History of Ophthalmology

http://doi.org/10.31288/oftalmolzh202237478

Professor Susanna Aleksandrovna Barkhash, the founder of pediatric ophthalmology in Ukraine (on the occasion of the 110th birthday)

N. F. Bobrova

SI "The Filatov Institute of Eye Diseases and Tissue Therapy of the NAMS of Ukraine"
Odesa (Ukraine)

This article is to commemorate the 110th birthday of Professor Susanna Aleksandrovna Barkhash and presents data on her life, activities as a doctor and a researcher, as well as her contributions to the advances in pediatric ophthalmology in Ukraine. S.A. Barkhash was an outstanding pupil of Acad. V.P. Filatov who came to the conclusion that she was an ideal person for the position of the first chief of the pediatric department which he established at the institute in 1946. She was a founder of pediatric penetrating keratoplasty and accumulated the world's greatest experience in this procedure (756 operations) which has not been surpassed so far. Professor S.A. Barkhash was heading the department over 30 years. During that period, there were publications on numerous issues of pediatric eye disease, and numerous methods of diagnostic evaluation and treatment were described, which are still used by the department in routine diagnostic evaluation and treatment of patients.

When face to face we cannot see the face.
We should step back for better observation.
Sergei Yesenin, 1924

Professor Susanna Aleksandrovna Barkhash (Fig. 1), a pioneer of pediatric ophthalmology in Ukraine, is rightfully considered one of the Acad. V.P. Filatov's outstanding pupils and a part and parcel of the Filatov's school of ophthalmic science [1, 2].

Acad. V.P. Filatov arrived at the establishment of the first pediatric ophthalmology department in Ukraine when his achievements in corneal transplantation, plastic surgery and tissue therapy had already been globally recognized. It is interestingly that some states not only at that time, but even now do not have (a) specialty services to take care of pediatric eye patients and/or (b) national pediatric ophthalmology schools. At that time, pediatric eyes were operated on by the eye surgeons specializing in adult patients who had no possibility for reviewing, generalizing and assessing the results of their work due to rare incidence of congenital ocular abnormalities.

In addition, there were only isolated reports of pediatric corneal transplantations. The largest series of pediatric corneal transplantations reported by that time was that by Anton Elschnig, an ophthalmologist from Prague (cited by Barkhash [3]). In 1920 to 1930, he reported on 35 pediatric corneal transplantations: clear engraftment occurred in no patient, whereas complications were observed in many

Photograph 1. Professor Susanna Aleksandrovna Barkhash, the first head of the Department of Pediatric Ophthalmology (1946 – 1976) at the Filatov institute

patients, including 10 with graft failure. Another famous ophthalmologist, Ascher (cited by Barkhash [3]), found graft failure in 8 of 10 children who underwent corneal transplantation; he cautioned ophthalmologists not to perform corneal transplantation in children.

It is natural that the opinion of these well-respected scientists was taken unconditionally by many ophthalmologists, which posed a barrier for continued development of pediatric keratoplasty. Therefore, a strong opinion was formed that penetrating keratoplasty in a child should be postponed until the child reaches an adult age. However, deep amblyopia that developed during such a long period of time was severe enough to level the achieved anatomic results, and visual outcome was low even if engraftment was clear.

Acad. V.P. Filatov decided to break down the stereotype and in 1946 established the pediatric department at the institute which he was heading. He took a meticulous approach to the recruitment of the head for this department, because he required not only a surgeon of great courage, but also an experienced clinician with an analytical mind in science, an unstressed person, importantly, with organizational skills and experience in working with children, and, if possible, with a degree of candidate of science in medicine. V.P. Filatov came to the conclusion that S.A. Barkhash, whom he had got to know during the enforced wartime evacuation of the institute to Central Asia, was an ideal person for that position.

Susanna Aleksandrovna Barkhash was born in the town of Kokand, Uzbekistan, in 1911, and graduated from the medical institute of Tashkent. She worked as a pediatric ophthalmologist, was a member of mobile teams combating trachoma, researcher at the Turkmen trachomatous institute, ophthalmic assistant at the eye clinic of Ashkhabad medical institute, director of the branch of the trachomatous institute, etc. In 1944, S.A. Barkhash defended her Cand Sc (Med) thesis entitled "Blindness and its causes in Turkmenistan" [1]. She was awarded a title of Merited Doctor of Turkmenistan for her selfless therapeutic and organizational work, and elected a member of the City Council of the town of Mary [4].

After Acad. V.P. Filatov invited S.A. Barkhash to move to Odesa, she became a doctoral student at the institute. In December, 1946, she headed a newly established pediatric ophthalmology department, and was heading the department over 30 years, until 1976 (Fig. 2).

