LASER SURGERY - MY EXPERIENCE ON ASTRONOMICAL OBSERVING

Deteriorating Eyesight.

After enjoying over 40 years of observing, I love nothing more than peering down the telescope looking at faint objects and trying to see the tiniest detail on planets or the Moon. As the years have passed I have found that my observing has suffered due to inadequacies in my Mark I eyeballs. I have suffered from astigmatism for many years which has given me many issues over time. This has been extremely noticeable at the telescope and using a camera, as adjusting the focus on either of these cannot cure my prescription. This meant that I always needed to wear my glasses when observing or taking photographs. This often resulted in holding my head at funny angles to try and reduce the reflections on my glasses that always seemed to interfere. I had considered laser surgery a few years ago, but considering the extreme nature of the treatment, I always considered it far too radical as my eyesight was far too precious to be tampered with. I tried contact lenses about 10 years ago, but my eyes seemed to resent having anything plonked in them and soon became very sore. As I approach middle age, another problem has now reared its ugly head. Presbyopia! This is caused by age stiffening up the lens so it cannot accommodate close vision so easily. This means I now needed two pairs of glasses, one for everyday use and another for reading and on the computer, greatly adding to the inconvenience. I put up with swapping between two sets of glasses for four years but it was, to put it mildly, extremely frustrating. I did try vari-focals for a short time, which were a vast improvement day to day, but it always seemed that what I wanted to look at was frequently in the wrong part of the lens and often had to move my head into such awkward angles to see through the part of the lens that enabled me to see what I was looking at clearly. DIY was a nightmare when doing close-up work. Plus there were still those awful reflections and positioning of the head to put up with while observing as well.

Growing Frustration and Investigations.

With growing frustration, my mind turned to investigating having laser surgery again. I did a lot of research on the Internet, and, as you can imagine, found very many horror stories. The thought of anything going wrong (and it can) was quite off-putting. This is really what has prevented me from seriously considering having it done previously. Added to this, a work colleague had it done about three years previously. This resulted in awful eye infections and other on-going problems, which the last I heard were still trying to be resolved.

In the end, the frustration of observing was just too much. I really did need to do something drastic to try and enjoy my observing again. I searched around the Internet to see what benefits as an observer I could expect from having such a procedure? There isn't that much previously published, but I did find two short articles. One published in Sky & Telescope in August 2003 and another in Astronomy Magazine in November 2007. Their conclusions were just as I expected. Some people have fantastic improvement in night time seeing, others end up with permanent flares and spikes around stars after the surgery. So it did seem a real mixed bag. But since publication of those articles, laser surgery technique has been further developed and much improved, with many more patients having gone through the procedure. So after much consideration I decided to have the tests done to see if my prescription and eyes were suitable. After having all the tests, surprise, surprise, I was a suitable candidate. So now came a very difficult decision. After much deliberation and soul-searching, making that decision to have the surgery was probably one of the hardest I have made. Knowing how important I regard my eyesight, and how much I love my hobby, did I really want someone messing about with my eyes? What if it did go wrong? But, despite all my reservations, I did make that decision, paid my deposit and booked my treatment.

Available Treatments.

As I understand it, there are a number of different procedures you can have.
The main treatments on offer are:
LAZEK - An alcohol solution is used to separate the epithelial layer from the cornea. The surgeon uses a blade to cut a flap. The laser reshapes the cornea and the epithelial layer is replaced.

LAZIK - The surface epithelium of the cornea is removed. This can either be done by blade or by laser. The laser procedure is more expensive and has a shorter healing time. This is more expensive than LAZEK procedure, but has quicker healing.
There is also an option of having Wavefront Technology with both procedures. This takes into account small imperfections in the focus achieved by your eyes. By mapping these in much greater detail a much higher accuracy laser correction is applied to the shaping across the cornea. This option of course comes at a premium.

The amount of correction that can be achieved is dictated by two things: Your prescription and the thickness and condition of your cornea. A stronger correction will result in the laser removing more of your cornea, so will require a thicker cornea to work on. This will also be more expensive. You often see adverts advertising cheap laser from a few hundred pounds per eye, then this price is based on them carrying out the minimal correction. At that cost your eyesight probably has minimal problems, so the benefit from having the surgery would be minimal. You can bet your life that if your prescription is particularly strong, it will cost much more than that advertised price.

Quite important for night vision, I was really pleased to find out that they measure the diameter of your dilated pupil in the dark. They then make sure that they treat right across that diameter of your cornea to maximise your sight correction at night. Had they not done this, there would have been distortions in the vision when the iris was at its widest and the untreated cornea exposed to the incoming light path.

The Surgery Itself.
As the date of the procedure approached I was extremely anxious. In fact I didn't like talking about it at all. So much so, that most of my work colleagues didn't even know I was going to have it done until the day before. I opted for LAZIK (laser flap construction) treatment with Wavefront technology. Although much more expensive, it should give me the highest probability of achieving a very good outcome. This was particularly important for my observing and photography. Why would you scrimp on something as important as your eyesight? I wanted to ensure that I didn't regret my decision.

