Rev Mex Oftalmol. 2016;**90(Supl 1)**:69–76

Revista Mexicana de Oftalmología

www.elsevier.es/mexoftalmo

HISTORY OF OPHTHALMOLOGY IN MEXICO

The first Mexican ophthalmologists of the 19th century

Rolando Neri-Vela

Head of the Department of History and Philosophy of Medicine, Facultad de Medicina, Universidad Nacional Autónoma de México, Ciudad de México, Mexico

As Mexico gained independence, ophthalmology started its process of modernisation. There were attempts to create a school of ophthalmology. The pioneers in the European nations arrived in Mexico and our doctors travelled to Europe to learn new surgical techniques. The ophthalmoscope arrived in Mexico, and a Mexican school of ophthalmology with its own characteristics was created.

Special clinics and hospitals were founded for those with eye diseases in which the ophthalmologists earned great fame. Likewise, new curricula were created in the National School of Medicine, which included a professorship in the specialty, and a group of specialists was formed, which had and has a specialised journal.

For Rafael Lavista, José Miguel Muñoz is the "father of Mexican ophthalmology"[1]. Muñoz used the technique prescribed by Daviel - intracapsular cataract extraction. Luis Muñoz, the son of Miguel, told Lavista that he accompanied his father to operate on cataracts in his childhood. Many times he heard it said that his preference for the extraction method was based on the fact that with this procedure, the surgeon never made anyone blind. Furthermore, each time that he performed the procedure, he could see what he was doing, unlike what happened when he operated with a needle, a method that was not unknown to him and that he used exceptionally, with good results.[1]

During the early part of the 19th century, ophthalmology was taught in the Royal School of Surgery, where, among other skills, the students learnt how to "couch cataracts".

In 1833, when the Establishment of Medical Sciences was founded, the basics of the subject began to be taught, graduating the first medical surgeons that specialised in ophthalmology.

In Mexico in 1834, Ángel Binhagi proposed a plan to create a professorship of ophthalmology to the Ministry of Justice and Public Instruction. He said that it "being desirous to advance the sons of the country in the science of ophthalmology that is so unknown, and so essential for medical practice, I take the liberty of supporting Your Excellency if it so pleases you to take the initiative to pass by the courses so that the pending study reform plan be taken into consideration"[2]. He signed the proposal on 9 May 1834.

The offer was rejected, since it was argued that the organisation and structure of the eye were taught in the anatomy class, its functions in physiology, its diseases in internal and external pathology, and the feasible and necessary operations in surgical medicine.[2,3]

After the Establishment of Medical Sciences was founded, it is known that the first surgeon who introduced the practice of eye surgery in Mexico was the Frenchman Carron du Villards, who was solidly in favour of the technique of "couching" the cataract;[1] in 1853 he published a work on the subject entitled *Adversaria Ophtalmologica, es decir, Examen crítico y oftalmoscópico sobre algunos puntos de controversia acerca de la catarata* [Opposition to Ophthalmology: i.e. Critical and ophthalmoscopic exam of some points of controversy regarding the cataract].

In Mexico City, José María Vértiz, who had studied the specialty in Paris at the side of Louis-Auguste Desmarres, directed a clinic for eye patients that had been founded by Francisco Fagoaga, marquis of Apartado. He came to perform 102 cataract operations in this institution and in the Hospital for the Poor.[4,5] As the years passed, when Fagoaga's widow died and the clinic could not be economically sustained, it was moved to Revillagigedo street, where Fernando López

E-mail: drnerivela@hotmail.com

continued caring for patients until 1907, when this service disappeared completely.[6]

José María Vértiz was a well-known person of great importance in 19th century Mexican medicine. He came to be a professor of surgery at the National School of Medicine[7] and later its director. In 1841 he was named the director of the Hospital de San Andrés.

