Talking Optics podcast: The changing face of glaucoma management – interview with Professor Gus Gazzard and Moorfield Private Eye Hospital patients

Ron's ectropion had made his eyelids painful and swollen. People kept asking him questions about his eyes and socializing became difficult for him. Ron researched his options but found that few hospitals could treat his condition. He'd previously been to Moorfields for his cataract surgery, so he returned for his ectropion treatment. Ron said his treatment and aftercare were excellent from start to finish. Now his vision is clearer and his eyes are no longer sore. Ron says, "Moorfields private has treated me brilliantly. You're their patient and all their efforts are going into you. You got eye trouble? This is the place to come". Find out more at www.Moorfields.nhs.uk/private.

Hello and welcome to another episode of Talking Optics. The podcast brought to you by Optician Magazine. I'm Andrew McCarthy McLean, a magazines content editor and this episode features Professor Gus Gazzard, consultant ophthalmologist and surgeon at Moorfield's Private Eye Hospital. We hope you enjoy the episode and please don't forget to like, share and subscribe.

Andrew: Professor Gus Gazzard, how are you? Good morning. Thanks very much for the opportunity to speak to us. Thank you for joining us on Talking Optics. We'll be discussing the changing face of Glaucoma management. Now you're a consultant ophthalmic surgeon at Moorfield's Private Eye Hospital, which is the private division of Moorfield's eye hospital NHS Foundation Trust. Moorfields is a world renowned hospital for a wide range of eye conditions.

Gus, how will patients first encounter you on their journey?

Gus: I've got a range of different roles at Moorfields. I'm both director of surgery for the Moorfield's NHS Trust and I'm a professor of ophthalmology specializing in glaucoma at University College London, UCL and then I'm one of the senior glaucoma and cataract specialists in Moorfields private. So I see people in Moorfields private when they first come for an opinion either from their optometrist or from another ophthalmologist seeking a second opinion. And then also I have my busy complex NHS clinic as well.

So often I'll have tertiary referrals sometimes from overseas from glaucoma specialists across the globe. And sometimes I see people from local optometric practices just being sent in for something relatively straightforward, but obviously an important thing for them, such as cataract.

Andrew: One of your areas of expertise is glaucoma. How would you say management of glaucoma is currently changing?

Gus: One of the big shifts in glaucoma of the last five years and I think increasingly so over the next five years is that we're moving away from using medications such as eye drops and moving into using mild, gentle outpatient laser treatment as a primary therapy, but also earlier surgical intervention. So what we're doing is really seeing that if we do laser as the first treatment we can often keep people away from eye drops for many years, five, six, ten years depending. And then at the other end where people were on multiple drops for many years we're realizing that that's not necessarily in their best interests. It's not best for the eye, it's not good for the nerve. And so what we try and do is have a lower threshold for a surgical intervention because those surgical procedures have got much safer. So that's both minimally invasive glaucoma surgeries which we're combining with cataract extraction, but

also that some of the more interventional glaucoma surgeries such as trabeculectomy are now being replaced by procedures with quicker recovery and a shorter turnaround time for the patient such as a Preserflo Microshunt. Really the big shift is away from ‘drops, more drops, yet more drops’ for the patient with all the attendant, inconvenience, costs, side effects, the need to remember to take multiple medications at multiple times of day often with a lot of ocular irritation and discomfort and sometimes systemic side effects as well. I mean these medications really do affect the general body and the general health in many patients. We're moving away from that intensive medicated approach to a more laser-based and surgical approach. So some people are talking about the interventional glaucoma mindset which is intervening earlier to avoid the complications, side effects and potential long-term damage of medications. I'm thinking of it from both ends, both laser first to replace medications at the beginning of that journey but also surgery earlier to try and keep away from medications in the middle part of that journey.

Andrew: What are the key areas being focusing on the moment?

Gus: So right the way across the board of treatments there's a lot of exciting developments in glaucoma. I mean I personally published on primary laser treatment as the treatment of choice a few years ago and that led to NICE guidance changing so that we now mandate that everyone should be offered selective laser-trabeculoplasty, SLT, as an outpatient clinic-based treatment as the first choice. But we're also now refining those treatments and working out how best to carry them out and also using different forms of trabeculoplasty such as direct laser trabeculoplasty that doesn't require a laser and can be done by optometrists in our clinics here at Moorfields as well as the traditional forms of laser treatment and refining how we deliver those using higher power or lower power using them every year or just as and when required and really addressing those questions at the beginning of the journey. There are new medications that have come online. Natarsudil, a Rho kinase inhibitor, is now really beginning to percolate out into general usage and I think again it will change things dramatically over the next year or two.

