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Obituary

MG Yasargil: A Giant Swiss Clinical Neuroscientist (1925–2025)

Karl-Olof Lövblad ^{1,*} , Karl Schaller ¹ , Raphael Guzman ² , Claudio Bassetti ³ and Luca Regli ⁴

¹ Division of Neuroradiology, Geneva University Hospital, 1205 Geneva, Switzerland

² Division of Neurosurgery, Basel University Hospital, 4031 Basel, Switzerland

³ Neurology Department, Inselspital, Medical Faculty, University of Bern, 3010 Bern, Switzerland

⁴ Department of Neurosurgery, Clinical Neuroscience Center, University Hospital and University of Zurich, 8091 Zurich, Switzerland

* Correspondence: karl-olof.lovblad@hug.ch; Tel.: +41-223727033

Abstract

The Swiss Society of Clinical Neuro-Societies mourns the loss of the former director of the Clinic of Neurosurgery at the University Hospital of Zurich Switzerland. He has pioneered microneurosurgery for lesions of the central nervous system and has had an enormous impact not just on the development of neurosurgery but also on neighboring specialties of clinical neuroscience such as neurology and neuroradiology. He is considered one of the major innovators in his field and his impact is still felt in today's practice, not only in neurosurgery but also in advanced techniques for the exploration of the central nervous system such as angiography.

Keywords: neurosurgery; neurosciences; history of neurosurgery; Swiss physician; Switzerland; Zurich; Zurich University Hospital; aneurysms; microneurosurgery; arteriovenous malformations; neuroradiology



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1. Introduction

The Swiss Federation of Clinical Neuro-Societies (SFNCS) has the profound regret to announce the passing of Professor Dr M Gazi Yasargil (1925–2025) (Figure 1). He was in his 100th year and a symposium in his honor will be held by the Neurosurgery Clinic in Zurich on 4 July 2025.

Gazi Yasargil shaped an entire generation of neurosurgeons—and many of their students as well. During the last quarter of the 20th century, he transformed Zurich into the European hotbed of global neurosurgery.

He was monolithic—but also exceptionally hard-working and creative. He held firm ideas about the principles of anatomy, physiology, and pathophysiology, as well as the origins of neurovascular and oncological diseases of the brain. He never hesitated to adopt ideas from others and was always willing to acknowledge their contributions, as long as their concepts convinced him. This intellectual generosity reflected his universal worldview and his scientific curiosity, which extended far beyond the neurosciences.

He was born in Turkey in 1925 and moved to Germany to study medicine before finally going to Switzerland to work at what at the time was the Kantonsspital (now USZ) [1]. He would join the Kantonsspital after two years in surgery and medicine. He was trained by the chief of neurosurgery in Zurich, Prof Hugo Krayenbühl [2], who was the founder of modern Swiss neurosurgery. He was first a resident, then an attending physician, before becoming chief and head of the division upon the retirement of Professor Krayenbühl. Finally, Prof Krayenbühl had already established the neurosurgery clinic nationally and

internationally, but it is under the direction of Prof MG Yasargil that the clinic would become clearly one of the leading neurosurgical centers in the world. Under the impulsion of Prof H Krayenbühl he would study microsurgery in the USA with Prof RMP Donaghy [3,4]. He succeeded Krayenbühl in 1973 and retired after 20 years in 1993, his successor being Prof Yashuhiro Yonekawa. The position is held today by Prof Luca Regli.



Figure 1. Prof MG Yasargil in his home during an interview, explaining neuroanatomy and neurosurgery with a brain model in his hands (Image courtesy of Diane Yasargil and Daniel Pünter).

2. Initial Work

For many years he worked on vascular processes of the central nervous system under the guidance of Krayenbühl [5–8] (Figure 2).



Figure 2. The office of the direction of neuroradiology in 1987 with the door to MG Yasargil's office and a portrait of Professor Hugo Krayenbühl, his master, beside it. Photo: Private collection of Prof Lövblad, taken by himself.

Following his collaboration with Professor Donaghy [4], he developed microneurosurgery which would be the method and specialty that established him worldwide. He would thus perform the world's first superficial temporal artery-to-middle cerebral artery (STA-MCA) bypass, using microsurgical technology. In this area he made many technical developments such as the Zeiss OPMI surgical microscope [9–12], the Yasargil aneurysm clip, and the Leila retractor [13], among others. Locally he would additionally establish the microsurgery lab, where many local and international trainees would perform bypass operations on rats.

Contributions to the Neurosciences in Switzerland and Worldwide

(A). Neurosurgery:

After studying in depth cerebrovascular anatomy and physiology [9,14–16] he would concentrate on the surgery of cerebrovascular diseases: his career was marked initially by the development of EC-IC bypass techniques for cerebrovascular techniques, a technique that has found applications for until today when revascularization is needed, and one that he would transfer to his pupil Prof HG Imhof. A symposium to mark the 50th anniversary of the technique was held in Zurich in January 2020. However, it would be with the development of innovative surgical techniques involving microscopic work as well as new tools and clips that he would revolutionize the world of aneurysm treatment. He developed vascular neurosurgery encompassing aneurysms and AVMs. His first major contribution would be the monograph «Microsurgery applied to neurosurgery» [17], which years later would be followed up by his magnum opus, the multi-volume “Microneurosurgery”, which resumed in great detail the anatomy and surgical approaches he would use for intracranial processes [18]. Based on his reputation as a skilled surgeon, his clinic attracted visitors from all over the world. Many would wonder at his extremely quick operating technique while also being surprised by his temper and demand for total silence in the operating room. He proposed and popularized minimally invasive approaches such as the cisternal and pterional routes, enabling precise resection of aneurysms, arteriovenous malformations, and skull base tumors while minimizing damage to normal brain tissue. He additionally invented or refined essential tools including the floating microscope stand, the Yasargil aneurysm clip, the Leyla retractor system, microsurgical sutures, and ergonomically optimized surgical chairs—all of which remain standard equipment in neurosurgical operating rooms worldwide.