José María Vértiz and Francisco Ortega stood for the competitive examination that took place in 1846 to hire a professor of surgical medicine in the National School of Medicine. The secret questions to be drawn included, in the first round, the cataract operation, in the second round the topic of tenotomy for strabismus patients, and, in the third round, the cataract operation again.[8]

In 1869, Rafael Lavista, when he stood in competition for the adjunct professorship in surgical medicine, wrote a treatise as a thesis on the diverse types of cataracts and their surgical treatment. It is more of a complete treatise than a thesis, and it was called a masterpiece.[9]

Agustín Andrade y Pastor (Fig. 1), born on 3 May 1833 in Paris, died on 5 December 1866, had the merit of being among the first to treat glaucoma in Mexico by iridectomy and to use metal channelling of the posterior segment of the eye to treat retinal detachment. The founder of the first ophthalmological dispensary in Mexico, he worked at the Hospital de San Andrés and was the first director of the Instituto Valdivieso, today the Ophthalmological Hospital of Nuestra Señora de la Luz, in which he was the creator of a true school of the specialty.

In 1856, doctor Ángel Iglesias y Domínguez (Fig. 2) returned to the country from Europe. He had graduated as a doctor in October 1853 and lived at San Ildefonso number 6 or 7.[10] He was the bearer of all the advances attained there, among them the ophthalmoscope, which represented a true advance for the diagnosis, treatment and prognosis of both eye and systemic diseases.

On 21 December 1859, the Board of Professors of the School of Medicine were of the opinion that it was time to open a contest for the position of adjunct professor of medical physics. The call for applications was sent to be printed in the newspapers of Mexico City. Only Ángel Iglesias registered for the competition. He chose the topic *Physical phenomena of the physiology and pathology of the eye* for his thesis.[11] In accordance with Article 22 of the School Regulations, on 8 March 1860 the individuals who were on the panel were announced: Vargas (chair), Ignacio Erazo, Luis Muñoz, José Villagrán, Gabino Barreda, and, as a stand-in, Francisco Ortega,[12] extending the appointment as adjunct professor of medical physics on 13 March 1860.[13]

In 1867, Ángel Iglesias was an adjunct professor of the School of Medicine, and on 18 June of that year he requested two months leave to care for his shattered health and family problems, which was granted.[14]

Iglesias was the first to perform a cataract operation with the Von Graefe procedure (cataract extraction with iridectomy) in Mexico in 1868, and he published all the details and injuries from that surgery in the first two operations that he performed in Mexico using that method in *Gaceta Médica de México* [Medical Gazette of Mexico]. However, he preferred to use Critchett's scoop, as its form was adapted to the lens, which according to him performed better than Von Graefe's scoop.

Figure 1 Dr Agustín Andrade.

Figure 2 Dr Ángel Iglesias y Domínguez.

For the *Gaceta Médica de México*, Iglesias wrote "The ophthalmoscope: Examination of the eye by the ophthalmoscope (translation of the article by Dr Follin), Physical phenomena of the physiology and pathology of the eye, History of two cataract operations".

Thus, along with Doctors José María Vértiz, Domingo Arámburu and Lázaro Ortega, he cared for the sick at the Hospital de Jesús using the ophthalmoscope.[6]

One of the physicians who undoubtedly had great fame in Mexico in the second half of the 19th century was Manuel Carmona y Valle (Fig. 3), who was born in the city of Querétaro on 3 March 1832 and died in Mexico City on 24 October 1902. Carmona y Valle attended the Seminario Conciliar de México[15] and afterwards graduated from the National School of Medicine. He later studied physiology and ophthalmology in Paris, going on to teach ophthalmology upon returning to his country.

In February 1869, as the adjunct professor of physiology, he applied to obtain the vacant position of adjunct professor of clinical surgery.[16]

Upon the death of Francisco Ortega, Carmona y Valle directed the National School of Medicine for 10 years, from 1892 until his death. In 1882 and 1891 he was the president of the National Academy of Medicine, as well as the Pedro Escobedo Medical Society, the First National Medical Congress and the Second Pan-American Congress. He was the director of the Hospital de Jesús, and attended scientific meetings in Berlin, Rome and Moscow. He also presided over the Welfare Board. He was the first in Mexico to spread Donders' works on refraction, and those of Van Graefe on diseases of the fundus of the eye.

