0:00 - Start
Interviewer: How long ago did you get cataract? Or when did you first realized it?

Dr. Moran: I first realized it when I was 30. In my family, there is a hereditary cataract. So my sister discovered she had cataract in one eye. Then, she said they (the doctor) recommended that the whole family get tested because it is very rare at this age to get cataract. So I went in to get tested, and the doctor said “Oh yes! You have cataract” And I said “which eye?”, and he said “both”. At the time he said, you’re very young, so they’re not that bad yet. They will deteriorate. You should wait until they are worse because your eyes will never be perfect again afterwards. And I waited 10 years, but I waited too long. Because it was gradual decline, and you don’t realize that it is gradual, and how bad it actually has become for a long time until it is severe. The other reason that I waited is because when you’re young, it is very hard to get insure, to have proof that your eyes have deteriorate to the degree that insurance will pay for your surgery. Whereas if you’re older, and age onset cataract, they do cover it easily.

Interviewer: Is that because of the price of the treatment?

Dr. Moran: Yes, it has to do with the cost. Even though it is not a huge cost, the insurance company don’t want to pay for any treatment you don’t need, so you have to prove that you really need it. I had the surgery done when I was almost 40.

Interviewer: So 10 years after they initially found it?

Dr. Moran: Yes.

Interviewer: What were the complications that arose to your cataract that you noticed?

Dr. Moran: I could hardly see in the sunlight. If I was out all day in the sun, it would be painful. How did that affect me? I was doing a doctor program at the time. When I go to classes, I would take a black whiteboard marker because I couldn’t see the green on the whiteboard.The light from the whiteboard and the green, I couldn’t see the green. I couldn’t see red. I couldn’t see color. I couldn’t see fine lines, and it was very difficult. At the end, it was very difficult to read even with glasses. I had to wear huge magnifying glasses. It was quite severe. It ripened quickly in the end. (End: 4:00)

4-7
Interviewer: I see. So it affected your ability to see in the sunlight and in general?

Dr. Moran: And in general. Initially it was just in the sunlight, but as it deteriorated it was in general.

Interviewer: Did it come on quickly or was it gradual?

Dr. Moran: Gradual process. I didn't notice the decline until it got really serious. I mean I noticed my eyesight was deteriorating, but because it happens gradually, you don't know how bad it actually is until it's very serious

Interviewer: Okay, and so the cause of cataracts for you was probably genetic?

Dr. Moran: Yes.

Interviewer: Alright, so was it just your sister and your family that had cataracts?

Dr. Moran: My brother as well.

Interviewer: And um what process did you have to go through to cure the cataracts?

Dr. Moran: Right. I wrote it down so that I would get it right. This process called Phacoemulsification. Phaco meaning sound. So they make a little tiny incision on the side of your eye and they put a tiny instrument in that uses high frequency ultrasound to break down the centre of the lens and then they just suck up your lens. And then you have a choice if you want to have a silicon lens, a plastic lens, or nequilic lens. And I said "what's the best? What's the longest lasting?" Which is silicon. And I have silicon lens. They inserted in the same hole and it unfolds in your eye.

Interviewer: What was that process like?

Dr. Moran: It's like drips going down on my face. They freeze your eye. They freeze your eyeball. Anything to avoid that really.

Interviewer: How long did that take around about?

Dr. Moran: About an hour? They had to polish off. One eye was quick it was about 40 minutes, the other one was longer because cataract can grow more than just in the lens and they polished it all out. But often it happens that for somebody, and it happened to me, that you can still get a secondary cataract and then they have to do a laser hole in your silicon cataract lens and check it. So it's not 100% certain, but it is pretty effective.

Interviewer: How long does the lens last for?

Dr. Moran: Indefinitely.

Interviewer: Indefinitely? Ok.

Dr. Moran: Which is why I chose silicon. Unless you get the secondary cataracts, then you really have to take some other treatment.

Interviewer: Were learning complications arose or did it go off without a hitch.

Dr. Moran: It went off without a hitch and it was like a miracle.

Interviewer: Awesome.

7-9
Dr. Moran: I came out of the surgery, and I saw colors. The temple of the street; I never knew that was colored.