Stereotaxy: early on in his aim to treat cerebrovascular diseases he would develop stereotactic approaches that would later be applied to movement disorders; he introduced these techniques in Zurich and would pass them on to Professor Jean Siegfried who focused on the surgical treatment of Parkinsonism [19–21].

All this shows that Prof Yasargil's contributions were not just technical; they were conceptually revolutionary—as seen in his influence on epilepsy surgery, the treatment of (para)limbic gliomas, and the management of craniopharyngiomas.

Equally important as his foundational contributions to microsurgery was his inspirational and multiplying effect on hundreds of young and experienced neurosurgeons. Students, residents, and professors from all over the world flocked to the University Hospital Zurich. He welcomed us generously and allowed us to train in the microsurgical lab—excellently and rigorously run by Rosemarie Frick—where we practiced suturing and micro-anastomoses.

What was remarkable was the atmosphere in the operating room: regardless of one's career stage, everyone sat quietly on the benches as equals. This had a profound equalizing and egalitarian effect: for our time in Zurich, we were all observers and learners. It fostered a cultural and intellectual exchange that laid the foundation for lifelong friendships and

professional collaborations across continents and generations—relationships that continue well into the 21st century.

(B). Contributions to Neuroanatomy:

Early on, he recognized that neurosurgical practice is inspired by visual understanding—and that traditional, well-meaning anatomical and surgical sketches did little to foster true comprehension. In Peter Roth, he found a kindred spirit and illustrator capable of vividly depicting the anatomical foundations of microsurgical technique—precisely in the way Gazi Yasargil envisioned them. Roth's illustrations not only captured the essence of microsurgical anatomy but also brilliantly complemented the principles of cisternal and intra-arachnoid vascular surgery, as well as the treatment of extrinsic tumors and Yasargil's own theories on the systemic and fiber tract-dependent growth of intrinsic brain tumors. The central product of this collaboration was the six-volume series "Microneurosurgery", which, both conceptually and visually, still stands as a monumental achievement in neurosurgical literature—even 30 to 40 years after its initial publication.

(C). Contributions to Neurology:

Epilepsy surgery was initially a specialty performed almost exclusively in Zurich [22–25], and based on this Yasargil would use microsurgical techniques to develop the selective hippocampectomy [26]. To do so, he would motivate his colleagues in the Neurology Division of the Kantonsspital Zürich, such as Professor HG Wieser, to improve EEG techniques for localization of seizures.

(D). Contributions to Neuroradiology:

Initially he would devote his efforts to the study of brain vascularization which would lead to his pioneering monograph "die Vertebralisangiographie" [16]. Later on, he would expand the ultimate textbook on cerebral angiography, initially written by Prof H Krayenbühl and Dr H Richter, later rewritten by Prof Peter Huber of Bern, and which remains a monograph on angiography par excellence [27]. This work established the basis for angiographic excellence and was based on his initial knowledge in angiography [8]. Another of Prof Gazi Yasargil's visionary collaborators was his friend Prof Anton Valavanis, the head of the Division of Neuroradiology at the USZ, who passed away in 2023. Together—with Roth's illustrations—they profoundly shaped the understanding and approach of many current neurovascular surgeons and interventional neuroradiologists. He would therefore motivate Prof Anton Valavanis and his team to develop excellence in clinical neuroradiology, which allowed the creation of the first independent division of neuroradiology in Switzerland. Based upon the pioneering works of Prof MG Yasargil, Prof Anton Valavanis would put an emphasis on the endovascular treatment of vascular malformations, initially as an adjunct to surgery [28]. This would also have an impact on his work with Prof Ugo Fisch on skull base lesions.

3. Late Career and Recognition

Prof MG Yasargil retired in 1993 from the USZ and would go on to work in Little Rock, Arkansas, for many years both operating and contributing to surgical knowledge [29], before moving to work in Istanbul and finally retiring in Zurich.

He was president of the Swiss Society of Neurosurgery between 1973 and 1975.

In 1989 he was named the second honorary member of the Swiss Society of Neuroradiology in light of his own contributions as well as for his support of the development of neuroradiology as a specialty in Zürich and in Switzerland [30].

In 2014 he was also nominated honorary member of the Swiss Society of Neurosurgery [31] for his massive support to the development and growth of neuroradiology in Switzerland.

He was also nominated *Neurosurgery's* man of the century in 1999 [32].

He has left an immense legacy not just in neurosurgery but also in other neuro fields, such as neuroradiology and neurology.

He trained neurosurgeons from all continents at his centers in Zurich and Little Rock, forming the globally influential “Yasargil School”.

4. Discussion

Professor Yasargil's ability to attract and inspire both young and experienced students and colleagues is a shining example of how academic medicine—and neurosurgery in particular—can advance: through forums that welcome curiosity and new ideas from all, and that give the benefit of the doubt to those willing to pursue these ideas with dedication, hard work, and intergenerational connection.

5. Conclusions

Professor Gazi Yasargil lived nearly a hundred years. What a life in full—even beyond neurosurgery! And as Professor Wilder Penfield from Montreal wrote in 1972 about his master Prof H Krayenbühl in his paper “all hail to a master neurosurgeon”, we all “pay our tribute to excellence in the career of the Master Neurosurgeon of Switzerland” [33].

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Abbreviations

The following abbreviations are used in this manuscript:

USZ	Universitätsspital Zürich
SFCNS	Swiss Federations of Clinical Neurosciences

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