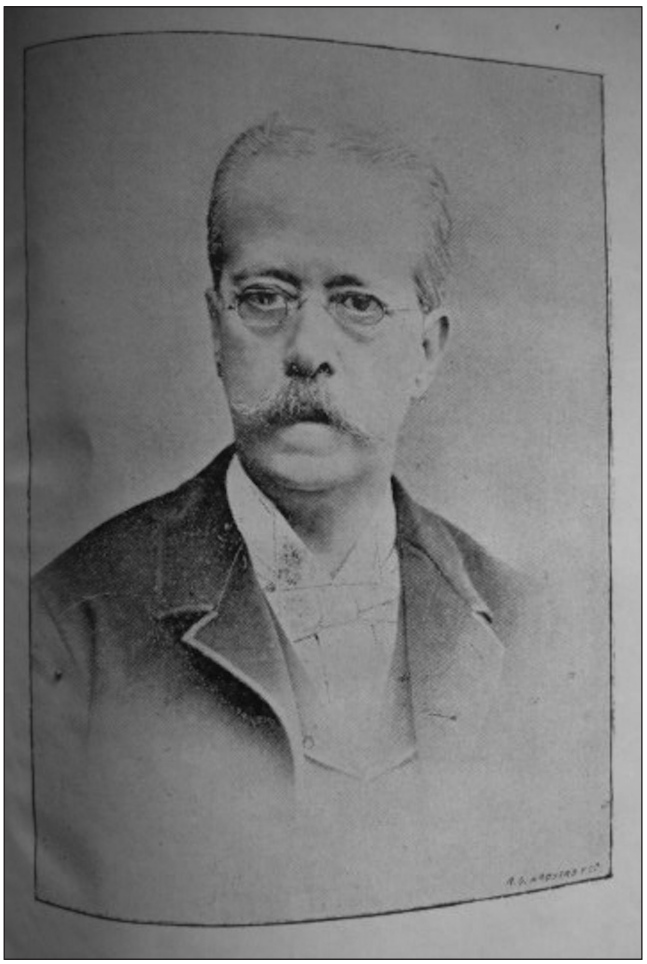

Figure 3 Dr Manuel Carmona y Valle.

His many contributions to medicine include the description of vernal keratoconjunctivitis, in its bulbar form, which is known as "Carmona y Valle's exuberant keratoconjunctivitis" in the world literature. He proposed lens extraction as a surgical method in keratoconus and in high myopia, and spread the use of the ophthalmoscope.

Carmona y Valle's ophthalmology clinic was located on 2nd street, number 10 in San Francisco, where he cared for patients every day from one in the afternoon and onwards, and on Tuesdays, Thursdays, and Saturdays saw poor patients for free.[17]

On 8 August 1873, Carmona was told that as the professor of clinical surgery of the School of Medicine and subdirector of the operating room at the Hospital de San Andrés, he would attend the Hospital Juárez every year, for a term of 6 months to give classes on clinical practice.[18]

He published *Lectures on clinical practice*,[19] practising ophthalmology in the Hospital de Jesús.

On 9 April 1886, he was appointed the director of the National School of Medicine by the president of the Mexican Republic; for that reason he was advised that he would have to agree to handle the corresponding matters every work day from 11 am to 12 pm,[20,21] and he took up the post on the 12th of the month.[22]

On 3 January 1889, Manuel Carmona y Valle requested that Hospital Valdivieso be the headquarters of the National School of Medicine ophthalmology professorship, which was accepted.[23]

We are indebted to Carmona y Valle for theory about refraction in the eye, already mentioned, the general, easy handling of the ophthalmoscope and the invention of a cataract surgery knife that bears his name. He performed all types of surgical eye operations in Mexico, consistent with the scientific knowledge of the times.

One of Carmona y Valle's disciples was Ricardo Vértiz Berruecos (Fig. 4), who was born in Mexico City in 1848. He studied at the Seminario Conciliar and later at the National School of Medicine.[24]

Years later, as a professor at the same School, Ricardo Vértiz became a professor of obstetrics by presenting the thesis *Purulent ophthalmia in newborns*.

