

# A Glance at the History of Angiology in Central Europe\*

Puchmayer V.

*Czech Angiological Society, Prague, Czech Republic*

## SUMMARY

The question is: What is angiology? It is the branch of medical science studying blood and lymph vessels and the disorders that affect them. With the development of techniques, diagnostic and therapeutic methods and with the increasing morbidity and mortality due to vascular diseases, over recent decades it has become an important speciality of medicine.

**Key words:** history of angiology.

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The very first references to angiology go back as far as the time before Christ (Tab. 1).

In the centuries after Christ, and especially in the Renaissance, the understanding of vessels made important progress (Tab. 2).

By the 19th century some vascular diseases were already being described (Tab. 3).

The first specific diagnostic steps were executed as early as the 19th century. In the 20th century, a whole range of diagnostic methods was developed (Tab. 4).

There was also significant development of therapeutic procedures in the 20th century (Tab. 5).

Nowadays we have 3 lumen opening techniques: reconstruction, PTA, and thrombolysis.

Nevertheless, conservative therapy, especially walking training, is indicated in most cases of 2<sup>nd</sup> stage arterial occlusive disease.

During the first 40 years of the 20th century, the first textbooks on vascular diseases originated, based on the progressive knowledge about vessels and their disorders (Tab. 6).

In the 1930s and 1940s, individual internists and surgeons were interested in different vascular diseases as such, but not in the whole field of knowledge. The term "clinical angiology" came into existence only after World War II and included diseases of limbs, arteries and veins, then lymph vessels and later also renal and large extra-cerebral arteries. There were the surgeons who took over in 1940s, thanks to Lerich's description of sympatotomy. Internist angiology began to develop only in the 1950s, thanks to more

sophisticated diagnostic and therapeutic procedures and better cooperation with surgeons. Angiology departments grew not only at surgery clinics but mainly at internist clinics, established by excellent vascular experts such as Max Ratschow in Halle, A. Kappert in

**Tab. 2.** First references of vessels and vascular disorders (A. D.)

**Galen** (129-200) – *Ars medica: De curandi ratione per venae sectionem*  
**16<sup>th</sup> Century** – description of spontaneous gangrene autopsy: occlusions of vessels  
**Jessenius Johannes** (1566-1623) Prague – 1<sup>st</sup> open autopsy (1600)  
**Fabricius Hildanus** (Wilhelm Fabry) (1533 – 1619)  
 (1) description of veins and heart valves  
 (2) on hot and cold gangrene (1603)  
**Harvey William** (1578 – 1657) – *Excitatio anatomica de motu cordis et sanguinis in animalibus* (1628)  
**Malpighi Marcello** (1628 – 1694) – description of capillaries (1661)

**Tab. 3.** Description of some vascular diseases

**1831 J. F. Bouley** – intermittent limping in horses as a consequence of secondary thrombi of aorta and its branches caused by larvae  
**1858 J. M. Charcot**  
 (1) posttraumatic obliteration of common iliac artery  
 (2) intermittent limping as an analogy in horses  
**1862 M. Raynaud**  
 acral necrosis on the base of neurogen vasoconstriction in free vessels  
**1866 A. Kussmaul, R. Maier** – periarteriitis nodosa  
**1878 A. von Winiwarter** – endarteritis and endophlebitis with gangrene (in the amputated limb of a 57-year-old man)  
**1898 W. Erb** – on intermittent limping and other nervous disorders resulting from vascular diseases  
**1908 Leo Buerger** – thrombangiitis (endangiitis) obliterans – m. Buergeri (clinically)

**Tab. 1.** First references of vessels and vascular disorders (B. C.)

**Heracleitos of Ephesus** (500 y. B.C.) – philosophises about potential vascular system  
**Hippocrates** (460 - 377 B.C.) – differentiation between veins and arteries and vessels with "white blood"  
**Thukydidies** (460-396 B. C.) – description of a disease very similar to Buerger's disease during the Peloponnese War of Athens against Sparta, 431 – 405 B.C.  
**Aristotle** (384 – 322 B.C.) – description of vessels, including those with "white blood"  
**Herophilos** (300 – 250 B.C.) – description of arteries and pulmonary vessels