In her doctoral dissertation "Corneal transplantation in children" (1957), S.A. Barkhash fulfilled successfully the academician's task of developing clinically a technique for pediatric penetrating keratoplasty [3]. The original dissertation is on file in the Filatov Institute Scientific Library. This work was remarkably comprehensive and thorough, with its textual material encompassing a lot of clinical material (with a series of 242 children that had undergone corneal transplantation). The 481-page dissertation contained 7 chapters, a conclusion, references and appendices. In addition to an extensive

Photograph 2. Professor Susanna Aleksandrovna Barkhash conducts an eye examination for children before surgery (the photograph is being published for the first time)

critical review of literature and analysis of the causes of pediatric blindness, there were 5 chapters devoted to (1) the methods of a preoperative pediatric eye examination, features of the Filatov's technique of partial penetrating keratoplasty including allocation of FM-3 and FM-4 trephines, autoconjunctival stripe graft reinforcement, postoperative course, and prevention and analysis of complications. At that time, corneal leucoma was most commonly caused by infections (measles, scrofulous keratitis, neonatal conjunctivitis, and dysentery), and less commonly, by burns, trauma, etc. The focus of chapter 5 was on treatment outcomes, which were divided into biological and functional treatment outcomes. Chapter 6 analyzed the efficacy of pediatric keratoplasty in the presence of amblyopia, and contained the description of exercises for improvement of visual function. Chapter 7 was unique not only for that time but also for this time, and contained data on operation for subtotal keratoplasty in 70 eyes of 68 children of different ages using the technique by Acad. N.A. Puchkovska. Of these eyes, almost a half (31) were those of children under 6 years of age, 10 of children under one year, and the youngest infant was 6 months. Trephine diameters ranged from 7 mm to 10-11 mm for staphylomatous leucoma and corneal graft fixed with sutures. Glaucoma surgery was conducted before, simultaneously with or at the end of the transplantation procedure.

Given that the surgical armamentarium of that time was rather limited, and that 10/0 atraumatic nylon sutures were introduced decades later, the surgeon had to be a real virtuoso medical professional to succeed. Nevertheless, there was no graft failure, and the engraftment was clear or semi-clear in 35 eyes.

S.A. Barkhash noted that a satisfactory or better visual treatment outcome was achieved in 63.2% of pediatric eyes that had undergone partial penetrating keratoplasty. Any graft found to be opacified after subtotal keratoplasty was considered suitable for repeat partial penetrating

keratoplasty. Twelve surgeries of this type resulted in a restoration of some vision in 3 children (in one of these children, visual acuity improved from light perception to 0.4).

Therefore, S.A. Barkhash was the first to demonstrate a high clinical efficacy of penetrating keratoplasty for the treatment of blindness from leucoma in children of different ages. Not only she had become a pioneer of pediatric penetrating keratoplasty, but later she accumulated the world's greatest experience in this procedure (756 operations) which has not been surpassed so far [5].

Her and her department's research and clinical interests included practically all issues of pediatric ophthalmology. Under her guidance the department became a leading pediatric eye care, research and organizational center not only in Ukraine, but also in the USSR. The surgical field allowed not only restoring vision in children from all over the country, but also conducting different research projects with the involvement of department staff and postgraduate and doctoral students from different republics and foreign countries.

S.A. Barkhash extensively contributed to the diagnostic and treatment approach to pediatric eye tumors. Particularly, she developed a technique for removing extensive angiomas of the lid and orbit [6] and optic nerve tumors [7]. An ultrasound-based classification of retinoblastomas [8] was developed by S.A. Barkhash and R.K. Mamchur and used as a subject of Cand Sc (Med) thesis by VV. Trinchuk. At present, ultrasound studies are still used by the department in routine diagnostic evaluation of patients with retinoblastomas.

The diagnosis and surgical management of pediatric ocular trauma was the subject of the I.S. Cherkasov's Cand Sc (Med) thesis "Pediatric ocular trauma" (1954). His doctoral dissertation "Congenital glaucoma: Differential diagnosis and efficacy of treatment" (1968) focused on advancing the diagnosis and surgical methods of management of the disease, and was also prepared under the guidance of Professor Barkhash. Subsequently, Dr. Cherkasov was chairman of the Department of Ophthalmology at the Pirogov Odessa Medical Institute over more than 20 years.

E.I. Starodubtseva defended a Cand Sc (Med) thesis on the formation of a stump of an enucleated eye and, subsequently, in cooperation with S.A. Barkhash, she studied the patterns of inheritance of eye diseases. The methods for managing the issues related to surgical correction of different types of congenital upper eyelid ptosis were intensively developed in the department. Dr Khrinenko proposed a modified external dosed resection of levator palpebrae superioris [9]. This became a classical method, its efficacy for the correction of uncomplicated as well as complicated ptoses has been proven over decades, and it is still widely used.