Ricardo Vértiz practiced medicine at the Jesús and Concepción Béistegui hospitals. In 1872 he was admitted as a member of the National Academy of Medicine, of which he was vice president from 1881 to 1882.

One of his contributions to Mexican medicine was to introduce the Lister method to eye surgery. For cataract surgery he used boric treatments (borated lint), although with little success, as well as phenol treatments diluted by thousandths. He claimed that with these dressing the results were very positive, since there were no complications in a single patient, with the norm being immediate healing. He claimed that the patients healed completely in 4 or 5 days, and that there were cases who were cured completely in two and a half days. When healing did not immediately occur, there was no suppuration or conjunctival catarrh, and phenol treat-

ments were used in iridectomies, always with outstanding results.[25]

Ricardo Vértiz, deeply interested in eye diseases, undertook an extraordinary project to found what is currently the Ophthalmological Hospital of Nuestra Señora de la Luz. For many years he directed the Hospital de San Andrés ophthalmology department. On 1 July 1884, the president of the Mexican Republic appointed him professor of ophthalmology in the National School of Medicine, with an annual salary of 1,200.85 pesos.[26]

Fernando López y Sánchez Román, who was a student of Ricardo Vértiz, also participated with his contributions to the development of Mexican ophthalmology. He was born in Tlaltenango (now Ciudad Sánchez Román) in the department of Zacatecas,[27] now a state, on 5 November 1854, the legitimate son of Mariano López and Francisca Sánchez Román.

López y Sánchez Román enrolled in the National School of Medicine in 1873. The following year he was admitted as a candidate to the Military Instruction Hospital, and he was Francisco Montes de Oca's favourite disciple.

Upon graduating on 25 January 1879, he received his medical license on 13 October 1880, and was immediately appointed professor in the Military Hospital. On 1 November 1882, he received a commission from the federal government to go to Paris to perfect his knowledge of general surgery, as well as ophthalmology. He was a disciple of renowned ophthalmologists such as Louis de Wecker, Edmund Landolt, and Felix de Lapersonne, who were some of the greatest examples of European ophthalmology of their time.

Figure 4 Dr Ricardo Vertiz.

Fernando López performed cataract surgery with great mastery. He invented a device to discover simulated blindness, which is still a problem faced in medicine today, especially in the military and legal fields. Another of his specialities was correcting strabismus and he successfully performed pterygium resection, using a procedure he invented. He likewise performed iridectomy for glaucoma operations.

Daniel M. Vélez (Fig. 5), another renowned physician, enrolled in the School of Medicine on 28 December 1882 and was also a practitioner at the School of Military Medical Practice. His thesis dealt with *Vision hygiene*.[28] For four years he studied the specialisation of ophthalmology abroad, and in 1890 he was a delegate of the military medical corps to the International Medical Congress in Berlin. He later represented the Mexican government at the funeral of Louis Pasteur in 1895. He was a professor in the Hospital de San Andrés and in the School of Medicine. He belonged to the Mexican Society of Ophthalmology and Otorhinolaryngology. He passed away on 12 September 1935.

The following can be concluded from Daniel Vélez's service sheet found in the Faculty of Medicine's Historic Archive at the National Autonomous University of Mexico: on 6 March

Figure 5 Dr Daniel M. Vélez.

1895 he was appointed the head doctor of the anatomical works on the committee that had to create an anatomo-pathological museum in the Hospital de San Andrés, writing as a thesis for the position *Asepsis and antisepsis in eye surgery*. In 1895 he was appointed as honorary consulting professor of ophthalmology. On 10 April 1899, he was appointed adjunct professor of theoretical-practical ophthalmology in the National School of Medicine, and on 23 August 1901, the president of the Mexican Republic designated him interim professor of ophthalmological practice, with an annual salary of 1,200.85 pesos. By 21 April 1920, by agreement of the president of the Republic, he requested leave without pay, starting on the first of the month, from his post as professor of ophthalmological practice in the faculty of medicine, for the period during which he acted as professor of the same subject in the faculty of advanced studies. On 1 May 1920 he requested authorisation from the director of the General Hospital to give ophthalmology classes at the faculty of advanced studies, in the same room as Emilio F. Montaño, the professor of ophthalmology in the faculty. On 2 January 1923, the constitutional president of the United Mexican States named him clinical professor of ophthalmology.[29]