And then the really exciting developments are in the minimally invasive glaucoma surgery sphere and now internal laser treatments such as the ELIOS excimer laser which can make small openings in the trabecular meshwork at the time of cataract surgery without the need for an implant and then really exciting ab-externo excimer laser such as the VIALASE flight procedure that is able to actually cut an opening in the trabecular meshwork - so encourage drainage of aqueous humour by passing the blockage of trabecular meshwork TM by passing that blockage but does that from the outside of the eye without ever opening the eye. So it's effectively surgery without needing surgery.

It's surgery outside of the operating theatre so that's a very exciting development. In the longer term for the very advanced severe cases, Moorfields has been at the forefront of developing new medical treatments that aren't yet in humans but we hope to be soon - where we can provide growth factors, neurotrophic growth factors that really help keep damaged or dying cells alive and different ways of delivering those to the eye. I mean that's really something for the next five or ten years rather than a year or two but that's very exciting because that's going to treat some of the patients who are most desperate, most in need because they've lost most of their sight already.

There are other developments which we're working on at the moment. Most of the pressure lowering treatments we've had over the years have been drops, laser, surgery, all look at eye ball pressure. What we haven't had in glaucoma are non-pressure therapies. So now there's a lot of interest in vitamin type supplements or oral tablets or drugs which can supplement that pressure lowering approach and keep the retinal ganglion cells, the individual nerve cells, alive for longer

and we have a big study, one of several around the world but we have a big study funded by the NIR, run between Moorfields and UCL. That's looking at B3 nicotinamide which is an oral supplement at very high dose that seems very promising indeed for really keeping those cells alive and has an additional effect we think on top of pressure lowering so that's a totally different approach to trying to keep these cells alive trying to keep people seen.
So I think there's a lot of exciting new developments in the sphere of glaucoma right the way through across the whole breadth of the severity, disease severity and the whole of some patient journey.

Andrew: You've now had a lot of exciting developments occurring in the field which would you say holds the most promise for patient outcomes?

Gus: From my perspective I think one that's probably going to make the biggest impact of the most number of patients is this shift in the mindset from using drops to laser and then early interventional surgery so laser for everyone will keep probably 60 to 70 % of people off eye drops for at least six if not more years and that was from the trial that we published in the Lancet initially and then in the ophthalmology journals.

So that's a lot of people who would have needed medications and daily drops who didn't need them because they got laser and I think that's really really exciting because that's not just a big impact on the few people with severe disease that's a big impact on everyone who gets any diagnosis of high pressure.

So in terms of the greatest number of people changed or influenced or touched by these developments I think that's probably one the one with the biggest impact. I think that the NAMING study, that I'm helping to run at Moorfields, I think that's also got the potential for being a really high impact development because if we can keep these individual nerves alive by mechanisms other than pressure lowering it's going to be again something that applies to almost everyone with high pressure disease with glaucoma.

So in terms of big impacts anything that touches the lives of the largest, greatest number of people I think has got to be the thing that's most exciting and that's why I've devoted a lot of my time and energy to the laser treatment of glaucoma and then also a lot of time to the NAMING trial of nicotinamide B3. Some of the other developments, minimally invasive glaucoma surgery, running trials of minimally invasive glaucoma surgery aimed at reducing the dependence on eye drops, reducing the need hopefully for further surgery also have big impacts and are really exciting but this is a smaller group of people because they really only apply to those patients who have a cataract or need cataract surgery for other reasons - it's a large number of people but again a subset of the total.

Andrew: You mentioned there about your involvement in the laser and glaucoma and ocular hypertension trial or the Light trial. What was the initial purpose of the study?

Gus: We set up the Light trial over 10 years ago now because we knew that selective laser trabeculoplasty - where you apply visible wavelength of light in very short pulses to the trabecular mesh work in the front of the eye through a contact lens – a gonioscopy lens - we knew that that could lower pressure we knew that it does lower pressure so we knew that you *could* use it but what we didn't really know was whether we *should* use it so I want to answer this question okay fine we can do it but should we? That was the goal that we set ourselves. We were lucky enough to be funded by the NHR, a health technology assessments wing of the NHS research body and we recruited 718 patients into the trial and randomized them to either drop first or laser first and the reason for doing that was we had a hunch that we'd be able to keep some people away from medication for a little while.

We had no idea that would be as effective or as good as it turned out to be and of course we are very excited that at the end of three years over three quarters of patients had eyes not needing eye drops at that time and by the time we got to six years 70 percent of patients were still controlled with really good disease control good pressure control without the need for medication

Andrew: And what were the key findings from the trial?