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**Tab. 4.** Development of diagnostic procedures

**1748 Morgagni** (Padua) – palpation of peripheral pulses  
**1837 Piorry** (Paris) "Diagnostics and semiotics" – palpation of pulses of lower extremities in typical localization, missing of pulse = local obstruction  
**1870 Kolb** (Zürich) – auscultation in the inguine  
**1923-4 Sicard, Forestier** (Paris)  
**Berberich, Hirsch** (Frankfurt/M.)  
**Brooks** (St. Louis)  
 1<sup>st</sup> attempts of angiography with natriumiodid, strontiumbromid and lipiodol  
**1927 R. Dos Santos** (Lisboa) – arteriography of aorta and peripheral arteries of lower limbs  
**1928 Prusík, Volicer** (Prague) – arteriography of lower limbs  
**1931 Moniz** (Paris) – arteriography of cerebral arteries (thorotrast)  
**1950s** standard methods of arteriography with modern contrast substances  
**1925 Prusík** (Prague) – oscillotometry  
**1949 Gesenius, Keller** (Berlin) - oscillography  
**1966 Strandness** (USA) – Doppler's ultrasonography  
**1974 Barber** (USA) - duplex ultrasonography  
**1954 Fontaine** (Strassbourg) – gangrene = IV<sup>th</sup> stage of obliterative diseases

**Tab. 5.** Development of therapeutic procedures

**1898 W. Erb** (Heidelberg) – walking training in intermittent limping  
**1912 A. Carrel** – Nobel Prize for founding of experimental vascular surgery  
**1917 R. Leriche** (Paris) – 1<sup>st</sup> attempts of occluded artery resection and exclusion of autonomous nervous system, later gangliectomy  
**1943 R. Leriche** (Paris) – sympathectomy in intermittent claudication  
**1946 J. Dos Santos** (Lisboa) – thrombendarterectomy  
**1947 R. Reboul** (Paris) – open elimination of arterial occlusion (over 17 cm long)  
**1949 J. Kunlin** (Paris) – arterial bypass with the vein graft  
**1950 M. Ratschow** (Halle) – systematic walking training in intermittent claudication  
**1964 C. T. Dotter, M. P. Judkins** (Oregon) – arterial dilatation with catheters (PTA)  
**1965 H. Senning**  
 (1) coronary thrombendarterectomy  
 (2) combined surgical procedures in skin defects  
**1966 H. Hess** (Munich) – systemic thrombolysis in acute arterial occlusions  
**1967–8 H. Hess** (Munich)  
**W. Schoop, M. Martin, E. Zeitler** (Engelskirchen)  
**H. Ehringer** (Wien)  
**A. Alexander** (Hannover)  
 systemic thrombolyses in subacute and chronic artery occlusions  
**1970s** – extraanatomic bypasses, femoro-crural bypasses, autologous vein bypasses (Lexer)  
**1974 A. Grüntzig** (Zürich) – balloon angioplasty of peripheral arteries (PTA)  
**1978 A. Grüntzig** (Zürich, Atlanta)  
 (1) local thrombolysis together with PTA  
 (2) percutaneous transluminal coronary angioplasty (PTCA)