Vélez studied the diverse topics within ophthalmology with special dedication, tackling subjects such as hygiene, newborn eye prophylaxis, ocular hygiene in schools and cinemas, eye injuries at work and rational education for the blind. He also introduced the Braille method in Mexico to teach the blind to read. In 1907, he introduced retinography to Mexico.[30]

Manuel Uribe Troncoso (Fig. 6) was born in the city of Toluca where he carried out his preparatory studies prior to a degree in medicine in the Instituto del Estado de México.[31] On 26 December 1884 he applied for admission to the National School of Medicine.[32]

On 7 March 1890 he applied to take his general exam in medicine, surgery, and obstetrics,[33] which he took on the 24th of that month at 6 pm and on the 25th at 7 am, the latter in the Hospital de San Andrés. The panel members were Joaquín Vértiz, José Ramos, Erdozain, Miguel Zúñiga, Alvarado and Domingo Orvañanos.[34]

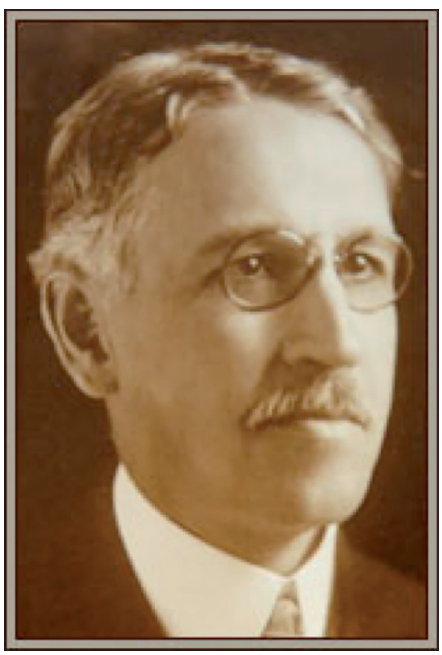

Figure 6 Dr Manuel Uribe Troncoso.

In 1899 he was appointed as a doctor at the Ophthalmological Hospital of Nuestra Señora de la Luz, and in 1900 as adjunct professor, by competition, of the ophthalmology professorship at the National School of Medicine. In 1915 he was a full professor of clinical ophthalmology in the same school.

On 11 December 1899, the president of the American Medical Association Section on Ophthalmology sent him a letter inviting him to read a work on local Therapeutics, with the general title "The rational use and limitations of therapeutic measures intended to promote the absorption of exudates within the eye-ball" at the meeting held at the Association's conference in Atlantic City from 5 to 8 June 1900.

In 1916, because of political difficulties that arose in the country, he was removed from his positions at the National School of Medicine and the department of School Hygiene, which he also directed. He went to New York, where he developed most of his scientific work, recognised worldwide. He died at the age of 90.

From 1890 to 1916, Uribe wrote 109 works out of 200 in total that were published. 35 of these, on various subjects concerning general medicine and hygiene, were highly influential. The remaining 74 were about ophthalmology. José A. Quiroz emphasised that in particular his work on the anterior chamber filtration angle (1905) should be mentioned, as it lead to a passionate debate with the prominent professor Leber from Heidelberg, who finally agreed that Uribe was right.[35,36]

In 1903, on Uribe proposal, regulations for vision tests in Mexico's primary schools were established.[37]

In the 20th century, Uribe published a treatise on *Internal Diseases of the Eye* and an *Atlas of Ophthalmoscopy*, which was translated into Spanish by Dr Sanz Astolfi.[38] Uribe Troncoso was responsible for founding the first ophthalmology journal in Latin America published in Spanish: *Anales de la Sociedad Mexicana de Oftalmología* [Annals of the Mexican Society of Ophthalmology], published in 1898.

