

**Arteritis obliterans of the lower extremity with intermittent claudication
("Angina cruris") / by F. Parkes Weber.**

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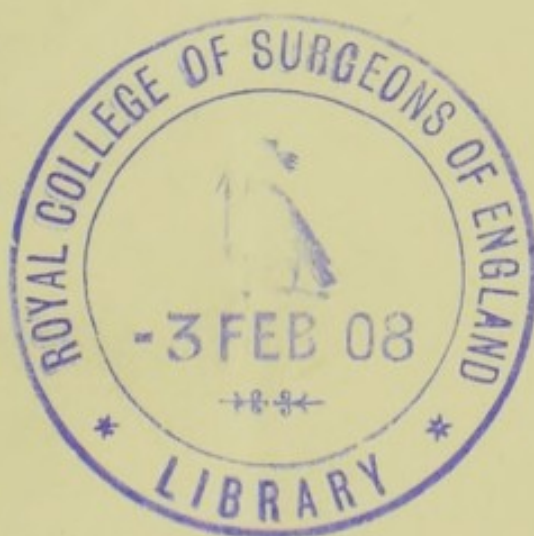
ARTERITIS OBLITERANS OF THE LOWER
EXTREMITY WITH INTERMITTENT
CLAUDICATION

(“ANGINA CRURIS”)

BY

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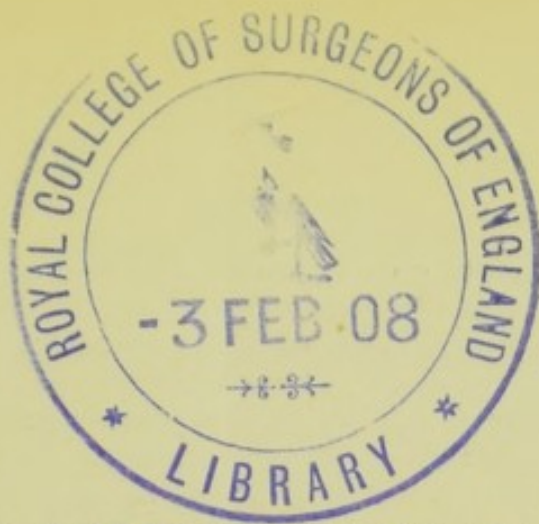


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ARTERITIS OBLITERANS OF THE LOWER
EXTREMITY WITH INTERMITTENT
CLAUDICATION ("ANGINA
CRURIS").

THE patient, a Russian Jew, aged 42 years,¹ seems fairly well nourished but complains of cramp-like pains in the inner part of the sole of the left foot (muscles of the instep) or in the calf of the left leg, which always attack him after he has walked for three or four minutes and oblige him to rest a few minutes before going on. No pulsation can be felt in the left dorsalis pedis artery nor in the tibialis postica artery behind the internal malleolus, though both these arteries² can be felt beating in the right limb. The pulsation of the femoral artery is normal in both groins. When the patient is examined lying in bed scarcely any difference between the two feet can be observed, but when the legs are allowed to hang over the side of the bed the distal portion of the left foot (unlike the right foot) becomes red and congested-looking, especially the fourth and fifth toes. If the patient then forcibly flexes and extends the ankle-joint a few times the skin of the foot in less than a minute loses its congested look and becomes blanched and alabaster-like. If muscular exertion (by walking) is continued for three or four minutes the patient commences to limp

¹ The case was shown at the Clinical Section of the Royal Society of Medicine on Dec. 13th, 1907.

² The tibialis postica artery cannot invariably be felt beating in the patient's right limb. The pulsation of this artery is, as is well known, often very difficult to feel in quite healthy persons with firmly-set, well-covered ankles. The same difficulty occurs with the pulsation of the popliteal artery, which in this patient can be felt on neither side.

