A CASE
OF
INJURY TO THE BLOOD VESSELS
OF THE
LOWER EXTREMITY,
PRODUCING
PALE DRY GANGRENE IN THE FOOT.

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I AM induced to hope that the following account may not be unacceptable to the members of the Medical and Chirurgical Society, as there is not to be obtained from their transactions, hitherto, any direct information upon the subject of Dry Gangrene, and as this disease, and especially its pale variety, is of so rare occurrence as to be comparatively unknown, by personal observation, to many medical practitioners in this country.

On Friday night, September 5th, 1823, Mr. T. M., aged 32 years, received a blow in his left groin, from the shaft of a van, against which he rode with great violence. At the time of the accident he is stated to have lost about a pound and a half of dark coloured blood, and to have

been taken up senseless. In about half an hour I found him sensible, but exceedingly pale and restless, and complaining of great pain in his leg and foot. His pulse 120, and feeble. The external wound was about three inches long, and parallel to Poupart's ligament. On removing the coagulated blood, the femoral artery and vein were exposed for upwards of an inch of their course; the former vessel pulsating forcibly, the latter fully distended. There was now only an oozing of venous blood. My finger passed readily into a cavity extending for more than two inches, directly backwards, on the inner side of the great blood-vessels, and on a level with the origin of the profunda; for about the same extent towards the anterior superior spinous process of the ilium; and for three inches between the integuments and the fascia on the inside of the thigh. I considered it impossible to heal the wound by the first intention; it was loosely lined with lint, and its edges slightly approximated.

September 6th, 10 a.m. Mr. Heaviside, Mr. Guthrie, and myself attended with Mr. Lightfoot. The patient has had some sleep, and his mind is calm. He has felt no pain, excepting that peculiar and distressing sensation in his foot, which he distinguishes from common pain. His pulse 130, very small. He has lost all feeling in the lower half of his leg, which is cold, pale, and cadaverous. No pulsation is to be felt in the arteries of his in-

jured limb. Towards evening, a distinct difference of temperature was observable at about four inches above the left knee, and the cadaverous coldness had extended a little higher up the leg. He now thought he perceived the warmth of the hand applied to his ankle ; he said " he had more life in his leg ;" he had slept a little, and seemed refreshed.

September 7th. Pulse 120 and fuller. The cadaverous coldness extends as high as the insertion of the ligamentum patellæ, and a slight degree of discoloration is now beginning to appear around the limb at this part.

In the evening the pain in his leg was much increased ; he distinguished to what part of his foot the warmth of my hand was applied for a few seconds ; but at the first applying it, he felt nothing : the tibial and peroneal muscles had still some power to move the foot : pressure in the ham produces intense pain in the shin. From this time it will be sufficient to mention generally the changes that took place. On the 8th, he was ordered to take at night, twelve of *Magendie's Gouttes Calmantes*, which not procuring sleep, he took fifteen the next evening ; and on the 10th he took twenty-five, which dose he continued daily until the 20th, when he was ordered to take five more on account of the violence of the pain which he suffered chiefly in the morning. On the

12th it was judged necessary to give him the infus. cinchonæ. which was changed for the decoction on the 14th.

At this time (the ninth day from the period of the accident) the discoloration occupied the same extent as before-mentioned, except that it had spread a little on the inside, having throughout become gradually of a deeper hue. He still perceived the warmth of the hand applied over the metatarsal joints, or to the heel; and a vein on the inner side of the foot appeared on the 11th to swell below pressure. There was hitherto no vesication, nor any sign of the approach of inflammation at the margin of the discoloration, except great tenderness. There was a very faint yellowish tinge on the knee, which to the touch seemed colder than the thigh. The calf was more sensible to firm pressure than it had been, and its hue, which was like that of a bruise, and not livid, when dispersed by firm pressure did not return, so that on the morning of the 14th I recognized the pale spots made by the pressure of my finger the preceding evening. Just above the ankle the skin was pale; the ankle itself, and the foot, having gradually assumed a deep transparent colour, not unlike that of new mahogany, and which did not disappear under any pressure. The toes were dried and shrunk, they were also paler than the ankle, and their substance was transparent, their appearance being precisely that of similar parts

dried and immersed in turpentine. They, however, never lost their cuticle, which is stated by one author always to be lost previously to the desiccation of parts suffering dry gangrene. After the 15th of September, the patient's pulse had risen to 110, and upwards; his spirits frequently failed; he became costive; and he had a complete pyrexial attack every afternoon; during the hot stage of which, in general, though occasionally at other times upon making some necessary exertion, he lost daily an ounce or two of blood from the wound.