Emilio F. Montaño, who would become a famous ophthalmologist, applied to enrol as a student of the National School of Medicine on 26 December 1884. On 18 February 1890, he requested to take the exam on general medicine, surgery and obstetrics at that school. He stood for his professional theoretical exam on 11 March that same year at 6 pm and the following day he continued with the practical exam at 7 am in the Hospital San Andrés.[39]

With particular expertise in physical optics and physiology, on 14 May 1919 Montaño finished his work entitled *Pequeña contribución al estudio del tratamiento del queratocono* [Small contribution to the study of the treatment of keratoconus], where he explained that this condition affects the cornea and causes myopia and that the drawbacks of combination lenses and contact lenses, which were difficult to tolerate for more than 1 hour, could be remedied. He proposed using Elliot trephination, which enabled lowering the intraocular pressure by opening direct communication between the anterior chamber of the eye and the subconjunctival lymphatic channels of the choroid. This work was published the

following year in the *Gaceta Médica de México* [Medical Gazette of Mexico].[40]

Emilio Montaño was an ophthalmologist at the Central Public Welfare Office on Revillagigedo street in Mexico City.

Enrique Graue Glennie, who was born in Mexico City, graduated from the National School of Medicine in 1897 after having spent several years in the Hospital de San Andrés and the attached ward for eye patients, the Instituto Valdivieso run by Ricardo Vértiz. He was also a practitioner at the Concepción Béistegui Hospital.[41]

Another famous Mexican ophthalmologist is José Ramos, born in San Luis Potosí, who was trained in Europe and upon his return to Mexico taught courses on the specialty. In Paris he was the head of Doctor Galezowski's clinic.[6] In 1893, he was part of the group of founding doctors of the Mexican Ophthalmological Society. He came to be the president of the National Academy of Medicine in 1896. He passed away on 26 February 1909.

Ramos was probably the first in the world to describe cysticercus in the eye.[42]

In the late 19th and early 20th centuries, José Ramos was a professor of internal pathology at the National School of Medicine, even though his specialty was ophthalmology. Nevertheless, his lessons were famous for his way with words, his elegant diction and his eloquence, together with his admirable scholarship.[43]

Mexican ophthalmological surgery at the end of the 19th century was on par with that in Europe, such that on 8 November 1899 doctor Lorenzo Chávez presented to the National Academy of Medicine a patient who had undergone surgery for strong myopia, depressing the transparent lens, in both eyes. He declared his belief that it was "the first operation of its kind that, in an intentional and thought-out manner" had been performed in Mexico.[44] He also successfully performed intracapsular extraction on hypermature cataracts and defended capsulectomy in cataracts. He distinguished ophthalmoplegic migraine for the first time among Mexican physicians and was the first to describe embolus of the central retinal artery, necrobiotic keratitis and infectious choroiditis caused by typhus, as well as writing about retinal cysticercus.

Lorenzo Chávez y Aparicio was admitted to the National School of Medicine in 1878 and applied to its director to take his general exam in medicine and surgery on 24 April 1884.[45]

Lorenzo Chávez was the director of the Ophthalmological Hospital of Nuestra Señora de la Luz from 1898 to 1911.

In 1895 he presented to the National Academy of Medicine a work to take the chair of the corresponding area, that among other things dealt with perfecting the surgical technique of enucleation, for which he used hook-scissors of his own invention.[46] Chávez was the head of the Galezowski clinic and physician at the Hospital de Regina, where he cared for patients with eye diseases and enjoyed very good acceptance as a *clinical ophthalmologist (sic) and surgeon*.[46]

Federico Ábrego, another of the physicians who was part of the ophthalmologists who gave fame to the specialty in the early years of the 20th century, did his preparatory studies in the state of Veracruz, entering the National School of Medicine in January 1886. Starting in 1888, he was an aspiring student in the Military Instruction Hospital and he applied to the National School of Medicine to take his general exam in medicine, surgery and obstetrics on 14 March 1891.[47]

Although Mexico's scientific activity was conducted in the Republic's capital, great strides were also made towards modernising medicine, and thus ophthalmology, in the country's interior.