and has to rest on account of cramp-like pains in the muscles of the instep or the calf. If examined at that time the foot appears pale but not so white as it does after only a few movements. The blanching of the foot can be to some extent lessened by making the patient inhale amyl nitrite but vaso-dilator drugs (trinitrine and amyl nitrite) fail to bring back pulsation to the left dorsalis pedis and tibialis postica arteries, although they distinctly increase the pulsation in these vessels on the sound side (right foot). There is no anæsthesia and the electrical reactions are normal and equal on the two sides. A Röntgen-ray photograph of the two feet shows that the bones of the little toe give less shadow³ in the left foot than in the right. There is no evidence of any disease elsewhere in the body. The radial arteries feel normal. The pulse is about 84, of moderate size and fair pressure. The brachial blood pressure (estimated by the Riva-Rocci apparatus⁴ with a broad band) is 135 millimetres of mercury in each arm. A blood count gives 4,175,000 red cells and 9000 white cells in the cubic millimetre of blood, and the hæmoglobin value is 90 per cent. of the normal (by Haldane's method). Microscopical examination of the blood films shows nothing abnormal. The urine is free from albumin and sugar. The knee-jerks and plantar reflexes on both sides are natural. The pupils are equal and react naturally to light. Ophthalmoscopic examination gives no evidence of disease. On the patient's admission to the German Hospital (August 8th, 1907) there was ulceration on the little toe of the left foot, but the ulcer has since then slowly healed up.

The treatment in hospital has consisted in rest in bed (at first), the application on alternate days to the affected extremity of local hot-air baths⁵ and Professor Bier's light

³ The Röntgen rays have shown that a certain amount of bone-absorption or decalcification undoubtedly sometimes occurs in parts affected by Raynaud's symptom-complex or arterial ischæmia of any kind.

⁴ Owing to the absence of pulsation in the affected foot the blood pressure in the lower extremities could not be compared by the Riva-Rocci method. Unfortunately, I was unable to employ plethysmograph methods.

⁵ In a case of commencing slight arterio-sclerotic gangrene (a man, aged 59 years) under treatment by local hot water baths W. Röpke (Münchener Medicinische Wochenschrift, 1907, No. 14, p. 666) had the satisfaction of observing return of pulsation in the dorsalis pedis and tibialis postica arteries of the affected extremity; the returning pulsation was at first only intermittently, but afterwards permanently, present.

ligature method of producing passive congestion, subcutaneous injections of fibrolysin (altogether 47 Merck's ampullæ have been used), medium doses of iodipin by the mouth, dermatol powder for the ulcer, and wrapping up of the foot. Recently the patient had been given Levico water. By all this treatment it is very difficult to know whether much good has been done. The patient certainly thinks he feels better and has gained weight, and the ulcer on the toe has healed up, but the cramp-like pains (already referred to) on walking persist. The affection commenced gradually about five years ago with pain in the sole of the foot on walking. Various methods of treatment have been tried, including electrical baths at the London Hospital (which certainly seemed to do good) under Dr. E. R. Morton and treatment at a thermal water health resort. He has been more or less threatened with local gangrene but so far has escaped with two attacks of slight ulceration on the little toe and one on the great toe. The ulceration in such cases is very indolent and slow in healing and may be termed "ischæmic ulceration"; by "ischæmic" it is meant to imply not that the blood in the affected part is actually deficient in quantity but that the rate and pressure of the supply are insufficient.

It is necessary to explain that the patient suffers from two distinct kinds of pain: (1) the cramp-like muscular pains of intermittent claudication ("angina cruris"), as already mentioned; and (2) a local pain and tenderness in the affected toes which have sometimes kept him awake at night, especially when there was ulceration. Sometimes there is also a third kind of pain apparently connected with the ankle-joint. The patient has previously enjoyed good health with the exception of an attack of "scrofulous" abscesses (some connected with bone disease) in Russia when he was four years old. The scars resulting from these abscesses are still very noticeable on examining the patient. There is no history of any venereal disease. He has always been moderate in the use of alcohol and likewise in the use of tea and coffee. He has been accustomed to smoke rather freely. The case is a typical one of the class of obliterative arteritis, which often leads to gangrene of extremities and occurs in men in the prime of life, especially in poor Jews from Russia who have been accustomed to smoke cigarettes rather freely. Within the last few years I have had the opportunity of seeing (partly owing to the courtesy of various colleagues) ten cases in male Jews of the East-End of London between

30 and 52 years of age, some of them employed in cigarette factories, where they could obtain cigarettes without paying for them. Syphilis apparently plays no part in the etiology. The really essential cause of the arterial disease in these cases still, however, remains unknown. It is possible that in these cases for some reason (insufficient exercise, imperfect diet, or too much cold) during the growing period of life the blood-vessels, especially those of the lower extremities, do not develop in proportion to the growth of the rest of the body. If this were the case it would be natural that during adult life the hypoplastic vessels should be specially liable to disease.

