Initial experiences of cataract & lens surgery in 1269 patients in an outpatient clean room using a portable laminar air flow device

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Introduction

In 2020, routine cataract surgery was halted in most countries due to the COVID-19 pandemic in order to reduce transmission.

With a consequent lack of theatre space, we developed a safe cataract pathway in outpatient department clean rooms to minimise patient exposure and time spent in hospital using a sterile laminar airflow device.

The Toul Operio Mobile device (Fig 1) is a portable laminar air-flow device that produces a filtered ultra-clean air flow that can be directed over the surgical site or sterile instruments to maintain sterility.



Figure 1: The Toul Operio Mobile device

Air is cleaned by passing it through a high efficiency particulate air (HEPA) filtration system

We describe our initial experiences undertaking cataract surgery in the UK outpatient setting, outside of the operating theatre environment using this device.

Methods and Materials

This was a prospective consecutive study of our clinical practice.

The Toul Meditech Operio Mobile device, was used to create a sterile surgical site in three separate outpatient clean rooms from May 2020 to December 2021 in different geographical locations within Herefordshire, UK.

Infection control clearance was gained to create clean room in the outpatient department and a one way pathway through the department was made (Fig 2).

Sterility was further aided by minimizing movement in the room, using the minimal number of staff needed and using good door discipline by ensuring that once the surgery had started, the door was not opened.

Observations of the time spent in the department and a formal patient satisfaction survey were carried out for the initial 100 patients two weeks post-op.

All patients were followed up to assess development of post-operative complications

Results

1269 patients were included in the study.

No patients sustained post-operative infection (n=0/1269, 0%).

For the initial 100 patients, the average age was 74.48 (range 39 - 89) with 51% male (n=51). A range of patients with varying surgical difficulty was included (Table 1).

Average time spent within the department was 74.3 minutes for unilateral cases and 93.1 minutes for bilateral cases falling within recommended RCOphth guidelines (Table 2).

Likert–scale used for patient satisfaction showed that most patients were very satisfied with the cataract service (average 9.54 (range 4 - 10)). All patients felt the service ran efficiently and appreciated the experience of being the only patient in the department at the time.

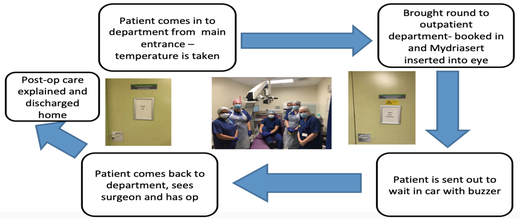


Figure 2: Cataract surgery pathway developed as per RCOphth guidelines to minimise the total time patients spend in the hospital, reduce contact with staff and eliminate the use of a waiting area.Mobile paging devices allowed patients to leave the department after insertion of a mydriatic device. This was a one-way pathway through the department using two outpatient clinic rooms (pre-op review and post-op care) and a clean room.

Co-morbidity	Number of patients
Diabetic	22% (n=22)
Glaucoma	10% (n=10)
Dense cataract	10% (n=10)
High myope	5% (n=5)
Small pupil	5% (n=5)
AMD	4% (n=4)
Only eye	3% (n=3)
Prev vitrectomy	3% (n=3)
Corneal dystrophy	2% (n=2)
Previous Uveitis	1% (n=1)
PXF	1% (n=1)

Table 1: Comorbidities of initial 100 patients

	Unilateral cataract Average time in min	Range	Bilateral cataracts Average time in min	Range
Time taken to book in and insert Mydriasert	9.2	5- 15	8.5	5- 15
Time for consent, surgery and post-op care	65.1	40 -100	84.7	60-120
Total average time in department	74.3		93.1	

Table 2 : Time spent in the department in minutes of unilateral and bilateral cataracts broken down into the initial booking-in time, examining the patient, performing the operation and explaining the post-operative drops and care.

Conclusions

This is the first study to investigate the use of this laminar air flow device in cataract surgery.

Initial results demonstrate a safe, efficient and effective cataract surgery pathway with high patient satisfaction by converting outpatient clean rooms into ophthalmic operating theatres using the Toul Meditech Operio Mobile.

References

The Royal College of Ophthalmologists. *Guidance on the Resumption of Cataract Services during COVID*.; 2020.

Osher RH, Figueiredo GB, Schneider JG, Krehoim J. Purifying air over the operating field with a new mobile laminar airflow device to reduce the possibility of airborne contamination. *J Cataract Refract Surg*. Published online 2021. doi:10.1097/j.jcrs.0000000000000813

Lapid-Gortzak R, Traversari R, van der Linden JW, Lesnik Oberstein SY, Lapid O, Schlingemann RO. Mobile ultra-clean unidirectional airflow screen reduces air contamination in a simulated setting for intra-vitreal injection. *Int Ophthalmol*. Published online 2017. doi:10.1007/s10792-016-0236-1

McHugh SM, Hill ADK, Humphreys H. Laminar airflow and the prevention of surgical site infection. More harm than good? *Surgeon*. Published online 2015. doi:10.1016/j.surge.2014.10.003

Toul Meditech. The use of the air zone unit Operio and the instrument table SterilStay over critical zone and instruments to reduce air-borne contamination at hernia and colon cancer surgery. Published online 2015.