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Editorial

Professor Evandro de Oliveira, a guiding light in skull base surgery and vascular neurosurgery

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HISTORY

Born in 1945, in Santa Catarina, Professor Evandro de Oliveira is a guiding light in skull base surgery that will always be with us. On February 11, 2021, he succumbed to amyotrophic lateral sclerosis in the city of São Paulo. He was one of the greatest names in neurosurgery worldwide and influenced generations of surgeons, especially in Brazil and Latin America [Figures 1 and 2]. His invaluable influence is due to his dedication and hard work in the laboratory on positioning and bloodless surgery that allowed him to perfect his technique. His shining example was meteoric, and his work illuminated countless surgeons who learned from him and raised the global profile of Brazilian neurosurgery. His precise, step-by-step microsurgical technique, revealed the beauty of brain anatomy and achieved that rare combination of science and art [Figure 3].

Professor Oliveira graduated from Federal University of Santa Catarina in 1969 and became a neurosurgery resident at the School of Medicine, University of the Republic in Montevideo, Uruguay, from 1970 to 1972; a research fellow in Microsurgical Anatomy in the Department of Neurosurgery at the University of Florida, Gainesville, United States, from 1981 to 1982, where he was considered the main pupil of Professor Albert Rhoton Jr.; and received a PhD in Morphofunctional Sciences from the University of São Paulo in 2002.

Born in Santa Catarina, a prosperous state in the south region of Brazil, he was the founder of the São Paulo Institute of Neurological Sciences and an associate professor at the Mayo Clinic College of Medicine and Science in Jacksonville, Florida, United States. For decades, he was the head of the neurosurgery team and responsible for the microsurgical laboratory at the Beneficência Portuguesa Hospital in São Paulo. Later, he was a professor emeritus of neurosurgery at the University of Campinas (Unicamp), one of the most respected universities in the country. An excellent teacher, he gave hundreds of lectures on vascular microneurosurgery, skull base surgery, neuro-oncological surgery, and epilepsy surgery and was the director of various microsurgical anatomy courses all over the world.

Figure 1: Professor Gustavo Isolan, Professor M Gazi Yasargil, Professor Evandro de Oliveira, and Professor Eberval Gadelha Figueiredo, during the World Congress of Neurosurgery in Istanbul, 2017.

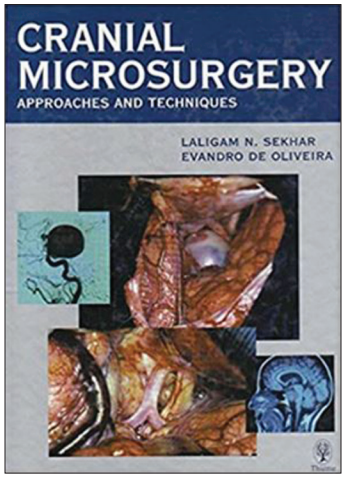

Figure 2: The Book "Cranial Microsurgery – Approaches and Techniques," edited by Professor Laligam N. Sekhar and Professor Evandro de Oliveira, was a milestone in neurosurgery.

PROFESSIONAL MERITS

Professor Evandro de Oliveira authored and coauthored hundreds of scientific articles. Some of the world's most renowned and prominent neurosurgeons of his time, both from Latin America and worldwide, worked with him. Ribas,[10,11,13,16] Tedeschi,[8,9] Rhoton Jr.,[3,6,13,15] Al-Mefty,[7,10] Yasargil, and many others. Some authors of this editorial also had the honor and privilege to publish research guided by him.[1,4,5,7,12,15] His work and legacy will continue to influence and guide neurosurgeons for generations to come.

One article which was particularly important was published in 1998.[2] After extensive experience treating cerebral arteriovenous malformations (impressive 344 cases and more than 85% of good outcome, meaning no neurological deficits), he proposes a modification in the well-established Spetzler-Martin AVM classification,[14] it was observed that a Grade III AVM could be lesions with varying degree of surgical difficulty, such as a large temporal or a deep brainstem AVM. That said, postulates that a Grade III AVM should be subdivided in IIIA and IIIB, the first being Grade III based on its size, and the latter based on its deep venous drainage or location in eloquent areas. He, then, demonstrated, based on his personal case series, that Grade IIIA should be treated with endovascular embolization followed by surgery, and IIIB, except in some selected cases, should be referred to radiosurgery. He also emphasizes that a multidisciplinar specialized team is crucial to a good surgical outcome and that microanatomical laboratory training is paramount for mastering surgical three-dimensional anatomy and developing the surgeon's "fourth dimensional" knowledge, which is the capacity of understanding lesion distorted brain anatomy.