Interviewer: Oh wow. It only took an hour. That's pretty great.

Dr. Moran: It only took an hour. Over night, you have to be careful because you can't get dust in it, can't get liquid in it, you have to cover it, and you can't rub it. That could dislocate your lense.This condition is for 24 hours.

Interviewer: Is there anything you have to do regularly to maintain your eyes' sense?

Dr. Moran: My difficulty was while they were " ripening" Although I had to choose because when you have fake lense, you have to choose between near sighted and far sighted. You can't have one of each. Therefore, I chose to be far-sighted. I can't read near things.

Interviewer: Near-sighted means you can't see far. Haha this is quite counterintuitive.

Dr. Moran: I can see far things, but I had to choose if I wanted to see far or near. I have to use glasses for reading. But that's a huge disadvantage. I never had glasses.
Interviewer: How did you make that decision? Did you just think about it practically… or..?

Dr. Moran: It was pure random.

Interviewer: Oh, I see.

Dr. Moran: I didn't want to walk around carrying my glasses. Wearing them the whole time, I was thinking// If I'm reading I can wear them, then I'm done. It was easy.

Interviewer: Most of the people eventually have to get reading glasses.

Dr. Moran: That's true, most people do get reading glasses. If the whole time I'm carrying around, I would forget them. Probably.

Interviewer: Okay so um do you take eye drops regularly? This is kinda unrelated, but um,

Dr. Moran: No. Um, unless I'm travelling then I do.

9:06

Interviewer: Now, I'm going to go to more specific questions. Our project has the aim of creating a cheaper and noninvasive cure, so it hopefully shouldn't have to involve incisions….

Dr. Moran: When my sister had her surgery, they had to cut around her eye to take the lens out. And that is still what they do in most country.

Interviewer: Would wearing contact lenses long hours a day or applying eye drops regularly be preferable to your sister's treatment?

Dr. Moran: Absolutely. You never want to undergo eye surgery, unless you really have no alternatives. So if drops or lens of any kind would allow me to have another ten years before the surgery, I would certainly use them.

Interviewer: The thing we need to consider is hereditary cataract vs. uv light exposure….

Dr. Moran: But mine ripened in the sun when I was doing my doctor's program in San Diego. I was out all summer long and that's when my cataract ripened. Cataracts are cataracts. So, the sun will ripen them no matter what causes them initially.

Interviewer: Is there a single factor made you decide to undergo surgery? Or did you just decide to do it because it got really bad?

Dr. Moran: I had no choice. It got to the point that I couldn't read.

11:11

Interviewer: We are choosing between a couple different prototypes. With the eye drops and with the lenses, they would take a long time. So, there's an alternative that we are looking into where we encapsulate the medicine and it would be disperse over a longer period of time. It would be more longer lasting and a single treatment, and what do you think of this as oppose to the eye drops and the contact lenses? Is there a big enough benefit that we should pursue it?

Dr. Moran: I'm more inclined to the eye drops. If it was a treatment of choice, eye drops would be quick, eye drops would be easy, and it is not unusual for people to use eye drops for different reasons. Second would be the lens. I do like more direct application and more regular treatment as a habit like everyday this is what I do like taking vitamins.

12:28

Interviewer: This is specifically one direction that we are going into where it could possibly be a vector that we could deliver the medicine is nanoparticles which will slowly degrade

(biodegradable) with no side effects. That would be a long term solution. It would degrade a longer period of time with treatment.

Dr. Moran: How would you apply in those?

Interviewer: Through eye drops...

Dr. Moran: Great! Excellent!

Interviewer: Yeah! So, would you be comfortable using nanoparticles in your eye?

Dr. Moran: Yes! I would really be comfortable using any alternative to surgery because there's just this certain indecisive/unguaranteed element to surgery. When you can avoid surgery, one tends to avoid it. Eye Drops - it's easy.

Interviewer: Yeah! Especially for areas where the medical treatment is not sophisticated as much

Dr. Moran: Right! That's such a good point. In developing countries, eye drops would be much more preferable, easier to administer, easier to demonstrate to people this is what you do - sophisticated medications are more difficult to educate to people and more expensive

Interviewer: Well hopefully that's where our direction is going - cheaper - but we'll see.