In 1893 in the city of San Luis Potosí, Antonio F. Alonso was already speaking about the advantages of antisepsis in ophthalmology. He started his great scientific production having reported cases of tumour-related enucleation, myopia treatment by lens extraction (this appears to the be the first time in Mexico), blepharoplasties, iridectomies, puncture to treat retinal detachment, use of scleral grafts on eye prostheses, on the Lagrange method of glaucoma treatment, his cataract method and his personal keratoconus technique (that was included in the work by the famous Fuchs). Most of the operations were performed in his city's Hospital Civil.[42]

In 1875, the *Repertorio Jalisciense de medicina y cirugía* [Jalisco Repertory of medicine and surgery] was edited in the province, which in its fifth volume dealt with cataract extraction and *Consideraciones anátomo-fisiológicas [sic] sobre el aparato lacrimal* [Anatomical/physiological considerations [sic] on the lacrimal apparatus].[48]

Miguel Silva González was born in the Mexican state of Michoacán, in Morelia, in 1857. He died in 1916 in La Havana, Cuba. An orphan from an early age, he was at the point of abandoning his studies due to poverty in his home, even though his father, doctor Miguel Silva Macías, had been governor of his birth state. Thanks to a scholarship, he finished his studies in medicine in Mexico City. He returned to Morelia in 1883 to practice his profession, and he dedicated himself to caring for the needy, and later made two trips to Europe to study.[49]

When, in 1901, the Medical School and General Hospital of Michoacán in Morelia was solemnly inaugurated, Miguel Silva González was appointed professor of Surgery while in the third year of the study programme. In the arsenal allocated to the Hospital, there were complete provisions of instruments for symphysiotomy, amputations, resections, gynaecology, cutting, lithotripsy, ears, nose, throat and tonsils, dermatology, obstetrics, urinary tracts, bladder tumours, enterotomy, trepanning, tracheotomy, perineoplasty, vesicovaginal fistula, laparotomy and oesophagus, among others.[50]

José de Jesús González was born to a poor family in a small village in the Altos de Jalisco. He began his studies in medicine in Mexico City, regularly attending the ophthalmology department in the Hospital de San Andrés, which let him learn the secrets of the specialty.

On 26 March 1897, González applied to take his general exam in Medicine, Surgery and Obstetrics, which took place at 6 pm on 31 May 1897. The presiding panel included Joaquín Vértiz, A. Ruiz Erdozain, M. Zúñiga, Ángel Gaviño and Domingo Orvañanos, and Secundino Sosa as a stand-in.[51]

José de Jesús González worked for 3 years at Dr José Ramos' ophthalmology clinic, in the Hospital de San Andrés. He also worked with Lorenzo Chávez on his ophthalmological operations as a permanent practitioner in the Béistegui hospital.

González returned to León and set up his office on Pacheco street, which is currently called 5 de mayo. He dedicated himself to general medicine, and later to ophthalmology.

On 12 November 1907 he applied to the National School of Medicine to take the exam to receive his specialist degree in ophthalmology, enclosing a list of his original published work on ophthalmology and a letter from Dr José Ramos, referencing José de Jesús González's dedication and achievement.[52] As briefly narrated, this was the start of modern Mexican ophthalmology, which has continued to evolve to this day.