Figure 3: Professor Evandro de Oliveira operating on a patient in Taiwan, 2015.

For his contribution to the excellence of neurosurgery worldwide, the American Association of Neurological Surgeons named a symposium in his honor that was held in April 2019 in San Diego, California, United States – the Evandro de Oliveira Symposium.

Professionally, he considered his greatest legacy the creation of the Microsurgical Laboratory at the Beneficência Portuguesa Hospital in São Paulo. It became the most active neurosurgery training center in Latin America, where more than 5000 professionals, including neurosurgeons and otolaryngologists, have come to attend a variety of courses on microsurgical anatomy [Figures 4-8].

Even before the opening of the microsurgery laboratory, Professor Evandro created and directed continuing education courses since 1989 at the Neurological Institute

of São Paulo, with the inaugural seminar "Saccular Intracranial Aneurysms." The opening of the Microsurgical Laboratory, in 1993, was the first of its kind in the city of São Paulo. It began with five workstations, each consisting of a workbench with a microscope and lighting, and a workbench for the instructor, which thus enabled true hands-on education. Since 1995, continuing education courses have welcomed some of the greatest international figures in the development of neurosurgery, its research, and education.

From 1993 to the present date, the following courses have been given annually for the training and improvement of both neurosurgeons and other specialists:

- Anatomy of the cerebral ventricles, sulci, gyri, white matter, and techniques for AVMs and gliomas
- High-flow extracranial-to-intracranial bypass microsurgery techniques
- Microsurgical anatomy of the temporal bone and transtemporal approaches to the skull base
- Microsurgical anatomy and approaches to the sellar and parasellar region/anatomy and endoscopic surgery of the sellar and clival region
- Peripheral nerve surgery
- Laboratory training with Midas Rex
- Vascular hands-on seminar: craniotomy with artificial skull and Sylvian fissure opening simulation, clipping aneurysms, and vascular anastomoses with placenta
- Sulci, gyri, and ventricles
- White matter dissection using the Klinger technique
- Brainstem and cerebellum.

HOW HE STAYS IN OUR MEMORY

According to Professor Evandro de Oliveira, "the Microsurgical Laboratory has a worldwide reputation (being one of the most respected in the world), providing mainly to Brazilians and other Latin Americans, as well as neurosurgeons from various other parts of the

Figure 5: Professor Evandro de Oliveira, Professor Majid Samii, Professor Helder Tedeschi, and Professor Mário Otávio Lorenzo (São Paulo).

Figure 6: Professor Evandro de Olivera and Professor Ossama Al-Mefty in the 90s (São Paulo).

Figure 4: From left to right: Professor Paulo Andrade de Mello, Professor Carlos Alberto Telles Ribeiro, Professor Albert Rhoton Jr., and Professor Evandro de Oliveira at the Beneficencia Portuguesa Microsurgical Laboratory in São Paulo.

Figure 7: Professor Ali Krisht, Professor Evandro de Oliveira, and Professor Antonio Bernardo.

Table 1: Former fellows of Professor Evandro de Oliveira who spent at least 1 year in the microsurgery laboratory.

