

20 years of microsurgery in Greece

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The beginning of microsurgery in Greece is rooted at Duke University Medical Center in Durham, NC, where between 1970 and 1974 I was a Clinical and Research Fellow under Dr. James Urbaniak at the Department of Surgery, Division of Orthopaedic Surgery at Duke University Medical Center. It is there that I first learned the three "Ms" of microsurgery, the operating microscope, micro-instruments and micro-sutures, for the suturing of small vessels. At that time and even today, Microsurgery has a solid foundation in the laboratory where surgeons have the opportunity to practice microsurgical techniques and solve problems on experimental models. While at Duke, I had the opportunity to work in a laboratory which was located in the VA hospital. There, experimental models included the femoral and brachial arteries of cats and rabbits, the aorta of rats and the radius and radial artery of dogs and reflected a continuous research effort related to the evaluation of various methods for suturing small vessels and to the establishment of a vascularized bone graft model. As a result of this experimental work, two papers were published (Adelaar et al. 1974, Urbaniak et al. 1975). In addition, a number of papers were presented at various meetings and seminars (Soucacos et al. 1975a, Soucacos et al. 1975b, Urbaniak et al. 1977).

It was in 1975 that I returned to Greece to organize a microsurgery-replantation team. This was tedious and difficult, since on the one hand, the instruments and microsurgical equipment were expensive, and on the other hand, there was only a single microscope which was usually used by the ophthalmologists and neurosurgeons. The previous background regarding replantation in Greece included several attempts from various centers (Hippocraton Hospital, Diamandis Cassioumis; Laiko Hospital, Panayotis Balas and Anastasios Giannikas; "KAT" Hospital, Athanasios Trabaklos). All of these attempts involved conventional techniques without the use of magnification by a "traditional" replantation team which consisted of a vascular surgeon for the vascular work and an ortho-

pedic surgeon for bone, tendon and nerve work. The first successful replantation of a completely amputated arm was done on February 18, 1967 at Laiko Hospital (at that time the King Paul Hospital) by Panayotis Balas, a vascular surgeon who is currently Professor of Surgery at the University of Athens Medical School and who is considered the father of vascular surgery in Greece, and Anastasios Giannikas, an orthopedic surgeon who was one of the pioneers of hand surgery in Greece. This case involved a 21-year-old female factory worker who had completely amputated her right arm (Balas et al. 1970).

The first successful replantation of a completely amputated finger in Greece was achieved on July 3, 1979. Earlier revascularization attempts had been made in Greece and the first replantation of a thumb with an incomplete nonviable amputation at the base of the first phalanx was accomplished as early as 1975. In this case one digital artery and one vein were anastomosed with a successful outcome (Figure 1).

In addition to the effort to organize a microsurgery/replantation team as soon as I returned to Greece, I was also involved in organizing round tables and lectures in an attempt to inform residents and physicians of what microsurgery was all about. In 1976, I succeeded in replanting an incomplete nonviable amputation of the distal third of the forearm using suture material and instruments which were donated to me by Dr. James Urbaniak from Duke. However, because at that time there was still a lack of knowledge concerning microsurgery, a lawsuit was placed against me by a vascular surgeon who insisted that since I wasn't a vascular surgeon, I didn't have the right to do the vascular work in this case. Fortunately, the replantation was successful and I did not have to go to trial. During this difficult time, I had the full support of the Professor and Chairman of the Orthopaedic Department of the University of Athens, George Hartofilakidis. I am not sure if I would have been able to successfully achieve anything at that