Bern, H. Hess in Munich, F. Kaindl in Vienna, Bugar-Meszaros in Budapest, Leo Widmer in Basel, A. Strano and C. Allegra in Rome, etc. The most significant step was the establishment of an independent vascular clinic by Max Ratschow in Darmstadt in 1953. He ini-

tiated the establishment of the German and also the Swiss Societies of Angiology. The development of angiology within the Cardio-Vascular Society in the former German Democratic Republic was very interesting, but the most important personalities like Horst Linke, Max Ratschow (1952), Hubert Mörl, Helmut Kleinsorge and Adreas Grüntzig left the country – the latter one even before he had finished his studies. There was very close co-operation between the German, Swiss and Austrian Angiological Societies. In 1972 they began to jointly publish the VASA magazine quarterly, and since 1977 they have jointly held symposia, "3 Country Meetings" annually, alternately in one of the countries. Since 1966 the "Kitzbühler Angiologische Symposia" have also been organized annually. According to Belcaro and Nicolaidis, angiology today is a real war requiring a complete general strategy. Integration is the key to solv-



**Fig. 1.** Heraclitus of Ephesus



**Fig. 2.** Hippocrates



**Fig. 3.** Aristotle of Stageira



**Fig. 4.** Galen



**Fig. 5.** William Harvey



**Fig. 6.** Johann Jessenius



Fig. 7. Leo Buerger



Fig. 8. Max Ratschow

ing the problem. That is why not only the International Union of Angiology but also individual national Societies recommend a multidisciplinary access to peripheral vascular diseases, in hospitals and also in primary care. The fundamental disciplines should be angiology, vascular surgery and vascular radiology, closely connected also with related disciplines. I have to say that at the Clinic of Bohumil Prusík (1886 – 1964) - the founder of Czech angiology, we started with similar access as early as 1958. As mentioned, the founder of Czechoslovak angiology was Bohumil Prusík, the 1<sup>st</sup> Czechoslovak citizen proposed for the Nobel Prize.

Prusík performed capillaroscopy and other angiological investigations as early as the period of World War I. The subject of his 1920 thesis was „Peripheral vessels and their role in blood circulation“. In 1928 he was the first physician in this country, and one of the first in the world, who performed, together with Volicer, angiography of the lower extremities. He devoted special attention to Buerger's disease. In the 1930s angiologists lectured and held their symposia in the cardiological society. The first mention of a working session of angiologists is in the 1936 minutes of the Czech Cardiological Society.

After the Second World War angiological meetings and conferences were held sporadically, usually at the headquarters of the Czech Medical Association in Prague and mostly within the framework of cardiology. The best known of these is the three-day angiological symposium held in 1955 at Spa Teplice. Unfortunately, documentary records of individual angiological events have not survived. Prusík's department trained many leading Czech angiologists. Another centre was set up in the 1950s at the Institute of Clinical and Experimental Medicine in Prague. The 1950s also saw the beginning of angiosurgery and 1960s the beginning of phlebology



Fig. 9. Bohumil Prusík

in this country. The physician Krčílek, the surgeon Rapant and somewhat later the dermatologist Konopík are the founders of phlebology in this country.

The official origin of phlebology, lymphology and vascular surgery in the Czech Republic was as follows (Tab. 7).

In 1958 Prusík's pupil Reiniš initiated the first epidemiological studies of coronary heart disease and ischaemia of the lower extremities. Thanks to his therapeutic interventions Reiniš laid the foundations, a few years later, of preventive cardiology in this country. In 1970 he set up what was called the Angiological Commission within the Czech Cardiological Society, which in 1981 was renamed the Society's Angiological Section. As late as 1993 this section was transformed into an independent Czech Angiological Society (Tab. 8).

Tab. 6. Textbooks on vascular diseases (first 40 years of the 20<sup>th</sup> century)

<p><b>1924</b>  <b>Leo Buerger (Bürger)</b> (1879 – 1943) Mount Sinai Hosp. New York (born in Vienna)                  The Circulatory Disturbances of the Extremities, Saunders (Philadelphia, London)</p> <p><b>1938</b>  <b>Max Ratschow</b> (1904 – 1963) Halle an der Saar, Darmstadt                  Die peripheren Durchblutungsstörungen, Steinkopff (Dresden, Leipzig) (1938, 1942, 1946, 1949, 1953)</p>
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Tab. 7. Origins of phlebology, lymphology and vascular surgery in the Czech Republic