Abranam Avaro Ignácio Campero (Argentina)	Gustavo Rassier Isolan (Brazil)	Mauro Mendonça Cordeiro (Brazil)
Adalton Arcanjo dos Santos Jr (Brazil)	Helder Tedeschi (Brazil)	Maurus Marques de Almeida Holanda (Brazil)
Aguinaldo Pereira Catanoce (Brazil)	Hugo Leonardo Dória Netto (Brazil)	Mayrellis Llerena Bernal (Cuba)
Airton Batista de Araújo Jr. (Brazil)	Ismael Florencino Ramirez (Venezuela)	Michio Ono (Japan)
Alberto Carlos Capel Cardoso (Brazil)	Issa All Muftah Lahirishi (Libya)	Nigel John Suttner (United Kingdom)
Alexandre Melluzzi (Brazi)	Jaime Alejandro Ramos Giron (Colombia)	Pablo Augusto Rubino (Argentina)
André Kiss (Brazil)	Jair Raso (Brazil)	Paulo Thadeu Brainer Queiroz Lima (Brazil)
André Simis (Brazil)	Javier Martinez (Argentina)	Rafael do Rego Barros Bittencourt Cunha (Brazil)
Angelo Musumeci (Itália)	Javier Valdéz Garcia (México)	Ramon Euclides Alvarez Villão (Panama)
Antonio Cesar de Melo Mussi (Brazil)	João Paulo de Vasconcelos Mattos (Brazil)	Ramón Montes Vaca (Mexico)
Antonio Luiz Carone (Brazil)	Jorge Arturo Santos Franco (Brazil)	Raphael V. Alves (Brazil)
Antonio Moura Diniz Lara (Brazil)	Jorge Luís Garcia Ferrabone (Brazil)	Rene Cecilio Filho (Brazil)
Áurea Elisabeth Simões de Oliveira (Brazil)	Jorge Marcelo Mura Castro (Chile)	Ricardo José Paixão Araujo (Brazil)
Aziz Rassi Neto (Brazil)	José Alvaro Bastos Pinheiro (Brazil)	Richard Gonzalo Párraga Choque (Bolivia)
Bruno Carmello Rocha (Brazil)	José Maria Campos Filho (Brazil)	Roberto Correa Mendonça (Brazil)
Bruno Rocha Lobo (Brazil)	Juan Antonio Castro Flores (Bolivia)	Rodolfo José Recalde (Argentina)
Carlos A. Solis Vergara (Panamá)	Julio Solarte Reina (Chile)	Rodrigo Ferrari Naufal (Brazil)
Celso Fretes Ramirez (Paraguay)	Konsur Ragavendra Sujay Rao (India)	Rogério Ivan Ortiz Velasques (Mexico)
Cesar de Paula Lucas (Brazil)	Koshiro Nishicuni (Japan)	Rogéno Turolo da Siva (Brazi)
Daniel Wilson Borovsky (Uruguay)	Leonardo Christiaan Welling (Brazil)	Rolando Spagnuolo (Uruguay)
Eduardo Roberto Seoane (Argertina)	Lucas Loss Possatti (Brazil)	Rubén Dario Batista Quintero (Panama)
Eduardo Salas Lopez (Argentina)	Luis Fernando Martinez Esparza (Colombia)	Sergio Branco Soares (Brazil)
Elianne dos Santos Rubio (Netherlands)	Luiz Adriano Esteves (Brazel)	Sergio Leonardo Viana Fernandes (Brazil)
Eric Homero Albuquerque Paschoal (Brazil)	Luiz Alberto Lengua (Peru)	Sergio Listlk (Brazil)
Fabio Santana Carvalho (Brazil)	Luiz Fernardo Haikel Junior (Brazil)	Sérgio Tadeu Fernandes (Brazil)
Fabricio Carrijo Rodrigues (Brazil)	Luiz Tarciso da Gama (Brazil)	Shinji Nagata (Japan)
Feres Eduardo Aparecido Chaddad Neto (Brazil)	Mariano Ebram Fiore (Brazil)	Silvio Marcelo S. Fernandes (Brazil)
Flavio Ramalho Romero (Brazil)	Mario Alberto Santana Machado Filho (Brazil)	Simone Cristina Zanine (Brazil)
Francisco Carlos Andrade Jr. (Brazil)	Mario Luiz Marques - Voluntário (Brazil)	Ventura E. Jauregui Felix (Mexico)
Francisco Gonzalez Vicuña (Chile)	Mateus Reghin Neto (Brazil)	Vicent Quills (Spain)
Guilherme Augusto Rodrigues do Prado (Brazil)	Matteo Baccanelli (Argentina)	Wen Hung Tzu (Brazil)
Gustavo Adolfo Calderon Rodriguez (Colombia)	Mauro Augusto Tostes Ferreira (Brazil)	

Figure 8: Last microsurgical anatomy course with Professor Evandro de Oliveira in 2020, São Paulo. From left to right: Marina Veira, Vanessa Milanese Holanda, Vicent Quilis, Mateus Reghin Neto, Professor Evandro de Oliveira, Andréia Limberg, and Professor Wen Hung Tzu.

world who have also visited, a unique opportunity for learning, training, and development by participating in the continuing education courses offered by the Institute of Neurological Sciences at its facilities." The principal mission of these hands-on courses is to disseminate throughout Brazil skull base surgery and vascular microsurgery skills using a didactic and rational approach that is based on a laboratory-acquired understanding of surgical anatomy. Professor Evandro de Oliveira had a peculiar way of seeing the world and tolerated nothing less than perfection. He had a unique and serious demeanor.

Among the hundreds of fellows who accompanied Professor Evandro de Oliveira, [Table 1] lists those who undertook research or clinical fellowships for a period of at least 1 year. Hundreds of other professionals undertook shorter internships and were able to observe and learn the philosophy of this great master.

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