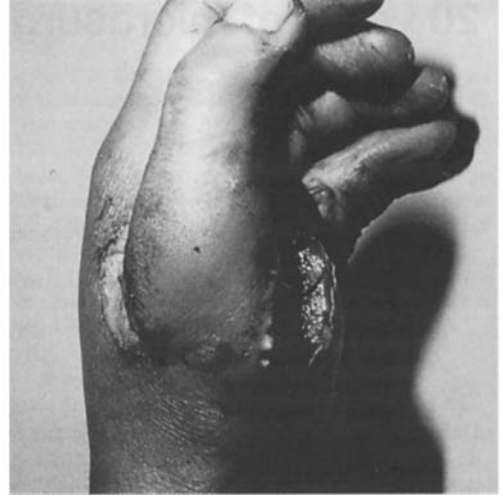


Figure 1. Palmar and lateral views taken immediately post-operatively of an incomplete nonviable amputation of the left thumb on a 20-year-old laborer. Only 1 artery and vein were anastomosed and the flexor pollicis longus was repaired. The skin was left open to avoid adduction and flexion contracture. Note that a small islet of skin on the dorso-medial aspect of the thumb which was left intact, was the only tissue connecting the distal part to the stump.



Palmar and lateral views of the revascularized thumb. Secondary wound healing with satisfactory interphalangeal joint motion were observed.

time without the moral support of this man, who had the idiosyncrasy of standing by and supporting young people who were trying hard to establish something. For this and a myriad of other reasons he is undoubtedly and fully justifiably recognized as the father of modern orthopedics in Greece. After these early formative years, there were several triumphs and achievements.

In 1979, I performed the first successful digit replantation in Greece with the help of an orthopedic resident, Stathis Anastasiou, who later became one of my closest colleagues and friends. It was the little finger of an 18-year-old girl who had sustained complete amputation of all digits except the thumb of the left hand. With the exception of the little finger, the digits were not replantable since they had been

severely crushed (Soucacos and Anastasiou, 1994). Shortly after that, the first successful thumb replantation (Soucacos et al. 1994) was performed by the members of a replantation team which besides myself and Stathis Anastasiou, also included Alexandros Beris, a resident at that time who later became and still is one of the most prominent and distinguished microsurgions in Greece and Assistant Professor of the Orthopaedic Department at the University of Ioannina Medical School. This same replantation team also performed the first vascularized free-fibular graft in 1980 on a patient who had an open fracture type IIIb with extensive skin and bone loss (Soucacos et al. 1989).

In June 1980, I was appointed Chief of the Department of Orthopaedic Surgery at a newly formed Medical School at the University of Ioannina in Greece. Shortly after I was appointed to my new position, most of the members of the University of Athens replantation team (Stathis Anastasiou, Alexandros Beris and Alexandros Touliatos) also moved to Ioannina. There we all started struggling to equip our department with the essential operating microscope, micro-instruments and micro-sutures. However, my appointment took place in June and until the rest of the team could come up to Ioannina, I was commuting back and forth to Athens. There were times, when Dr. Savas Sourmelis, a young resident at that time, would call me from Athens about a patient, and by the time I would get on the bus for the 6 hour ride back down to Athens, the patient was being prepared for the several long hours of surgery which followed once I arrived. Although initially there was a general climate of reservedness and incredulity from most of our colleagues, not very long after we moved to Ioannina, we succeeded in doing several replantations on patients in Ioannina. This ultimately gave us national recognition, first because of the actual cases, and second since we were able to do these in a newly established medical school which was still developing. This achievement also provided us with patient referrals from all over the country. In the following years, I supported members of our group (Aristides Zoubos, Alexandros Beris, Konstantinos Malizos) to have further training in the Department of Orthopaedic Surgery at Duke University Medical Center, where we have created very tight scientific bonds. Thanks to Dr. James Urbaniak, whom I recognize as being my mentor in orthopedics and microsurgery, these surgeons had the opportunity for further training at an institution with the caliber of Duke University's. In turn, upon their return to Greece, these surgeons were able to contribute greatly to the development and evolution of microsurgery, not only

in my department, but also in all of Greece.

