

AINHUM,

WITH REPORT OF A CASE.*

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ALTHOUGH practically half a century has elapsed since Clark, in a monograph read before the Epidemiologic Society of London, called attention to this peculiar disease affecting the natives of Brazil, the characteristic feature of which is the spontaneous amputation of the affected fingers and toes, it is true that we know very little concerning ainhum.

The disease has been observed in various parts of the civilized world, although only about twenty-four cases have been observed in the United States; the present case being probably the first one reported occurring in Missouri. The literature reveals the fact that the disease is very prevalent in India. The patient is usually a negro; not more than four cases have been reported in which the patient was a Caucasian.

The etiology of ainhum remains an open question. The researches of da Silva Lima led him to regard the disease as due to injuries to the toes, while Scheube contended that ainhum was a trophoneurosis. Zambaco Pacha believed the disease to be a lesion of leprosy. Wellman has recently stated that he agrees with McFarland, who said: "The true cause of the fatty and atrophic changes in the amputated toe is not determined; it may be trophic, or it may depend on local cicatricial formation." In Wellman's opinion, the chigger may play an important role in prolonging the irritations and inflammations set up by wounds at the base of the toes. The probability of a parasitic origin has been scouted by many;

* From Surgical Dept., Washington University, Service of Dr. H. G. Mudd.

personally, I feel that time may prove the disease of parasitic origin. It certainly does not seem at all plausible that such a destructive process could be brought about by sharp grasses and the like, as has been long advocated by several observers. The fact that the disease has been observed in persons who have reached the meridian of life and who have worn shoes constantly since adolescence, tends, I think, to overthrow da Silva Lima's theory. Possibly we may find that uncleanness advances the development of the disease. Many of the theories that have been advanced by the early writers are quite preposterous. Dupouy has observed the occurrence of loin pains at the commencement of some of his cases, and the tendency of the disease to run in families.

Unna regards *ainhum* as a primary degeneration of the epidermis. It is, in Unna's opinion, a sort of ring-formed sclerodermis, with callous formation of the epidermis, leading to secondary total stagnation necrosis. The horny layer is much thickened, and the papillæ are elongated and narrowed. In the papillary body, there is cellular infiltration; the papillary vessels are dilated, and the larger and deeper-lying vessels of the cutis and the hypoderm show obliterating endarteritis in different stages of development. The *membrana propria* is thickened. In discussing the pathology, Brayton says: "These are the progressive changes found in stagnated dermatoses. When the stratum corneum becomes thickened even in small areas, as in corns, atrophy of the underlying epidermis occurs. It is to be expected, therefore, that, with this hyperplasia of the epidermis and downgrowth of the interpapillary process, the corium should show an increase of fibrous tissue and fat; that owing to pressure there should be changes in the deeper blood-vessels and arteries; an increase of the adventitia or intima coats of the arteries so that the lumen is impaired, and finally obliterating endarteritis with slow gangrene. Eventually the constricting band approaches the bone; tumefaction of the toe occurs with stagnation of lymph and fat, gradually causing degeneration of all the constituents of the above tissue, pulp and cutis; a

condition of rarefying osteitis takes place, with final disappearance of the ungual phalanx, the partial disappearance of the second, and almost always the preservation of the third. The line of division may occur through the middle of the proximal phalanx or at the proximal interphalangeal articulation."

In our case, the patient's attention was first called to a small nodule situated on the dorsal surface of the little toe of the right foot, just at the edge of the phalangeal-metatarsal articulation. The nodule deepened and extended to the inner side of the little toe, eventually causing constriction, and the other clinical manifestations of the disease in question. The true pathology of *ainhum* will continue to remain in question until the etiology of the disease has been determined.

The clinical manifestations of *ainhum* are quite constant. The disease begins, as a rule, with a crack, fissure or nodule at the base of the toe on either the plantar or inner side. In our case, the patient's attention was first attracted to a small nodule on the dorsal surface at the base of the little toe; itching was present. The fissure deepens, gradually encircling the toe. Ulceration, bleeding and discomfort are seldom present. The distal portion of the toe becomes rounded and ball-like in appearance; it may be wider transversely than anteroposteriorly. The disease progresses very slowly; it may require ten years to completely sever the toe. Pain is seldom severe; in our case, however, the patient suffered so much at night that he could not sleep. The toe is frequently subjected to trauma.