Gus: Well the key finding was one that I mentioned which was the proportion of patients with disease control without medication so probably looking at the 70 percent of patients controlled without eye drops at six years that's probably the really big headline result because prior to that nobody realized that laser could work as well for so long but some of the secondary effects the consequences of that disease control are really exciting so we also saw that in the group that started off with laser rather than eye drops in that group there were fewer patients that needed glaucoma surgery so we had less glaucoma surgery in the laser first group than we did in the eye drops group and that carried on right way out to six years when we finished the follow up we also saw that what patients care about which is how well is their vision protected, we also saw that their visual field tests of their peripheral vision with Humphrey white on white 24-2 perimetry that was better preserved in the laser first group than in the drops group.

That's really exciting because we preset target pressures for each individual eye based on severity and starting pressure we then aim to hit those targets with whatever means required and we found that even though the two groups got treated to roughly the same pressure with different amounts of ancillary treatment even though they were treated to the same average level of pressure, the laser first group did better so laser mechanism of pressure lowering seemed to be more effective at preserving vision than was the medication method of pressure lowering so that's been a really exciting headline finding it means that drop or medication independent pressure lowering is probably better than medication dependent pressure lowering.

So in short, lowering intraocular pressure with laser or indeed with surgery, as was shown from the HORIZON trial when my team analysed the horizon trial visual fields looking at minimally invasive glaucoma surgery and the impact on visual fields -what we find is that laser or surgical pressure lowering is better able to protect your visual field and thereby protect retinal ganglion cells from death better than medication and that's really exciting.

Andrew: What do patients say when you present with the idea of laser surgery when they were perhaps anticipating eye drops as a treatment option?

Gus: I think a lot of people are disappointed by the idea of needing to put in drugs every day, a lot of people these days from more aware of side effects and also they find the actual act of having to instil medication, as drops, in their eye difficult or unpleasant and it reminds them every day that they've got a problem even if they weren't aware of it before, so psychologically it's more difficult.

So a lot of people are very welcoming of the idea that a one or sometimes two treatments in clinic are able to hold off the day when they need that medication - it's not inevitable and not everybody is controlled forever with laser and I have to be very open with my patients about that.
Some patients are scared of the word laser - they've seen James Bond you know they see Sean Connery get almost chopped in half by a laser and they think that these things are big scary burning things that are going to somehow cause pain when I'm reassuring them that this is actually just a way of you know very intense focused light at the front of the eye, that it's done in clinic and I tend to do a laser or two or three in most of my clinics and I can often say to patients well look don't worry you were sitting next to somebody who you didn't realize it but you were sitting next to

somebody who had a laser done half an hour ago. You know it's not a big deal you'll be able to go home the same day, it only takes about 10 minutes to do, you're sitting around in clinic for an hour or so waiting for a checkup but it's not scary, it's not painful, it's not dangerous so when presented correctly patients are very accepting of the idea and they like the idea that it's the way the laser utilizes some of the body's natural healing and defense mechanisms to really try and rejuvenate the trabecula mesh work rather than medicating it and causing potential additional harm at a later date. And there is some evidence that medications and preservatives particularly will do that whereas the laser seems to be able to divert some of the damaging age-related changes in the trabecula mesh work that caused the increased pressure and almost sort of reboot that TM because it causes the stem cells to divide and probably migrate into the trabecula mesh work and repopulate the areas that had lost their cells so it's a very although it sounds very interventional it's actually a very natural method relying on the body's own white blood cells monocyte macrophage and population and stem cells to really reinvigorate the trabecular mesh work to be able to do what it was meant to be doing which is draining off fluid from the anterior chamber.

The LiGHT study led to NICE issuing new guidelines for the treatment of patients with glaucoma in England and SLT is now the primary treatment option to lower intraocular pressure because this trial is still ongoing. We finished with follow-up after six years and that's when the funding stream for the follow-up ran out (the NIHR tends not to fund very long ongoing trials) but we're very much still investigating the results from the study. We have now published what happens after if you have repeat laser we show that to work very well and in fact the second laser is often worked for longer than the first one did.

We also show what happens if you take eye drops for three years and then switch over and have laser treatment after and we were able to show that laser treatment after medication can work extremely well so that was an interesting and novel finding.

We've also looked in detail as I mentioned before about the visual field analysis and the protection of visual field so all of those analyses and papers have been published in the last year or two but we're continuing to work on the relationship between visual field loss and intraocular pressure control and types of pressure control.

We're looking at predictors of success and we're even moving on to looking at the interactions between certain genetic make-ups and how some people respond to laser and some people respond less well. So we're looking at the genetics of laser response and the genetics of response to medication and so a lot more analysis from this really rich rewarding data set that we've managed to collate over the last decade a lot more analysis coming out of that as we speak and a lot more to come I hope.

