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This remarkable and interesting condition which bears the name of Raynaud was first described by him in 1862 under the name of "Local Asphyxia and Symmetrical Gangrene of the Extremities," and again with a report of several cases in the Paris Archives of Medicine for 1874.

Since then other observers have reported similar cases. In all instances the attention is first attracted by the bluish color of the extremities. This will oftentimes, without any apparent cause, change to a violaceous, almost black color, which persists some hours and the parts then resume their ordinary hue.

These attacks, which first called Raynaud's attention to the condition, received from him the name of local asphyxia.

The thumbs are not affected and the color never becomes normal, especially upon the left hand.

During several attacks of local asphyxia an indistinctness of vision was observed and an ophthalmoscopic examination made at the time showed contractions of portions of the arteries in the fundus which would take place under the eye of the observer, persist for a while and then disappear to form in another part of the artery. The uncontracted portion of the artery remained dilated to its full extent, and a strong pulsation could be seen in the veins. During the intervals of cyanosis the vessels were wider and the pulsation in the veins persisted. The right eye was less affected than the left.

Raynaud further experimented by cutting the end of the cervical branch of the sympathetic, and applied an electric current to the distal cut end, producing the characteristic vessel contraction, which relaxed on stopping the current. He therefore suggested that the cause of the disease might be found in some abnormal excitement of the vaso-motor nerves.

Since it had been demonstrated that a spasmodic contraction of the arteries of the eye takes place during an attack, it is but reasonable to suppose that the same condition affects all the arteries through the body. This contraction will not interfere with the perviousness of the larger arteries, but will only make itself noticeable when it comes to affect the terminal filaments, where a slight amount of contraction will be enough to shut off the calibre almost completely.

When the arterial walls are thickened by the infiltration of syphilis or the connective tissue growths accompanying contracted kidney, it will be easy to see how an amount of vaso-motor spasm which would be scarcely noticed in a healthy artery can entirely close the already contracted vessel.

Jacoby[1] and Sturmdorf[2] have raised the question as to whether a number of cases, which have been reported as Raynaud's Disease, were not in reality due to other conditions aside from a pure vaso-motor spasm, and have suggested that cases resembling two of the following were not Raynaud's Disease, but the results of an obliteration of the artery from organic disease of the vessel walls.

It seems to me probable that if the element of vaso-motor spasm had been entirely absent in cases II. and III., reported below, the circulation would have been maintained constantly at the same plane or a gradual lessening would have taken place until gangrene had supervened and the characteristic periodical attacks of local syncope would not have been observed.

It would not seem illogical to consider that the conditions found in these cases were due to a combination of circumstances.

One peculiarity of the disease is that all the extremities of the body, hands, feet, nose and ears, may be affected, but not of necessity in an equal degree. The toes may show but slight marks of an abnormal circulation or may be severely affected. Any partial occlusion of the terminal arterioles will result in diminish-

1. *N. Y. Med. Journal*, February, 1891

2. *Med. Record*, August 1, 1891.

ing the *vis a tergo*, the blood flows slowly through the capillaries, which soon become dilated. This dilatation in itself is a favoring element in bringing about an increase in the condition of passive congestion, which is a feature of the various stages of the disease.

The retarded circulation affects the nutrition of the tissues, more especially the finger ends and appendages. The nails in some cases become dry, brittle and split. On examination they are found flattened and eroded. The pulp of the finger tips is absorbed, and the epithelium scales off. The tactile sensibility may be diminished. The temperature of the fingers is sub-normal, on account of the enfeebled circulation, and the patients always complain of coldness, which is also very evident to the observer. The color of the extreme ends of the fingers may be white and pale, and any exposure to cold will temporarily increase the pallor by still further lessening the supply of blood.

Beyond the borders of the zone of local anæmia the tissues are bluish or livid in color, from the capillary venous stagnation. In other cases the fingers are not pallid, but the bluish color extends to their extremities.

Pain is intense in some cases, in others it is absent.

While the arterioles retain their perviousness the disease progresses very slowly. But in course of time a complete obliteration of the vessels may take place, shutting off all the supply of arterial blood, and the tissues heretofore insufficiently nourished, now deprived of their pabulum, rapidly necrose. The necrosis is limited to the soft parts, and does not include the bone. As in ordinary cases of gangrene, a line of demarcation forms and the new granulations push off

the necrotic mass. The necrosis may be limited to the tip of a single finger. It may involve all the fingers of one hand, or both hands and toes may be affected in a greater or less degree.