On the 18th. He had suffered considerably for three days, from febrile irritation, and from costiveness; the medicines prescribed succeeded, however, this day in relieving him, and he was ordered to take three grains of the sulphate of quinine, with a fluid-drachm of the tincture of cinchona in each of his draughts, of which he took six in the twenty-four hours. The wound, which till lately had gone on in all respects exceedingly well, was now glassy, and discharged unhealthy matter. Patches of discoloration appeared above the femoral condyles. There was an increase of heat below the knee, and some few vesicles with an increase of redness were observed around the margin of the old discoloration. The whole leg was somewhat tumefied, but not emphysematous; and he took a much longer time

than formerly to distinguish when the warmth of the hand was applied to the foot.

On the 20th, the wound had resumed a granulating surface, and it retained from this time a healthy appearance, continuing, however, to discharge daily a small quantity of blood. One piece of lint introduced on the night of the accident into the bottom of the wound, having been till now entangled in the granulations, came away this day; and firm pressure being made around the wound, it was followed by a small quantity of healthy pus, streaked however with sanies.*

* From the 10th of September, the 5th day after the accident, the temperature of the injured limb was measured by means of Fahrenheit's Thermometer, and the results were as in the following table. It appears that the heat of the toes continued nearly the same, being always a little less than that of the chamber; whilst the heat of the ankle, exceeding that of the room, varied considerably.

Sept.	Room.	R. Toes.	L. Ham.	L. Calf.	L. Ankle.	L. Toes.
10.	69°.	90°.	70°.	—	—	66°.
11.	69°.	—	90°.	75°.	—	69°.
12.	74°.	—	90°.	80°.	—	72°.
13.	—	—	95°.	81°.	—	71°.
14.	—	—	96°.	82°.	80°.	70°.
15.	—	—	96°.	82°.	80°.	70°.
16.	—	—	96°.	75°.	71°.	68°.
18.	—	—	100°.	75°.	71°.	68°.
19.	—	—	95°.	85°.	72°.	—
21.	64°.	—	—	—	72°.	—

Tuesday, September 23d. Mr. Heaviside, my Father (who had attended since his return from the country, on the 9th), Mr. Guthrie, Mr. Lightfoot, and myself, being present, a coagulum of blood as big as a walnut, and beginning to have its surface broken by putrefaction, was this day pressed up from the depth of the wound. There followed immediately, a quantity of dark coloured blood; and upon this being sponged up, an alarming hemorrhage commenced. The blood flowed with great force from several orifices into a cavity capable of containing two ounces or more, extending to the head of the femur, and to the triceps, and opening into the external wound. After an arduous operation the bleeding vessels were secured; but the patient was exhausted; he sunk, and died at midnight.

DISSECTION.

The arteries were all impervious in the neighbourhood of the wound; but the inguinal, the femoral, and the profunda veins were found separated by ulceration, and terminating by open mouths in the depth of the wound. These vessels had all been tied, so that the patient died from constitutional debility the effect of an intemperate life, of the injury in his groin, and of the loss of blood previous to the operation, with that of about a pint and a half which escaped rapidly while it was being performed. The muscles of the

leg were rather livid when first exposed, but not at all disorganized. It is remarkable that although there were some traces of florid blood in the anterior tibial artery, the femoral was found distended below the seat of the wound, with blood of the deepest modena hue. The colour of the calf of the leg was become very much darker since yesterday morning.

This patient's sensibility to warmth applied but just above the desiccated parts of his foot (although it was insensible to all other impressions) proves its nerves to have retained to the last some degree of vitality: and it may be worthy of inquiry, whether the drying of his toes, their cuticle remaining on, and the rapid desiccation of the limbs of some other patients, are not to be attributed (rather than to evaporation alone) to some degree of activity remaining in the *absorbents* of their affected limbs.

The state of this patient's limb, and the history of his case demonstrate that the powers of his constitution were expended to no beneficial end; no effort being made to separate the dead parts from the living, whilst the remains of life in the calf of his leg were to be preserved.

In conclusion I may mention an observation of my father's, which I find confirmed in the writings of others, that the pale, or white dry gangrene, as

it is more commonly called, takes place only where the veins of the parts affected are not obliterated ; and that, on the contrary, the black dry gangrene is one result of the obliteration of both sets of blood vessels.