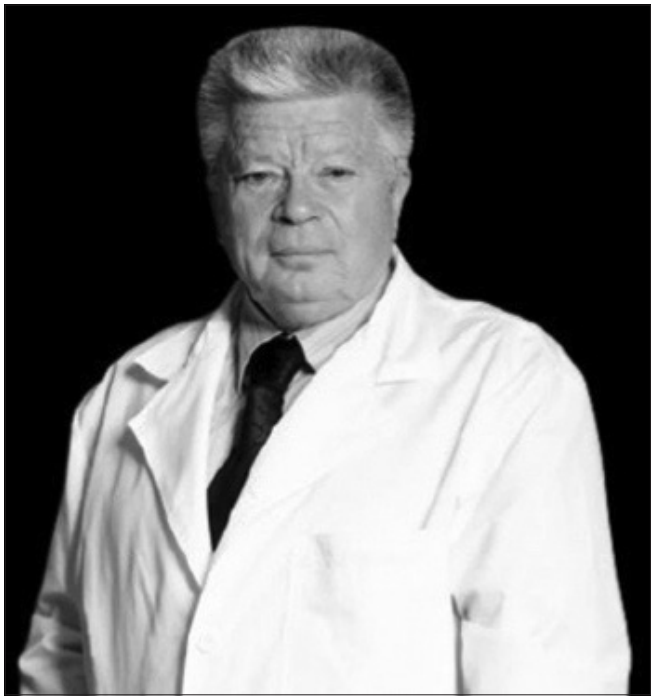
Dr. Svyatoslov N. Fyodorov: From Russia, with love



Svyatoslav N. Fyodorov (1927–2000)[1]

"He was a visionary. He was always working, always thinking, always trying to make things better." - Robert H. Marmer, MD[2]

Svyatoslav N. Fyodorov was a Russian ophthalmologist who was more far-sighted than the patients for whom he developed a cure to rid them of their glasses.

He was born on August 8, 1927, in the town of Proskurovo (now Khmelnitsky) in Ukraine. As a child he wanted to become a pilot, and not an ophthalmologist. After his graduation, he went to the Preparatory Aviation School in Yerevan. When he was 18, he lost a foot in an accident during flying lessons and it was then that his passion changed to medicine. He graduated from Medical Institute in Rostov-on-Don in southern Russia in 1952.[3] After his post-graduation in 1957, he headed the department in the Cheboksary Branch of State Institute of Eye Diseases. In Fyodorov's opinion, ophthalmology was the best medical specialty. He worked in many hospitals in different Russian towns, but he wanted to do something other than routine ophthalmic practice.

In 1960, he developed and implanted the first artificial crystalline lens in the Soviet Union. It was so revolutionary, even for the Russians, that the Soviet authorities condemned it as "anti-physiological". *"I had to struggle for this matter. I was opposed by all the professors in Russia and the Soviet Union. I broke medical canons by introducing new technology and those who violate canons are revolutionaries, pioneers. If they emerge victorious, they become popular,"* he said in an interview.[2] The Intraocular Implant Club was founded in 1966 to promote research in the field of intraocular lens implantation which allowed the unhindered exchange of ideas among surgeons. Sir Harold Ridley was the President and Dr Fyodorov was one of the founding members.[4] He developed a lens, Fyodorov-Zakharov Sputnik lens with iris clips which had good postoperative results with minimal complications and was widely used.[4]

Undeterred by criticism, he developed surgeries for cataract, early-stage glaucoma called scleroplasty, and methods of microsurgery.[2,4] He was amongst the earliest surgeons to consider glaucoma as an ischemic disease of the anterior segment of the eye.[5]

He developed a surgery for correcting myopia and called it keratotomia. A young boy visited Dr Fyodorov with eye injuries following a shattered spectacle after a fistfight. The glass pieces were carefully removed by the surgeon. He noticed that as the corneal wounds healed, his vision also showed marked improvement. This prompted him to make precise surgical cuts on a patient's cornea to replicate the cuts he saw on the boy. Today, it is better known as anterior radial keratotomy.[6] He practiced on rabbit eyes to perfect the number and depth of incisions.[7] In November 1979, at the first Keratorefractive Society meeting, he introduced this surgery. A month later, Fyodorov and Durnev reported 676 cases of radial keratotomy done on eyes with myopia ranging from 0.75–6 diopters. Nearly 84% achieved 20/50 or better-unaided vision while 46% had 20/25 or better-uncorrected vision.[8] He also invented a diamond knife for this surgery.[5] While his extraordinary results have not been replicated or reported, his work inspired many ophthalmic surgeons in other continents to try, modify, and develop the procedure. In the field of keratoplasty, he proposed grafts of larger diameter for penetrating keratoplasty and developed the Fyodorov-Zuev model of keratoprosthesis.[5]