Congenital cataract surgery was a special subject of Prof. Barkhash interest [10-14]. At that time, the techniques for removal of zonular cataracts were unsatisfactory. The viscous lens masses that were failed to be removed caused chronic uveitis, pupillary constriction, and the development of ocular hypertension leading to secondary glaucoma. Costenbader and Albert in 1957 "would unequivocally advise against surgery in unilateral congenital cataracts" (cited by Baborova and Skripnichenko [15] due to serious complications and the absence of postoperative vision. S.A. Barkhash and L.D. Pikalova [12], however, designed a technique of optic iridectomy for zonular cataract, which was capable of preventing deprivation amblyopia, preserving accommodation, and somewhat improving visual acuity. A.I. Poteenko's Cand Sc (Med) thesis was devoted to the development of a surgical technique for congenital cataract removal with provisional suturing [11]. The surgical treatment of pediatric congenital cataracts (including the prognosis, operation technique, secondary glaucoma and optical treatment outcome) was the most common subject of Prof. Barkhash publications, with five articles and numerous abstracts and reports at various conferences devoted to the subject.

While being a newcomer to the pediatric ophthalmology department, I was lucky to communicate personally to Prof. Barkhash, who, at that time, retired. At that time she lived alone (her husband had died in an air crash, while her daughter had emigrated from the country) at Cheremushki in a standardized, mass-produced five-storey apartment block that had been built for the staff of the institute. Prof. A.P. Pakhomova, another retired person, lived in an apartment across that of Prof. Barkhash. Whenever I visited Prof. Barkhash, she invited Antonina Petrovna to join us, because the two professors were friends and liked to visit each other. We had very interesting conversations while having tea; they were beneficial in building my professional knowledge in the complex and versatile field of pediatric ophthalmology and oncology. Issues of congenital cataract surgery were interesting to us and were the most common subject of discussion. The advent of phacoemulsifiers and vitreous cutters has enabled easy, atraumatic, and, importantly, complete removal of viscous lens masses, which drastically improved postoperative healing and surgical outcomes. I will remember Susanna Aleksandrovna as a high-grade professional of critical thinking but a very humble, kind, tolerant and charming person with self-possession and manners of an old-school intelligentsia.

Another noteworthy personality trait was her integrity. Despite being retired, she was still involved in the science activities at the institute, and published the article named 'Current problems of the surgical treatment of congenital cataract in children' in the August 1987 issue of OFTALMOLOGICHESKII ZHURNAL (Ophthalmological journal) [14]. In this article, she discussed time frames and techniques used in surgery for different types of congenital cataracts, stressing that decisions should be based on late, but not early treatment outcomes.

Photograph 3. Professor Susanna Aleksandrovna Barkhash, the Executive Secretary of the Ukrainian Ophthalmological Society (the photograph is being published for the first time)

Prof. Barkhash authored 158 publications on a wide variety of issues of pediatric ophthalmology. In addition to the above-mentioned issues, these included combination treatment of orbital sarcoma in children [16], retinal detachment surgery [17], open probing in congenital dacryocystitis [18], and diagnostic evaluation and treatment of myopia [19]. Of special note are her articles on the public pediatric eye care and changes in the relative contributions of different diseases to the overall pediatric eye disease in Ukraine [20]. In addition, Prof. Barkhash contributed the chapters on corneal transplantation in children and clinical manifestations and treatment of pediatric ocular tumors to 'Basics of corneal transplantation' (1971) and 'Tumors of the eye, orbit and ocular adnexa' (1978), respectively, the two monographs written by the institute staff members and edited by Acad. Puchkovskaia [21, 22].

Four doctoral dissertations and 7 Cand Sc (Med) theses have been prepared under the guidance of S.A. Barkhash, including – aside from that by Prof. Cherkasov – those by Prof. N.A. Iushko, the future chair of Ophthalmology at the medical institute of Krasnodar, and I.V. Kliuka, the founder of the Laboratory for Binocular Vision Disorders at the Filatov institute.

Prof. Barkhash combined a variety of clinical research activities with extensive public activities. For years (1966 -1978) she was the Executive Secretary of the Ukrainian Ophthalmological Society (Fig. 3). She was awarded numerous certificates of appreciation (particularly, those from the Presidiums of the Supreme Soviets of the Turkmen and Ukrainian SSR) and the Order of the Badge of Honor.