References

1. Lavista R. Las diversas especies de catarata y su tratamiento quirúrgico. Tesis. México: Escuela Nacional de Medicina; 1869.
2. Archivo General de la Nación (en adelante AGN). Justicia e Instrucción Pública, vol. 12, 1833.1834, foja 212,214. Cátedra de oculística.
3. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Apéndice. Legajo 1, exp. 16, fs. 1-3.
4. Fernández del Castillo F, Vértiz JM. Gac Méd Méx. 1977;13-6.
5. Vélez D, Martínez Hinojosa F. Apuntes para la historia de la oftalmología en México, p. 28.
6. Graue E. La oftalmología en México durante la Independencia. Boletín del Hospital Oftalmológico de Nuestra Señora de la Luz. 2007;LIX:12-6.
7. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 43, exp. 4.
8. Ruiz LE. Apuntes históricos de la Escuela Nacional de Medicina. México: Universidad Nacional Autónoma de México; 1963. p. 77-8.
9. Patiño F. El doctor Rafael Lavista (apuntes biográficos), 2.ª parte. La Escuela de Medicina. 1881;III:17-21.
10. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Sin ubicación topográfica.
11. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 126, exp. 1, f. 4.
12. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 126, exp. 1, f. 8.
13. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 126, exp. 1, f. 9.
14. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 134, exp. 21, fs. 10 y 11.
15. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 27, exp. 15.
16. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 136, exp. 4, fs. 1-11.
17. Anales de la Asociación Larrey. 1876;II:32.
18. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 140, exp. 35.
19. Enciclopedia de México. Tomo III. México; 1987. p. 1357.
20. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 288, exp. 11.
21. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 260, exp. 11.
22. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 151, exp. 2, f. 6 y 7.
23. CESU, Archivo Histórico. Fondo Escuela Nacional de Medicina. Caja 34, exp. 2, f. 5-9.
24. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 43, exp. 5, f. 3.
25. Flores y Troncoso F. Historia de la medicina en México. Tomo III. México: Instituto Mexicano del Seguro Social; 1982. p. 528.
26. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 43, exp. 5, f. 8.
27. O'Gorman E. Historia de las divisiones territoriales de México. 10.ª ed. México: Editorial Porrúa; 2007. p. 94.
28. La Escuela de Medicina. 1889;X:205.
29. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 56, exp. 12.
30. Vélez D, Martínez Hinojosa F. Apuntes para la historia de la oftalmología en México. Anales de la Sociedad Mexicana de Oftalmología. 1940;XV.
31. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 38, núm. 11, f. 1.
32. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 38, núm. 11, f. 2.
33. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 38, núm. 11, f. 3.
34. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 38, núm. 11, f. 5.
35. Quiroz JA. Recuerdo del doctor Manuel Uribe y Troncoso. Anales de la Sociedad Mexicana de Oftalmología. 1959;XXXII:6-7.
36. Martínez Hinojosa F. Notas históricas de oftalmología en el cuatricentenario de la Universidad de México. En: IV Centenario de la Universidad de México (1551-1951). Memoria del Congreso Científico Mexicano. VIII. Ciencias Médicas. México: Universidad Nacional Autónoma de México; 1953. p. 145-51.
37. De Gortari E. La ciencia en la historia de México. 3.ª ed. México: Editorial Grijalbo; 1980. p. 329.
38. Márquez M. El Prof. D. Manuel Uribe Troncoso. Homenaje. Anales de la Sociedad Mexicana de Oftalmología. 1959;XXXII:10.
39. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 58, exp. 14.
40. Sánchez Rosales G. Efemérides de mayo. Gaceta de la Facultad de Medicina. 2001;25 de mayo:14.
41. Universidad Nacional Autónoma de México, Fondo Escuela de Medicina y alumnos, leg. 63, exp. 35, f. 4.
42. Alcocer Andalón A. Dr. Antonio F. Alonso. Biobibliografía. Archivos de Historia Potosina. 1976;VIII:126-43.
43. Ocaranza, op. cit., p. 193.
44. Valle RH. La cirugía mexicana del siglo XIX. México: Editorial tipográfica Sag.; 1942. p. LXXXIII.
45. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 32, exp. 8.
46. La Escuela de Medicina. 1895;XIII:275.
47. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 56, exp. 12.
48. Gaceta Médica de México. 1875;X:24.
49. Enciclopedia de México. Tomo XII. México: Secretaría de Educación Pública; 1988. p. 7288.

50. Periódico Oficial del Gobierno del Estado de Michoacán de Ocampo. Tomo IX, número extraordinario. Morelia, martes 16 de julio de 1901.
51. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 56, f. 12.
52. Archivo Histórico de la Facultad de Medicina de la Universidad Nacional Autónoma de México. Fondo Escuela de Medicina y Alumnos. Legajo 56, f. 13.