14:23
Interviewer: So you said you would prefer eye drops but with a contact.

Dr. Moran: I would, because if you are familiar with contacts, then you're used to putting them in and having them in correctly. I've never had any experience with that so I would have to adjust but I would prefer the drops.

Interviewer: I think for the nanoparticles, something is going to be in your eyes for a really long time.

Dr. Moran: Is it irritating if you know it's in there? It's nanoparticles, they're tiny, and you wouldn't really know it's in there.

Interviewer: It would dissolve your cataracts protein at first, but later as it degrades, it would start to lose its function. But it's getting degraded so the cataract will start overpowering, then of course, you have to put it in again. So it's kind of like a cost and effect - do you want an eyedrop that you'll have to put in really often/regularly (ex: taking 3 times a day) or have nanoparticles that will eventually lose its function and you have to reapply it eventually but it's gonna last a while and you don't have to do anything about it - we're just wondering which one would people

prefer if they really have to choose. At this point, we are uncertain of the side effects, I mean we are fairly certain that there aren't any side effects to any of our current treatments but there could potentially be some - but as of right now, we are not aware of any.

Dr. Moran: Would you be more worried about side effects of the nanoparticles than you would from non-nanoparticles eyedrops.

Interviewer: Because one of the problems for the eye drop is we are not sure if our eyedrops are going to be lens-specific -- we don't know if once it's put in the eye, if the protein made is going to dissolve in other parts and eventually only a little bit goes to the lens. So, we are not sure if we can make it to be lens-specific enough so you'll see a significant effect of treating your cataract. But if it's nanoparticles, we can literally just put the nanoparticles in your lens so the protein will actually be in your lens.

Dr. Moran: So to put the nanoparticles in the lens, is that through an eyedrop or do you have to have an instrument that goes into the lens?

Interviewer: I'm pretty sure it's an eyedrop but the particle itself we can direct it or do something with it. Because if it's just a normal eyedrop, we are literally just putting proteins into the solution and the solution is going to diffuse hoping it would get to the lens but it might not necessarily. So, that might be something we might need to work on is it not invasive so we don't want to inject it directly to the lens but it has to be not dispersed to the point where we have to apply too much of the protein.

Dr. Moran: Because I know from the Phacoemulsification, to get into the lens, it was quite invasive. That's the challenge.

Interviewer: That's something that's actually still part of our research -- though we have the proteins and have all that. The nanoparticles are potentially beneficial because they last longer but then, the fact that they're such a new technology also means that we need to do a lot more research into that.

Dr. Moran: I would say that if you were to survey the general population, people are generally into something that can be put in once and ask for long time. Most drugs have done that way like gradual diffusion of the drug. So overtime, that's just probably where you want to go but initially when you're determining how effective it is it's hard to say how effective it would be with the regular infusion of the eye drops and then to determine it over time it would be very difficult but I could see it's progressing to that.

I'll tell you a funny story: the doctor forgot to ask whether I want it near-sighted or far-sighted until I was lying there my eyeball was frozen and there's this big green gum over me and he said "Oh by the way, I forgot to ask you - do you want far vision or near vision?" And I was like "you're asking me now?" And he was like "yeah, you have to choose now". I'm like "thanks a

lot.”. And I was afraid to say it wrong so I asked “is far vision when you can see far or is far vision when you cannot see far and can only see near” and then I said “Okay, look, I only want to wear glasses for reading”. He said “Ok”. Done.

So it wasn’t a very well research or informed. He just spurred the moment. Quite funny.

Oh also when he was telling me about the lens you know, you put it in the same hole, far into the eye. And I said like but what if it doesn’t. He said, it does. And I said what if it really doesn’t. He was like, it will… don’t ask me any more questions. HAHA

That’s what is significant about your research because the eye -- what did they say? The eye is the mirror of the soul. The eye is so critical - you don’t realize until it starts deteriorating -- just how much you’re dependent on it to work efficiently so I don’t take it for granted. It’s not often you meet somebody who had cataract at 30.

20:37 - End