The staff members of the pediatric ophthalmology department keep alive the memory of Professor Barkhash and of the pioneer staff members of the department, I.S. Cherkasov, L.D. Pikalova, E.I. Starodubtseva, V.P. Khrinenko, M.P. Litvinova, A.S. Grechko, V.V. Trinchuk, and many others [23] whose scientific ideas and practical developments in the field have formed the basis for subsequent advances in the pediatric ophthalmology in Ukraine.

Acknowledgement: *The author would like to thank N.E. Usenko and M.M. Sentina from the Institute's Scientific Library for their assistance in selecting the literature.*

References

1. Kovalenko NB. [Pages of our history]. Odessa: Aprel;2018. Russian.
2. [In memoriam of Prof. S.A. Barkhash]. *Oftalmol Zh.* 1990;(2):127-8. Russian.
3. Barkhash SA. [Corneal transplantation in children]. [Dissertation for the Degree of Dr Sc (Med)]. Odessa; 1957. Russian.
4. Obrubov AS. ['Children of darkness, children of night, Are looking at the East with their eyes widely open …' On the 105th birthday of Prof. Susanna Aleksandrovna Barkhash]. *Rossiiskaia detskaia ophthalmologiia.* 2016;(4):55-7. Russian.
5. Pleskova AV. [Nosological structure of corneal opacities in children: a background]. *Rossiiskaia pediatricheskaia oftalmologiia.* 2014;(2):39-43. Russian.
6. Barkhash SA. [Surgery of deep and extensive angiomas of the eyelid and orbit in children]. *Oftalmol Zh.* 1970;25(2):102-7. Russian.
7. Barkhash SA. [Surgical treatment of tumors of the optic nerve in children]. Oftalmol Zh. 1964;19:3-8. Russian.
8. Barkhash SA, Marmur RM, Trinchuk VV. [Ultra-acoustic diagnosis of retinoblastomas]. *Oftalmol Zh.* 1968;23(6):419-23. Russian.
9. Barkhash SA, Khrinenko VP. [Surgical treatment of ptosis complicated by synkinesis]. *Oftalmol Zh.* 1972;27(8):567-70.
10. Barkhash SA. [Surgical treatment of congenital cataracts]. Oftalmol Zh. 1961;(3):157-66. Russian.
11. Barkhash SA, Poteenko AP. [On methods of surgical treatment of congenital cataract]. *Oftalmol Zh.* 1966;21(6):427-32. Russian.
12. Barkhash SA, Pikalova LD. [On the prognosis of surgery for congenital cataract]. *Oftalmol Zh.* 1968;23(7):483-9. Russian.
13. Barkhash SA, Pikalova LD, Grechko AS. [Secondary glaucoma after extraction of congenital cataract in children]. *Oftalmol Zh.* 1975;30:204–6. Russian.
14. Barkhash SA. [Current problems of the surgical treatment of congenital cataract in children]. *Oftalmol Zh.* 1987;(8):475-6. Russian.

15. Bobrova NF, Skripnichenko ZM. [Toxic, congenital and secondary cataracts]. Odessa: Izdatelskii tsentr; 2017. Russian.
16. Barkhash SA, Panfilova GV, Guzarskaia MV. [Combined treatment of orbital sarcoma in children (late observations)]. *Oftalmol Zh.* 1976;31(8):590-4. Russian.
17. Barkhash SA, Filatov SV, Kilimnik GIu. [Clinical observations on the surgical treatment of retinal detachment in children]. *Oftalmol Zh.* 1968;23(2):102-6. Russian.
18. Barkhash SA. [On the treatment of congenital dacryocystitis by the technique of open probing]. *Oftalmol Zh.* 1961;6:371-2. Russian.
19. Barkhash SA, Novokhatskiĭ. [Optical and ophthalmological characteristics of congenital myopia]. *Oftalmol Zh.* 1974;29(3):176-80. Russian.
20. Barkhash SA, Pil'man NI, Kliuka IV. [Achievements in the field of protecting the sight of children in the Ukrainian SSR]. *Oftalmol Zh.* 1967;22(7):497-501. Russian.
21. Barkhash SA. [Corneal transplantation in children]. In: Puchkovskaia NA, editor. [Basics of corneal transplantation]. Kyiv: Zdorov'iie; 1971:199-209. Russian.
22. Barkhash SA. [Clinical manifestations and treatment of pediatric ocular tumors]. In: Puchkovskaia NA, editor. [Tumors of the eye, orbit and ocular adnexa]. Kyiv: Zdorov'iie; 1978:204-216. Russian.
23. Bobrova NF, Tronina SA, Sorochinskaia RA, Sukhodoieva EA, compilers. [The 60th anniversary of the Filatov's school of ophthalmic science]. Odesa: Astroprint; 2006. Russian