In 1984, we started organizing a microsurgery seminar with a workshop in order to educate young orthopedic and plastic surgeons, in the techniques of microsurgery. 35 surgeons attended the very first microsurgery seminar for which Dr. James Urbaniak was invited as a guest speaker. In the years which have elapsed, over 350 young residents, mostly from orthopedics and plastic surgery, have attended these seminars which have become very popular in Greece. I recruited various orthopedic and plastic surgeons who had trained in microsurgery either in Greece or abroad to form a core group which acted as the faculty for these seminars. (Faculty members have included: Aristides Zoubos, Catherine Vlastou, Domna Kalomiri, Nicolas Daoutis, Savas Sourmelis, Demitris Efstathopoulos, Nicolas Gerostathopoulos, John Ioannovich and Konstatinos Stamatopoulos.) In addition, we also have had internationally distinguished scientists, including Julia Terzis, Scot Earle, Guy Foucher, Alain Gilbert, Giorgio Brunelli, Hanno Millesi, Milan Stefanovits, Simo Vilkki, James Nunley and Richard Goldner, serve as members of an international faculty for these seminars.

In 1990, the Hellenic Society of Reconstructive Microsurgery was founded. The founding members were all of the microsurgions who had pioneered microsurgery in Greece including: E. Anastasiou, A. Beris, K. Vlastou, A. Zoubos, N. Daoutis, D. Kalomiri, K. Stamatopoulos and myself, the founding president of the Society. December 1991, the first inaugural meeting of the Hellenic Society of Reconstructive Microsurgery was held in Metsovo, Greece. In 1992, the Hellenic Society of Reconstructive Microsurgery along with the Hellenic Association of Orthopaedic Surgery and Traumatology acquired offices in a new medical building in Athens, thanks to the generous contribution from some of the founding members. Greece is also a founding member of the European Foundation of Microsurgical Societies. The Eleventh Congress of the International Microsurgery Society was held in June, 1992 in Rhodes, Greece. This Congress was made possible by the efforts of Dr. Julia Terzis who was president of the IMS at that time, and who has had a profound impact on the development of microsurgery in Greece (Terzis 1993). I along with my colleagues of the Greek Microsurgical Society served as organizers and hosts for this meeting, for which I gave the inaugural address in English, using primarily words of Greek origin (Soucacos 1993).

Currently, in Greece, three major microsurgical centers exist. One in Ioannina at the Department of Orthopaedic Surgery, Ioannina University Medical

School and two in Athens; one at the Department of Hand Surgery and Microsurgery of the "KAT" Hospital in Kifissia and the other at the Department of Plastic Surgery and Microsurgery in the General Hospital of Athens. These three units have performed during the past 2 decades over 1000 replantation and revascularization procedures of digits, hands and major limbs. In addition, a vast number of reconstructive procedures have been performed in these centers, including free skin flaps, toe-to-hand transfers, nerve grafts, vascularized fibular grafts, etc.

Since 1990, two issues of *Microsurgery* (Soucacos 1992, Soucacos 1994) have devoted a section of *Frontiers in Microsurgery* to the history and evolution of microsurgery in Greece. I was a Section Editor in both issues, of one for which Dr. John Gould, the Editor-in-Chief and an adamant supporter of microsurgery in Greece, wrote a very flattering editorial on my behalf (Gould 1992). In addition, I had the opportunity to be a Guest Editor for two International Symposia in International Angiology and Clinical Orthopaedics and Related Research in 1995 on the Advances in Microsurgery for which in both the Greek representation was significant. Now, after reviewing the trials and tribulations of the development of microsurgery in Greece, we find ourselves in the dawn of the third decade as acknowledged by two Special Editions on Microsurgery in Greece in Greek Orthopaedic Journals which were published to commemorate the 10th anniversary of the Hellenic Microsurgery Seminars (Soucacos and Anastasiou 1994, Soucacos et al 1994). We remain devoted to the goal of educating more young surgeons and to the expansion of microsurgery with the formation of new centers which may better fulfill the needs of patients who have had the trauma of mutilating injuries of their upper and lower extremities.

Today Greek microsurgeons are able to successfully execute not only replantation in trauma cases, but use microsurgical procedures to solve a wide variety of both trauma and reconstructive state of the art problems. These include free flap transfers, vascularized bone grafts, nerve grafts, toe to hand transfers among others.

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