<p><b>1969</b> Commission of Phlebology (as part of the Czech Dermatological Society)  <b>1973</b> Member of "Union Internationale de Phlébologie"  <b>1988</b> Section of Phlebology  <b>1992</b> Czech Phlebological Society (as a self-standing part of the Czech Medical Association)  <b>1992</b> Czech Lymphological Society (idem)  <b>2000</b> Cardiovascular Section of Society of Surgery became Czech Society of Cardiovascular Surgery (idem)</p>
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Tab. 8. Angiology in the Czech Republic

<p><b>B. Prusík</b> - Czech angiology first beginnings (1920s)  <b>Z. Reiniš</b> - Czech epidemiology of atherosclerosis and preventive cardiology (1958, 1966)  <b>Z. Reiniš</b> - Angiological committee and section of the Czech Society of Cardiology (1970, 1981)  <b>V. Puchmayer</b> - Czech Society of Angiology (1993)  <b>K. Roztočil</b> - Chairman of the Czech Society of Angiology (since 2000)</p>
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Tab. 9. Awards of the Czech Society of Angiology

<p><b>Prusík's Prize:</b> for the best publication in angiology (in previous year)  <b>Reiniš' Prize:</b> for the best publication in preventive cardiology, since 2000 in angiology of young scientists up to 35 years of age (in previous year)                  Sponsored by KRKA, Ltd., Ljubljana</p>
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Since the 1970s Angiological Days have been held every Spring, in recent years with international participation. They are called Traditional Angiological Days, because there are no reliable records about the number of such meetings between the two wars and until that time. As a tribute to outstanding Czech angiologists, the Czech Angiological Society awards annually two prizes for best studies published in the previous year (Tab. 9). Since 1995 regular Post-graduate angiological symposia have been held.

Angiology is also at a high level in the Slovak Republic. The evolution of Slovak Angiology is showed in Tab. 10.

The collaboration between Czech and Slovak angiologists has always been very close. For instance, it was apparent at 10 symposia on atherosclerosis between 1974 and 1994 (J. Kolár, Z. Reiniš), organized alternately in both republics. A great honour for Czech and Slovak angiologists was the common special issue of International Angiology in 1991. In the two republics there has been a chair of angiology since 1999 and 2004 respectively, and a specialization exam since 2003 and 2004 respectively.

In the minutes from the board meeting of the Czech Cardiological Society held on 21<sup>st</sup> November 1947 we read that „during his stay in Switzerland Prusík discussed with several well-known professors from Geneva, Paris and Belgium the holding

of international medical days on Peripheral vessels and that he agreed to convene such a meeting“. In view of this situation, the Czech Cardiological Society officially entrusted him with the organization of such an event. But because of the Communist putsch in February 1948 in Czechoslovakia, this first international angiological symposium could not take place. The first Congress was held thanks to Prusík’s insistence and with Gerson’s backing in 1950 in Paris. Two years later the two men helped lay the foundations of the International Society / Union of Angiology (Tab. 11).

It was not, however, officially announced until 1958 at the 3<sup>rd</sup> International Angiological Congress in San Remo. In recognition of their valuable contribution to the development of angiology, Czech angiologists were entrusted with the organization of the 4<sup>th</sup> (1961) and the 11<sup>th</sup> (1978) International Angiological Congresses in Prague. The official journal of IUA has been entitled International Angiology since 1980.

Due to the initiative of some angiological enthusiasts from Central Europe, especially from the Czech Republic and Italy, the Central European Vascular Forum was founded on 24 October 1997 in Rome. It now consists of the 9 countries which belonged once at least partially to the Austro-Hungarian Empire (Tab. 12).