Cases in which amputation has had to be performed have been described by Dr. E. Michels and myself in 1903,⁶ and in the Transactions of the Pathological Society of London.⁷ Striking cases have been brought before the Clinical Society of London or published in English medical literature by Mr. A. Pearce Gould,⁸ the late Dr. W. B. Hadden,⁹ Mr. W. G. Spencer,¹⁰ and others. The pathology of the affection has been thoroughly studied and discussed by several writers on the continent, including F. von Winiwarter,¹¹ C. Sternberg,¹² A. A. Wwedensky,¹³ W. von Zoege-Manteuffel,¹⁴ Bunge,¹⁵ P. Wulff,¹⁶ and O. von Wartburg,¹⁷ and the relation of the vascular changes to

⁶ Brit. Med. Jour., Sept. 12th, 1903, p. 566.

⁷ 1905, vol. lvi., p. 223.

⁸ Pearce Gould: Transactions of the Clinical Society of London, vol. xvii., p. 95, and vol. xxiv., p. 134; and THE LANCET, March 15th, 1902, p. 717.

⁹ W. B. Hadden: Transactions of the Clinical Society of London, vol. xvii., p. 105.

¹⁰ W. G. Spencer: Ibid., vol. xxxi., p. 89.

¹¹ F. von Winiwarter: "Ueber eine eigenthümliche Form von Endarteritis und Endophlebitis mit Gangrän des Fusses." Archiv für Klinische Chirurgie, Berlin, 1879, vol. xxiii., p. 202. In C. Friedländer's original paper on Arteritis Obliterans, Centralblatt für die Medicinischen Wissenschaften, Jan. 22nd, 1876, the process of obliterative arteritis was discussed with no special reference to the present class of cases.

¹² C. Sternberg, Wiener Klinische Wochenschrift, 1895, Nos. 37 and 39.

¹³ A. A. Wwedensky: Archiv für Klinische Chirurgie, 1898, vol. lvii., p. 98.

¹⁴ Zoege-Manteuffel: Ibid., 1891, vol. xlii., p. 569; and Deutsche Zeitschrift für Chirurgie, 1898, vol. xlvi., p. 461.

¹⁵ Bunge: Archiv für Klinische Chirurgie, 1901, vol. lxiii., p. 467.

¹⁶ P. Wulff: Deutsche Zeitschrift für Chirurgie, 1901, vol. lviii., p. 478.

¹⁷ O. von Wartburg: Beiträge zur Klinischen Chirurgie, 1902, vol. xxxv., pp. 656-670.

the phenomena of Charcot's "intermittent claudication of extremities" has been repeatedly considered by W. Erb¹⁸ of Heidelberg and many others. I suspect that the cases described by Dr. H. Batty Shaw under the heading "Erythromelalgia" in a past volume of the Transactions of the Pathological Society of London¹⁹ were really examples of a similar arteritis obliterans. At the recent meeting of the Association of Physicians of Great Britain and Ireland (London, 1907) Dr. E. S. Reynolds of Manchester described some typical cases of intermittent claudication of extremities from the clinical point of view. No operative interference had been necessary in his cases.

