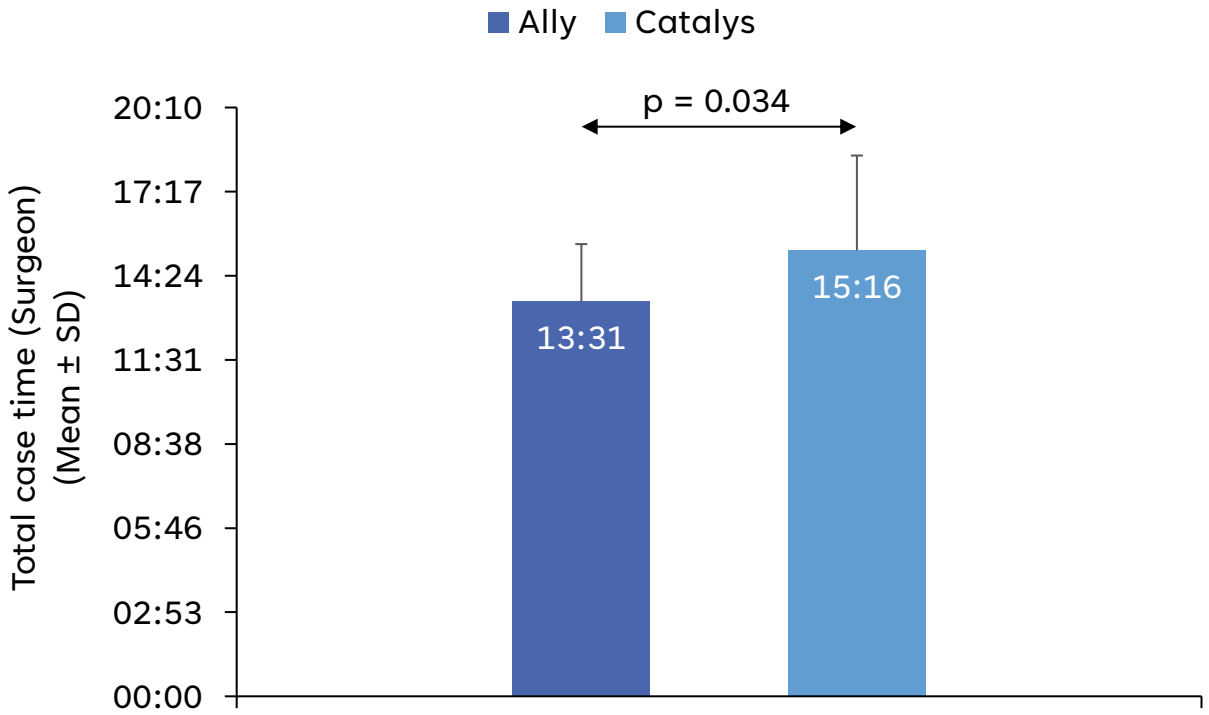
- Procedure parameters: All applicable time intervals for surgeon, staff, and patient, including marking, docking, feeder room (laser) time, femto procedure time, phaco procedure time, total OR time, surgeon total case time, and patient total case time.

Results



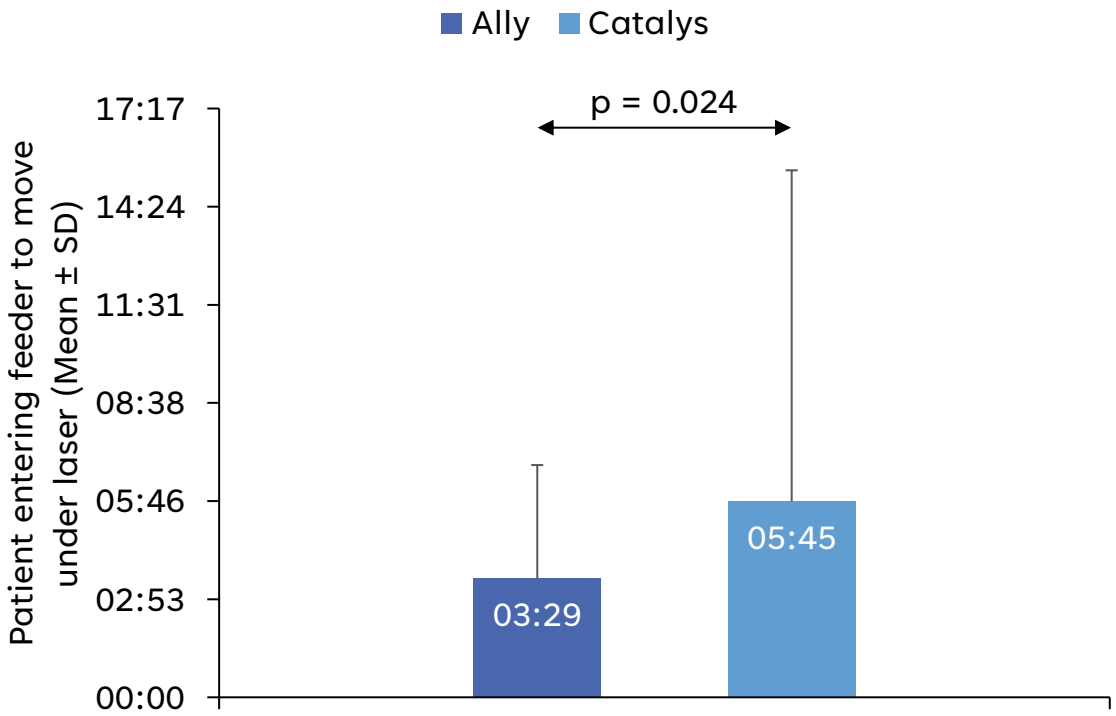
- Total femto surgeon time (time when the surgeon enters the femto room to when the femto procedure ends) was significantly lower in the ALLY group than the Catalys group.