Arriving on the Friday morning, I had a few more preliminary tests and measurements then had a quick discussion with the surgeon. All was now set for the procedure itself, something I really wasn't looking forward to. They lay you down on a swivelling couch between two large pieces of equipment. An eye shield with some small holes in it is placed on one eye. Anaesthetic drops are put into the other eye to be treated. A clamp is then placed onto your numb eyeball and seconds later you are swung under the laser and told to look at a light with your other eye. A few seconds later you hear the machine counting down to zero and the light goes off. The laser has now separated the epithelial layer from the cornea and created the flap. You are then quickly swung round to the other side where the flap is lifted off the cornea and moved to one side. (One side of the flap is always left attached to the cornea). At this stage you feel quite a bit of pressure on the eyeball and the vision in the eye being treated goes completely black. This would have been a bit disconcerting had I not been informed of this beforehand. Very quickly you are swung back under the laser where you are told to look at a light with your other open eye. The laser takes a few seconds to reshape the cornea and the bulk of the procedure is over after another countdown. Yes, there was something that smelt like burning while this was being done! Whether it was my cornea or not, I don't know. You are then swung away from the equipment. The clamp is removed and the epithelial flap is carefully replaced back over the cornea by the surgeon. Blurred vision returns to the treated eye before this point. This procedure is then repeated with the other eye. The whole process taking less that 5 minutes.

After the treatment I was then taken into a small sitting area with a nurse and given a very welcome hot cup of tea. I found myself physically shaking due to the adrenaline that had been pumping around since I arrived which peaked massively due to anxiety during the surgery. From coming into the surgery and being able to leave took just over 20 minutes. Straight after the procedure the eyes are still numb, so there is no sensation of pain or discomfort at all. I was amazed to see that already everything was in reasonable focus, but with a hazy fog in front of everything. I was amazed that I could see quite a bit

of detail in distant objects and I could read number plates very easily as my wife drove me home. About half an hour after the procedure, the effect of the anaesthetic drops started to wear off. It wasn't particularly painful, but felt a little bit like having grit in the eyes. When I got home I did as advised and went to bed to try and sleep for most of the afternoon. The gritty feeling was still present that evening but I was able to watch some television easily. That feeling had subdued quite a bit by the time I went to bed for the night. I also had to wear some sexy protective goggles whilst sleeping to try and stop me scratching my eyes in the night, causing my wife much hilarity.

The Morning After the Day Before.

When I woke up next morning the day after the operation, both my eyes slightly ached, but the gritty feeling and the fogginess had gone. Going back for an eye test that morning I was assessed how effective the treatment was. I still couldn't drive until I had the eye test, but this confirmed that I had already had a prescription very close to 20:20 vision after less than 24 hours. I regularly applied Anti-inflammatory and antibiotic drops to my eyes regularly and I had to avoid getting water in my eyes for the first week. Returning a week later another eye test showed that my vision was now better then 20:20. I went back to work on the Monday. After the operation my eyesight varied from day to day, but the majority of days are completely blur-free. The healing can take many months to complete before the true prescription was properly known.

Already it seemed to be a great outcome to me for day to day, but how did I find it in practice doing my beloved hobby? Four days after the operation we had a clear night and I nipped out with a pair of binoculars to have a look. The Moon looked slightly blurred round the edges but the stars being fainter looked relatively pin-points of light. For a few weeks after the surgery, bright lights and brighter stars at night started to have long spider web flares around them, so I was a little concerned at this stage. This effect has gradually reduced as healing progressed and is now almost non-existent.

My Conclusions.

So how has the surgery affected my general observing at the scope? Now almost two and a half years since my surgery, I have spent many a session out under the night sky with my new found vision. Views of the Moon and Saturn are the best I have had in many years, possibly since I was a teenager. Lunar features are clear and crisp with small detail popping into view during short periods of steady atmospheric seeing. Saturn's Cassini Division was very clear at the ansae of the rings, despite the angle to Earth still being fairly shallow in early 2012. Star images look extremely sharp and pinpoint and there is no excessive flaring around bright objects. I was also pleased to have easily split the star Porrima using a 10" Dobsonian and a 5mm eyepiece, easily seeing dark space between the slowly widening double star in Virgo. Later I also caught a glimpse of The Pup, the diminutive white dwarf star companion to Sirius. So, for me, the surgery has so far exceeded all my expectations. Using the telescope and camera has become much easier and less frustrating. Views through the telescope are now as good as I have ever had. If I get a good 10 years of good eyesight out of the procedure, I feel it will be money well spent.

Recommendation.

Would I recommend laser surgery to anyone else? On the one hand, I have had such a good experience and outcome, of course I would. But, on the other, I would be loathe to recommend it to anyone else in case they had a bad experience, like my work colleague. One thing I do know is that you should definitely NOT have laser surgery if your prescription is still changing. Don't forget that they cannot fix everything. My astigmatism and short sightedness may now have been cured, but I still have to use reading glasses, as laser surgery cannot cure the lens stiffening problem. But this is something I can definitely put up with considering the huge improvement I have seen in everything else I am now able to see.

Summarising.
In summary, despite my initial reservations before having the treatment, having this operation has definitely enabled me to enjoy visual astronomy much more, rediscovering the visual acuity of my youth.

Yes there can be problems and complications resulting from the procedure, but as time goes by these seem to be a lot less frequent.

My eyes are sometimes feel a little dry, especially just after waking up, but again this feeling has become less regular as my eyes have healed.

If the improvements I have so far seen last me for just 10 years before my eyes change again, then it will definitely be money well spent.

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