With regard to the questions of prognosis and treatment it may be convenient to consider the disease according to its etiology.

There are three conditions which will produce a complete or partial obliteration of the calibre of the vessels:

Class I.—Spasmodic contraction of the muscular fibres of the vessel walls due to vaso-motor influences.

A. B., aged 40; occupation, farmer; residence, central part of New York State; came to my clinic at the Long Island College Hospital with the following history: Several years ago he had begun to suffer greatly with cold fingers in the winter. The two terminal phalanges would become white, and remain so for hours. The remainder of the hand was livid. The duration of the attacks increased so that finally the fingers would remain white, livid and cold all winter and then finally both winter and summer. He was liable to attacks of an increase and deepening of the livid color so that it would become almost black, remain so for some hours, and then give place to the ordinary appearance. The nails also underwent the usual changes. Two years ago, half the soft parts of the second terminal phalanx of the left hand became gangrenous and sloughed off. This patient had never had syphilis, and was a strong, vigorous, robust man. His urine was normal. This case was seen by Drs. Sherwell, Wight and Winfield, who all concurred in the diagnosis.

This was undoubtedly a case of pure vaso-motor spasm, such as Raynaud described in his original series of cases.

The treatment which he applied was the descending current with a view to lessening the excito motor power. The positive pole was placed on the spinous process of the seventh cervical vertebra and the negative in the lumbar region.

The result of this treatment was very successful in all his cases. An improvement was observed immediately after the first application, and as the treatment was continued the patients grew better until the color and temperature of the hands became normal.

Class II.—Arterio-fibro sclerosis accompanying chronic interstitial nephritis.

Mrs. R., age 35, and mother of six children, five living and healthy. No history of syphilis. Came under my care in March, 1891. She had suffered for a number of years from the effects of a chronic interstitial nephritis, and once or twice a year would have an attack of fever, gastric disturbance, urine loaded with albumen and urates in large quantities. During the intervals urine was profuse in quantity, of low specific gravity and with occasionally a trace of albumen. She had also the characteristic increase of vascular tension. In November, 1892, as she was recovering from such an attack, she began to complain of intense pain in the fingers of both hands. They had been cold and white and occasionally blue for a long time before. The fingers of the left hand became livid, then black, and finally all the terminal and second phalanges became necrotic and sloughed. After a distinct line of demarcation had formed, with the assistance of

my friends, Drs. Shaw and Baldwin, I amputated the fingers and secured a good result. The patient is living to-day, and the fingers of the right hand are cold, and white and bluish, which becomes much darker at times. In this case I believe the shutting off of the circulation to be due to the general change in the walls of the arteries accompanying the chronic interstitial nephritis with very probably a superadded element of vaso-motor spasm.

In such a case as this nitro-glycerine would probably have a beneficial effect from its action in lessening vascular tension and relieving vaso-motor spasm and thus assisting to maintain the perviousness of the arterioles.

Class III.—Endarteritis of syphilis.

J. R., England, age 36, came to my clinic at Long Island College Hospital Dispensary, and stated that fifteen years ago he had acquired syphilis, but that after three months' treatment had never shown any manifestation of the disease.

For some years past his fingers and toes have been cold and white and the hands have been livid. He has observed that the blue color of the hands would become markedly increased at times. This would persist for a short time until the usual bluish color returned. His finger nails and pulps and the skin about them show marked evidence of impaired nutrition, and the toes as well. The temperature of the left hand is noticeably lower than the right. An examination of the chest fails to show either aneurism or valvular disease of the heart which could produce an embolus. His urine is normal. I presented this patient at a meeting of the Brooklyn Dermatological Society as a

very mild form of Raynaud's Disease due to a partial obliteration of the vessels from endarteritis together with a superadded element of vaso-motor spasm. The gentlemen present all agreed in the diagnosis.

In cases of this class I believe the prognosis is more favorable than in the others. I placed the patient on anti-syphilitic treatment. Under the influence of small doses of bichloride and increasing doses of iodide of potash up to the limit of sixty grains three times a day continued for some weeks, his condition has improved; the color of his hands is better, they are not as cold and he has not had any attacks of local asphyxia of late.

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