**Tab. 10.** Angiology in Slovakia

<b>1950-52</b> – Angiosurgery founder W. Chorváth (pupil of R. Fontaine and R. Leriche)
<b>1952</b> – Angiology founder M. Ondrejčák (pupil of B. Prusík)
<b>1959</b> – Angiology in Košice, East Slovakia, founder G. Madar (pupil of B. Prusík)
<b>1970s</b> – International symposia "Exercise and Cardiovascular Function" organized by M. Palát
<b>1993</b> – Slovak Angiological Society (SAS) as autonomous section of Slovak Medical Association (SMA), to date 11 international symposia (P. Gavorník, J. Kmec, V. Štvrtinová)
<b>1997</b> – Section of Lymphology of SAS (A. Džupina)
<b>1998</b> – Section of Angiosurgery of SAS (J. Mazuch)
<b>2001</b> – Slovak Society of Angiosurgery as autonomous section of SMA (V. Šefránek)

**Tab. 11.** International congresses of angiology

0	1948 Prague	Prusík (cancelled)
1 <sup>st</sup>	1950 Paris	Leriche, Martorell
2 <sup>nd</sup>	1955 Fribourg	Gerson, Laszt
3 <sup>rd</sup>	1958 San Remo	Comél
4 <sup>th</sup>	1961 Prague	Prusík, Reiniš
5 <sup>th</sup>	1964 Paris	Audier
6 <sup>th</sup>	1967 Barcelona	Martorell, Salleras
7 <sup>th</sup>	1970 Liège	
8 <sup>th</sup>	1972 Rio de Janeiro	
9 <sup>th</sup>	1973 Florence	Pratesi
10 <sup>th</sup>	1976 Tokyo	Ishikawa
11 <sup>th</sup>	1978 Prague	Reiniš, Pokorný
12 <sup>th</sup>	1980 Athens	Balas
13 <sup>th</sup>	1983 Rochester	Schirger
14 <sup>th</sup>	1986 Munich	Maurer
15 <sup>th</sup>	1989 Rome	Strano
16 <sup>th</sup>	1992 Paris	Boccalon
17 <sup>th</sup>	1995 London	Nicolaides
18 <sup>th</sup>	1998 Tokyo	Yazaki
19 <sup>th</sup>	2000 Gent	Clement
20 <sup>th</sup>	2002 New York	Gloviczki
21 <sup>st</sup>	2004 Rome	Novo

**Tab. 12.** Congresses of the Central European Vascular Forum

1 <sup>st</sup>	1998 Prague	V. Puchmayer
2 <sup>nd</sup>	2000 Rome	C. Allegra
3 <sup>rd</sup>	2002 Portoroz	P. Poredoš
4 <sup>th</sup>	2004 Dubrovnik	T. Šoša
Congresses to be held:		
5 <sup>th</sup>	2006 Warsaw	M. Szostek
6 <sup>th</sup>	2008 Bratislava	V. Štvrtinová

**Tab. 13.** Educational Courses of the Central European Vascular Forum

1 <sup>st</sup> 2003 Prague – V. Puchmayer, K. Roztočil, J. Spáčil "Duplex ultrasonography of arteries and veins" (on the memory of Christian Doppler's 200 <sup>th</sup> birth anniversary /1803-1853)
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**Tab. 14.** Presidents of the Central European Vascular Forum

1 <sup>st</sup>	V. Puchmayer	Czech Republic	1997-2000
2 <sup>nd</sup>	C. Allegra	Italy	2000-2002
3 <sup>rd</sup>	P. Poredoš	Slovenia	2002-2004
4 <sup>th</sup>	T. Šoša	Croatia	2004-
Honorary President: A. Schirger		USA	since 1998



**Fig. 10.** Central European Vascular Forum logo

The Forum, however, is open to individual members from any country of the world. The purpose of the Forum is to promote close co-operation in research and the training of medical specialists from all theoretical and clinical disciplines related to angiology (Tab. 13-15).

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*Address for correspondence:*  
*Assoc. Prof. V. Puchmayer, MD*  
*Molákova 10*  
*180 00 Prague 8*  
*Czech Republic*

*Translation: Oldřich Louthan*