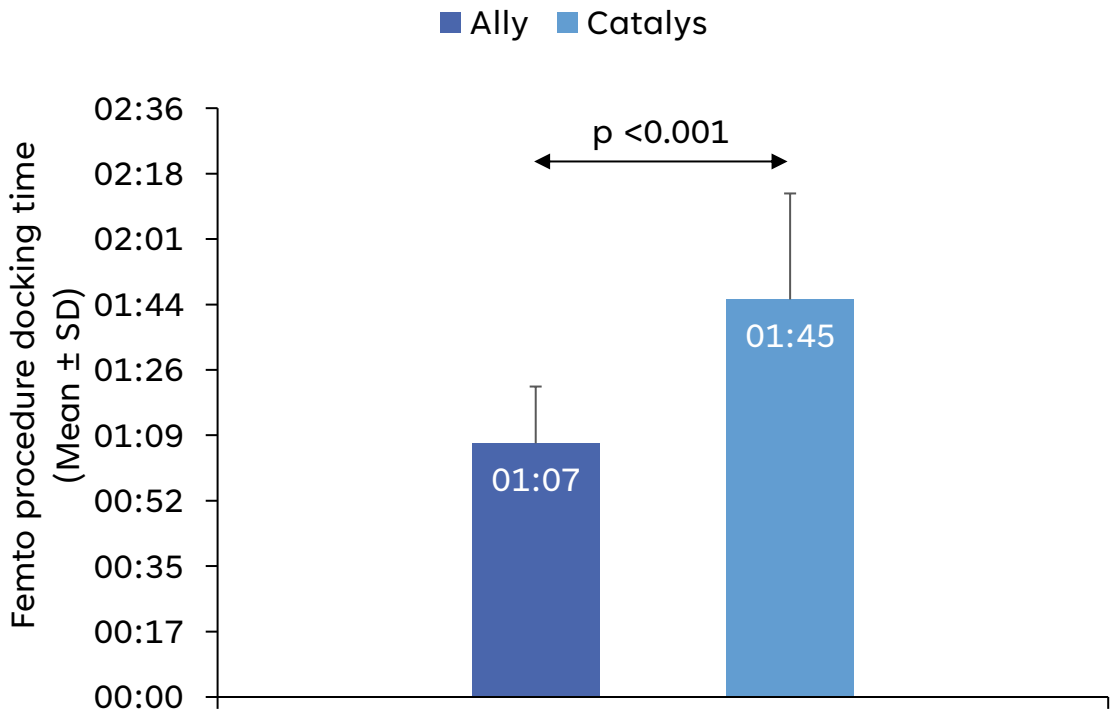
Results



- Surgeon total case time (Feeder In/Out + OR In/Out) was significantly lower in the ALLY group than the Catalys group. The surgeon performing laser cataract surgery with the ALLY laser saved 1 minute and 45 seconds per case.

Results





- The patient “feeder IN to moving under the laser” time was statistically significantly lower in the ALLY group compared to the Catalys group.
- Suction time (femto docking start to docking stop) during femtosecond laser was statistically significantly shorter in the ALLY group compared to the Catalys group.

Discussion

- The use of time-efficient technologies may help improve surgical workflow.
- Laser cataract surgery using the ALLY femtosecond laser resulted in statistically significantly lower mean suction time and total case time compared with surgery performed using the Catalys laser.
  - The surgeon using ALLY laser saved an average 1 minute 14 seconds per case in the femto room and overall saved 01 minute 45 seconds per case.
  - This may translate into more cataract cases in a given timeframe.
    - This study shows that in the time it takes to do 9 cases with Catalys, the surgeon can do 10 cases when using the ALLY laser.

Discussion

- Patients in the ALLY group required statistically significantly lower time to move from feeder room to under the laser than the Catalys group.
  - This is because ALLY patients are already under the system, and the surgeon simply drives down with joystick to touch the PID to the treatment glass.
  - In contrast, patients undergoing with laser cataract surgery with the Catalys laser require positioning of the patient interface and moving the bed from the side of the laser to under the system.
- Patients undergoing laser cataract surgery with the ALLY laser spent less time in the OR than the patients undergoing surgery with Catalys laser.
  - This will likely result in more patient comfort and increased patient flow.