Andrew: What new treatments are in the pipeline?

Gus: I think probably the most exciting new treatments that are just in the offing about to arrive are some that are already widely available but not widely taken up such as excimer laser trabeculostomy. Making openings in the trabecular meshwork at the time of cataract surgery with a laser probe and excimer laser probe such as has been used for refractive laser surgery but on the cornea but repurposing that to use inside the eye on trabecular meshwork . The VIALASE laser, which is a femtosecond laser so a very different wavelength, very different pulse duration is able to pass through tissues so it passes through the cornea and then makes a hole in trabecular meshwork through to Schlemm's canal. So that's very exciting. Those are really I think cutting edge technologies that are already here even if yet not quite available.

Vitamin B3 nicotinamide is being widely investigated in six big trials around the world. New York,

Singapore, Sweden, ourselves at UCL and other sites, Hong Kong as well as well as Australia, all looking at this potential treatment to try and work out who benefits most what sort of dose we should use but there are other oral treatments which are beginning now to have increasing support for preservation of retinal ganglion cells in glaucoma and then I think in the more distant future I think regrowing individual nerve cell axons is quite a long way away. Maybe it'll happen in my lifetime I don't think regrowing nerves is going to happen in my working lifetime but that's something that's there in the distant future.

A little bit closer than that though is the ability to deliver neurotrophic growth factors such as brain derived neurotrophic growth factor and others deliver those to the inside of the eye from living cells that are packaged up inserted into the back of the eye in a safe fashion and they can sit there living happily secreting these growth factors and they may be able to keep retinal ganglion cells alive for longer in otherwise sick eyes where there'd be a problem. So a whole series of exciting treatments some of which are here now and need more investigation and need more research some of which are just within our grasp and some which are a little bit further away.

Andrew: Gus, going forward how significant are all do you envision optometrists in primary care having a role in glaucoma management?

I think one of the big exciting changes about how we actually deal with patients in glaucoma has been since just before COVID we have realized that we have too many patients and too few ophthalmologists. Ophthalmologists take a long time to train they're expensive and they have a limited amount of capacity to see people face to face so two big changes have happened there. One is being realizing that low risk patients don't necessarily need to see somebody in person they can have their tests done and if those tests are stable we can write to them and say look you're absolutely stable don't worry about it a bit like going into the GP and having a blood pressure check and then the GP looks at the results and lets you know that they're happy without necessarily needing to sit face to face in front of the doctor but also the really you know big exciting shift has been the hugely increased involvement in face-to-face eye care from our optometrist colleagues both in hospital and in primary care now depending which area you're in there are big changes in developments over the last decade in Scotland with a really really strong impetus for training of community-based optometrists to take over some of the care because of the geography.

In areas that are more urban there's much more emphasis on those optometrists coming in working in the hospital clinic because it's less part of the patients of the travel and we now have 100 optometrists working in our glaucomic clinics making complex high level clinical decisions for our patients in face-to-face clinics as well as remote clinics and then in other parts of England and I think down south and south London there's a really good link up of community based community cited optometrists collecting data seeing patients making clinical decisions and then communicating that data and communicating those decisions to the local hospital.

So there's a sort of a shared care model between those two branches of eye care so I think there's a realization that you know neither of us can do it alone and with collaboration and cooperation we're going to be able to do so much more but there's also I think a very strong message there that one size does not fit all. We should not be doing just shared care in the community or should not be doing just hospital based optometrist services and it very much depends on the individual environment so huge developments huge moves towards a broader number of clinic clinicians treating patients.

There's another component of that which is that we now have optometrists delivering laser therapies for glaucoma laser treatments such as selective laser trabeculoplasty in Moorfields a lot and also Moorfields and University College London UCL have set up training courses for optometrists and

nurses to deliver SLT laser, courses for optometrists across the whole country so people have come to us and been trained and are very successfully, safely delivering SLT to patients across the country so that's another really big exciting shift

Andrew: How is co-management of glaucoma with primary eye care professionals progressing?

I think optometrists in primary care rather than optometrists in the hospital eye service are obviously going to be absolutely vital for us - what we need to get right is the transfer of community and communication of data between the two systems. I know that in Cardiff they've got a great system where they can use the same IT platform called OpenEyes to load up data, clinical findings and decisions about a particular patient that is then perfectly accessible from the hospital eye service and the hospital clinic and they can have an oversight of what's going on but also truly shared care and true shared data collection and that's been the big hurdle for us trying to sort that out in London is that we haven't always had the information governance compliant secure conduits through which this these data can be shared in a way that doesn't lose information.