Although laser procedures have overshadowed and replaced scalpel based procedures, this was certainly a breakthrough which laid down the foundation and principles for all other refractive surgeries. Today, while the procedures are more precise, safe, and simple, they hardly depend on the dexterity or finesse of the surgeon.

A man of many faces, he was also a shrewd businessman. He set up the Research Institute of Eye Microsurgery in Moscow in 1986 and many eye microsurgery clinics and hospitals in different towns and cities of Russia as well as Italy, Poland, Germany, Spain, Yemen, and UAE, including an eye treatment center aboard a ship, "Peter I."[2,3] He developed a conveyor-belt technique for patients, who lay on operating tables which rotated from surgeon to surgeon, each being responsible for a particular step of the surgery, allowing less than 15 min for each surgery.[9]

In 1994, he was awarded the highest professional honor –"an outstanding ophthalmologist of the 20th century" at the International Congress of Ophthalmologists in Canada.[10] A practicing capitalist, he created his own party and even campaigned for the President of Russia in 1996.[3] Although he lost, there is no denying the influence he had on the ophthalmic fraternity and the outside world at large. In 2017, a street near the Eye Microsurgery Institute was named after him.[11]

Beyond medicine, he kept himself busy with horse riding, swimming, and hunting.[2] *"We must make people's lives better, so that they can see well, so that they will be comfortable in this*

clinic, in Tambov, so that they can live well all over our country. This is the goal that unites all of us. This is a wonderful goal," he said in a ceremony celebrating the anniversary of one of his microsurgery eye clinics. He died in a helicopter crash on June 3, 2000, when he was returning from the same ceremony.[2]

Dr Fyodorov broke barriers, challenged conventions and often antagonized colleagues with his methods but he never ceased to astonish.

Mrittika Sen, Santosh G Honavar

Ophthalmic and Facial Plastic Surgery and Ocular Oncology Service, Center for Sight, Hyderabad, Telangana, India.
E-mail: mrittika24sen@gmail.com

References

1. Available from: https://www.mntk.irkutsk.ru/fedorov/?lang=en [Last accessed on 2020 Nov 11].
2. Available from: https://russiapedia.rt.com/prominent-russians/science-and-technology/svyatoslav-fyodorov/. [Last accessed on 2020 Jul 18].
3. Babich G. Svyatoslav N. Fyodorov, MD (1927-2000). Arch Ophthalmol 2000;118:1594.
4. Available from: https://www.iiiclub.org/mission.html. [Last accessed on 2020 Nov 02].
5. Available from: http://www.mntk.ru/mntk-moscow/fedorov/Scientific/. [Last accessed on 2020 Nov 10].
6. Available from: https://www.sciencealert.com/an-outdated-surgery-technique-left-this-woman-s-eye-looking-like-a-gem. [Last accessed on 2020 Jul 18].
7. Available from: https://www.npr.org/templates/story/story.php?storyId=6249164. [Last accessed on 2020 Jul 18].
8. Neumann AC. Interpreting PERK present and future data. J Refract Surg 1986;2:198-200.
9. Available from: https://www.theguardian.com/news/2000/jun/07/guardianobituaries.isobelmontgomery. [Last accessed on 2020 Jul 18].
10. Available from: https://www.mntk.irkutsk.ru/fedorov/?lang=en. [Last accessed on 2020 Jul 18].
11. Available from: https://moscowseasons.com/en/news/burdenko-gaaz-and-fyodorov-ten-moscow-streets-named-after-hero-doctors/. [Last accessed on 2020 Nov 02].

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Access this article online

Quick Response Code:	Website: www.ijo.in
	DOI: 10.4103/0301-4738.301286

Cite this article as: Sen M, Honavar SG. Dr. Svyatoslov N. Fyodorov: From Russia, with love. Indian J Ophthalmol 2020;68:2660-1.