Gangrene may sometimes, as in the case just described, be delayed for years. In a man now 44 years of age (like-wise of the Hebrew race) with arteritis obliterans in the right lower extremity the affection has remained at least two years to my knowledge without getting worse. Curiously enough, some of the cases with the most decided "intermittent claudication" seem to escape gangrene longest, as if, as Erb maintains, there were a decided nervous element in those cases in addition to the arterial obstruction. Similarly, with angina pectoris, it is often not the patients with the best marked attacks who die first. It must not be forgotten that "intermittent claudication of extremities" may be due to other kinds of arterial obstruction (such as that connected with an aneurysm) besides the so-called "idiopathic arteritis obliterans" which I have been discussing. On the other hand, this idiopathic arteritis obliterans of extremities does not invariably give rise to the typical phenomena of intermittent claudication. Thus, in the case of a Russian Jew, aged 52 years, whom I have recently seen, the complaint has been of pain in the instep or in the big toe of the right foot which commenced about two years ago but there has been no real intermittent claudication on walking. Yet pulsation in the dorsalis pedis artery is quite absent on the right side, though easily felt on the left

¹⁸ Vide W. Erb, "Ueber das intermittierende Hinken," Deutsche Zeitschrift für Nervenheilkunde, Leipzig, 1898, vol. xiii., p. 1, and Erb's later writings on the subject, including "Ueber Dysbasia Angiosklerotica (Intermittierendes Hinken)," Münchener Medicinische Wochenschrift, 1904, vol. xxi., p. 905; "Zur Kasuistik der Intermittierenden Angiosklerotischen Bewegungsstörungen (Dysbasie. Dyskinesie) des Menschen," Deutsche Zeitschrift für Nervenheilkunde, Leipzig, 1905, vol. xxix., p. 465; and Ein weiterer Fall von Angiosklerotischer Bewegungsstörung des Armes, *ibid.*, 1906, vol. xxx., p. 201.

¹⁹ 1903, vol. liv., p. 168.

side. In that patient, however, pulsation in the tibialis postica artery of the affected extremity can be felt.

Intermittent claudication of extremities ("intermittent limping," "dysbasia intermittens" of Erb,²⁰ dyskinesia intermittens,"²¹ "dyspragia intermittens" ²²) was described by H. Bouley²³ (1831) in horses, by Charcot²⁴ (1858) in men, and afterwards by many other writers. Great analogy between the phenomena of arterial obstruction in the leg and the phenomena of angina pectoris has been insisted on by Allan Burns²⁵ (1809), Sir Benjamin Collins Brodie²⁶ (1846), Potain²⁷ (1870), and notably by Huchard.²⁸ Some authors (G. L. Walton and W. E. Paul)²⁹ even speak of intermittent claudication of the lower extremity as "angina cruris." "Angina cruris," like "angina pectoris," occurs much more frequently in men than in women. The interest of the present case lies chiefly in the remarkable spastic contraction of the minute cutaneous blood-vessels of the

²⁰ The term suggested by Erb (in 1898) was "dysbasia intermittens angiosclerotica."

²¹ Owing to the affection not being necessarily confined to the lower extremities but sometimes affecting the arms, the term "Dyskinesia intermittens angiosclerotica" was regarded as preferable by H. Determann, *Deutsche Zeitschrift für Nervenheilkunde*, 1905, vol. xxix., p. 152. Amongst more recent papers see also Oehler, "Ueber einen Bemerkenswerten Fall von Dyskinesia Intermittens Brachiorum," *Deutsches Archiv für Klinische Medizin*, Leipzig, 1907, vol. xcii., p. 154.

²² The term "Dyspragia intermittens angiosclerotica" was introduced by N. Ortner in reference to analogous disorders in the intestines and abdominal viscera. See N. Ortner, "Zur Klinik der Angiosklerose der Darmarterien (Dyspragia intermittens angiosclerotica intestinalis)," *Volkmann's Sammlung Klinischer Vorträge*, Leipzig, 1903, No. 347. For such disorders of the abdominal viscera the term "angina abdominis" has been used by F. Perutz, *Münchener Medicinische Wochenschrift*, 1907, No. 22, p. 1075.

²³ H. Bouley: *Archives Générales de Médecine*, Paris, 1831, vol. xxvii., p. 425. Bouley first introduced the term "claudication intermittente."

²⁴ Charcot: *Comptes Rendus de la Société de Biologie*, Paris, 1858, vol. v., p. 225.

²⁵ Allan Burns: *Observations on some of the most Frequent and Important Diseases of the Heart*. Edinburgh, 1809. Professor Osler, in his well-known *Lectures on Angina Pectoris*, *New York Medical Journal*, Oct. 31st, 1896, p. 572) specially drew attention to this priority of Burns.