It's all very well having a visual field but if you have a nerve OCT scan then you really want to have the raw data such as the DICOM files transferred because otherwise you're just looking at a really cut down subset of the data so I think with the technological developments that have come online in the last five years there's going to be a hugely increasing role for a community optometrist and we have to get that right - that's going to be beholden on both of the hospital eye service and the community optometrist to really work out what sort of role the particular individuals want to take on and how we do that and how we do that safely.

But I think it's going to be essential and certainly we've seen some very successful examples of that already happening in Cardiff, in south London, in Scotland and many other areas around the country where often individuals have led their local service and I think that's going to be the way forward for the next 10 years.

Andrew: Gus thank you very much for joining us and talking optics hopefully you can join us again soon.

I'm now joined by Anne who is a patient of Moorfield's and thank you for coming on Talking Optics when we first diagnosed with glaucoma.

I think it was 2012 at a routine eye check with my optician I had to do with one of his field tests and he found that my pressures were up and said that he thought I might have glaucoma and that I ought to go to Moorfields he wanted to refer me to Moorfields and I was actually a bit shocked. I wasn't that familiar with what glaucoma was really and it didn't sound too brilliant but in the end he did do another test. I think probably the next time I went and he decided that I definitely did need to go because they were up in the 20s.

You said you were quite shocked did you know anything about glaucoma?

No. I'd heard of it but there was no family history or anything and I didn't know anyone with glaucoma and in fact I think I've only probably met one person since in all these years who's got it but I keep telling people please please go to your optician and see that your pressures are all right.

How does it affect you day to day? Well it's a bit of a nuisance taking drops twice a day I have to take two drops one in each eye every morning and two drops also a little bit later in the morning with a five-minute interval. I have to attend outpatients to check that I'm okay my levels are pretty

good now thanks to Moorfields

It the only thing that I can think of that it actually would make me know that I had something and this is very typical of people with glaucoma is that if I go from a light room into the dark for a few moments a few minutes perhaps I can't see but that comes back and that's apparently typical and that's the only way it intrudes in my life apart from having to go to appointments that are outpatients now.

Andrew: When you were first told about potentially having glaucoma were you then referred to Moorfields?

Yes I went to Moorfields and I was almost immediately as far as I remember asked if I would join the light trial which they were doing into glaucoma and Professor Gazzard was leading and I thought yes please because you always know when joining a research trial you're always treated really well and I was. I mean it was amazing it was like being a private patient they gave me such a lot of attention and I was patient 13 so I was quite near the beginning of the trial and it was very very thorough every time I went.

I had the dreaded field test which I don't enjoy and I'm very bad at and the ordinary eye tests and the vision tests and very very amazingly well looked after there by Professor Gazzard and Neil and they took very very good care and apparently I was quite an interesting patient which was to my advantage because it took them quite a long time to actually really find what was going to work with me so I had quite a few procedures I was a bit anxious at that point about having an operation but it but it was absolutely fine and since then I had quite a few different treatments and quite a lot of different drops that I had to take and I also had laser treatment and they were kind of searching around trying to find out what would be actually the best treatment and I think eventually we have hit on exactly the right one.

Andrew: Presumably that was quite a stressful time how did you feel?

I have to say I felt completely confident I felt that I was in really good hands and I completely trusted both Neil and Professor Gazzard they were really attentive most of the time I was looked after in the light trial and then I also had at the end of the light trial towards the end I also had cataract operations so I have no fear about having any procedures on my eyes I was just very very lucky that they were so attentive and so skilled and I've often said I wouldn't let anyone else touch my eyes but that's because they did such a really really good job what was required of you during the trial well it was to attend appointments from time to time at fairly regular intervals just required to go through all the procedures and while they searched really for what would be the best treatment for me and that did take quite a bit of time but during all of this my sight was not affected and I only have partial damage in my left eye which is that the eye that is causing most of the problem and my right eye is very good at actually adapting so that I wouldn't notice unless I put my hand in front of my right eye that's the only time that I would actually notice that there was a problem so I think it was in retrospect it was the care and attention that I received in the trial and I also I suppose I felt that I was contributing to the research which was important.

I think the main message is that I'm I'm pretty stable now and it was thanks to being spotted by my optician and then the treatment that I had at Moorfield I'm just so grateful for my optician for spotting it and also for Moorfield for actually sorting me out and being on the like trial was an absolute privilege when I was offered it I didn't hesitate.

Andrew: Thank you for sharing your story with us and talking optics and thank you listeners for joining us once again don't forget to like share and subscribe