Ulcers may appear late in the course of the disease. Palpation may be painful to the patient. When the bone has been destroyed and the toe is but loosely attached to the foot, the patient may complain severely of pain on walking. The distal portion of the toe may seem perfectly healthy; sensation may not be impaired. The medical attendant seldom sees these patients during the early course of the disease. In some instances the patient does not present himself for treatment until several of his toes have been spontaneously amputated.

PLATE I.



D. Babler's case of aneurysm.

PLATE II,



Longitudinal section of toe. Note constriction.

The diagnosis is not difficult. In Raynaud's disease there are preliminary lesions such as bullæ, vesicles, edema, etc.; constitutional symptoms are present; the lesions are symmetrical. In leprosy there are other manifestations of the disease, on other regions of the body pointing to the true character of the affection; preliminary manifestations precede the destructive process. The mere fact that there is a constricting band at the base of the toe causing gradual amputation of the affected appendage should arouse suspicion.

The prognosis depends upon the degree of destruction present at the time that the patient comes for treatment. Conservative treatment has been unsatisfactory because the medical attendant does not see the patient early enough. Linear incision and antiseptic dressings will probably suffice in the early cases. Amputation is indicated when the disease has produced absorption of the bone. The necrotic mass found in some cases should be evacuated and the sac walls swabbed with carbolic acid; then cleaned with alcohol, and dressed daily.

Report of Case.—James A., aged 50, a colored man, presented for treatment at the Surgical Clinic of the O'Fallon Dispensary, and gave the following history: Born in Virginia, where he remained five years, then moved to Alabama, residing in the latter state for twenty-five years; moved to Tennessee, and seven years later he came to Missouri, where he has lived during the past thirteen years. The family history is negative. Patient has always enjoyed good health until nine years ago, at which time he contracted syphilis. Three years thereafter, gummata appeared on both sides of neck. About six years ago he suffered a paralysis of right side of face; appeared suddenly and has remained.

About a year ago the patient observed a small warty-like growth on inner side near the dorsal surface at the base of the little toe of the right foot. He removed it by means of his pocket knife. Within a few weeks a similar but larger growth presented at the same side, and continued to grow; within three months it had partially encircled the base of the little toe. His attention has been frequently called to the growth owing to the presence

of more or less pain in the base of the affected toe. A singular feature is the fact that the pain has been worse at night. During the past five months the distal portion of the affected toe has been gradually assuming the appearance of a ball; the hard dense growth which has extended around the circumference of the toe has gradually produced absorption of the bone; the toe may be moved as though it was but slightly adherent to the foot.

Examination shows the usual findings in *ainhum*. The reader is respectfully referred to plate I. Leprosy was readily excluded. The glands of the neck were found swollen and firm; not painful; evidence of frequent incisions. The right side of face is paralyzed. At the base of the little toe of the right foot is a semi-solid mass which presents the appearance of being a continuation of the destructive process observed in the little toe. Pressure causes pain.

Amputation of the affected, and practically destroyed toe, was advised. A few days later the toe was removed under a local anesthetic. At the base of the little toe, just internal to the phalangeal-metatarsal articulation, was found a necrotic, bloody-looking mass about as large as a small hazelnut, which led me to believe that the disease was extending to the ring toe. The parts were thoroughly swabbed with pure phenol and then with alcohol. The incised surfaces were apposed by means of sutures, and the parts dressed with moist bichloride gauze. Owing to the fact that the patient would not consent to enter the Washington University Hospital, he was compelled to return home; he placed more or less of his weight upon the right foot, thereby causing two of the sutures to cut out. At the end of ten days the parts had, however, healed. At present the patient can walk and work without discomfort.

Plate II. is a beautiful reproduction of a longitudinal section of the diseased toe. The tissues on the inner side of the constricted portion of the toe were of such firm consistency that the microtome would scarcely cut through them. This is the first longitudinal section that I have seen in any publication. I am deeply indebted to Dr. Tiedemann for his kindness in making microscopic sections, and to Dr. H. G. Mudd for permission to report the case.

FIG. 1.



Arrest of growth at lower end of radius following fracture involving the epiphyseal line.