²⁶ Brodie: *Lectures on Pathology and Surgery*, London, 1846, p. 360.

²⁷ According to Huchard, *Madadies du Cœur*, second edition, Paris, 1893, p. 517 and p. 608, Potain spoke of angina pectoris as "painful intermittent claudication of the heart."

²⁸ Huchard: *Ibid.*

²⁹ Walton and Paul: *Boston Medical and Surgical Journal*, April 3rd, 1902, p. 351.

foot which precedes the muscular cramp-like pains (angina cruris). For this reason the case might almost be described as one of "angina cruris (or rather angina pedis) vaso-motoria." It presents in this respect a striking analogy to the form of angina pectoris described by Nothnagel³⁰ (1867) as "angina pectoris vaso-motoria," in which the painful phenomena of angina pectoris were preceded by contraction of cutaneous blood-vessels. Nothnagel in his cases thought that the whole symptom-complex was of vaso-motor origin and that there was no organic disease present, but by necropsies on two cases of angina pectoris with very decided vaso-motor symptoms Hans Curschmann³¹ proved the presence of sclerotic changes in one of the coronary arteries. Just as there are cases of angina pectoris ("pseudo-angina") without organic disease of the coronary arteries, so according to Oppenheim and Hans Curschmann³² there are probably also cases (though rare) of intermittent claudication of extremities without organic arterial disease—a "dysbasia intermittens angiospastica" in contradistinction to "dysbasia intermittens arteriosclerotica." So also A. Westphal³³ has recently described the case of a woman, aged 43 years, suffering from recurrent attacks of a vaso-motor neurosis, during which temporary absence of pulsation in the dorsalis pedis artery was noted.³⁴

The congested condition of the foot in the present case and in similar cases (best marked, of course, with the limb in the dependent position) is, I believe, of "conservative" nature, and it may be explained as an automatic attempt to compensate (for the arterial obstruction) by dilatation of

³⁰ Nothnagel: *Deutsches Archiv für Klinische Medizin*, Leipzig, 1867, vol. iii., p. 309.

³¹ Hans Curschmann: "Ueber Vasomotorische Krampfstände bei echter Angina Pectoris," *Deutsche Medicinische Wochenschrift*, 1906, vol. xxxii., p. 1527. See also E. Schmoll, "Ueber Motorische, Sensorische und Vasomotorische Symptome verursacht durch Koronarsklerose und sonstige Erkrankungen der Linkseitigen Herzhälfte," *Münchener Medicinische Wochenschrift*, 1907, No. 41, p. 2027.

³² Hans Curschman: "Untersuchungen über das Functionelle Verhalten der Gefäße bei Trophischen und Vasomotorischen Neurosen," *Münchener Medicinische Wochenschrift*, 1907, No. 51, p. 2519.

³³ A. Westphal: "Ueber Hysterische Pseudotetanie mit Eigenartigen Vasomotorischen Störungen," *Berliner Klinische Wochenschrift*, 1907, No. 49, p. 1567.

³⁴ Organic vascular changes may follow recurrent angiospasm, as noted in some cases of very chronic Raynaud's disease, but in some of these cases it must be remembered that there may be a syphilitic element present (especially congenital syphilis).

capillaries and venules—that is to say, it may be explained as an automatic attempt to favour collateral circulation as far as possible, and to make up for deficiency of the arterial supply by increase of the total quantity of blood in the affected part.³⁵

Harley-street, W.

³⁵ Cf. F. P. Weber: "Sequel of a Case of Trophic Disorder of the Feet," *British Journal of Dermatology*, 1902, vol. xiv., p. 392. In ordinary hæmorrhagic infarctions of the lung from embolisms we have, I believe, a striking instance of automatic attempts (though ineffectual ones) to compensate for arterial obstruction by extreme dilatation of capillaries and venules. On the other hand, "local syncope" due to temporary angio-spastic conditions (such as those readily excited in some persons by the application of cold) may, as is well known, be followed by reactionary hyperæmia when the vascular spasm ceases. Local congestion may, therefore, either accompany or alternate with arterial obstruction.