

GAS GANGRENE IN GUNSHOT WOUNDS.

In an article in the *British Medical Journal* on "Amputations at Base Hospitals in France," Lieut.-Colonel C. Gordon Watson, G.M.G., F.R.C.S., gives an interesting description of gas gangrene. He writes:—

"Gas gangrene," following gunshot wounds in this war, instead of being a rare occurrence, as in civil practice, is quite common. The onset and progress of the gas distension of a limb which precedes the gangrene is rapid beyond belief, unless seen.

In one case of wound of the thigh, under our care, within six hours of the first signs of the onset, gas had extended up to the axilla and down to the ankle.

In another case of a wound in the region of the great trochanter, at 9 p.m. the wound (which had been freely laid open) showed no signs of gas. In under ten hours, the man was dead, having suffered much agony; and the opposite thigh, which was uninjured, was blown up with gas to an enormous size.

The toxæmia is so fatal as to be unparalleled. Within a few hours of the onset of physical signs of gas, extensive gangrene may develop in the wounds, and life will hang upon the slender thread of an immediate and rapid amputation, with the minimum of shock.*

As the gas distends the fascial planes, pain becomes very severe, and the limb may swell to an enormous size, but with the onset of gangrene the pain usually disappears. The mental faculties may remain unclouded (despite profound toxæmia) on the very threshold of death.

When infection becomes general, on auscultation, gas may often be heard circulating in the heart, like the sound of a boiling kettle. This gives rise to great distress, and often to a sallow, contorted, almost tetanic facies. Extreme pallor is a marked feature of general infection. This may come on so suddenly as to raise the suspicion of internal hæmorrhage, and I have known a tourniquet applied to a thigh (where there was no wound of exit) until the diagnosis could be cleared up. A general infection is usually fatal from cardiac failure or gas embolism. After death not only the damaged limb but the entire body, including the great veins, liver, &c., may be distended with gas.

With this pitiful picture surgeons in France are only too familiar. Fortunately experience has taught that if the case is seen early the

*Intravenous ether anaesthesia is invaluable in these cases.

patient, if not the limb, can in most instances be saved. In the earliest stage, when the typical gas odour appears and a few bubbles can be squeezed from the wound, heroic incisions and the freest possible drainage, followed by constant lavage with sodium hypochlorite, will usually succeed; but if the case has come under observation when gas has begun to spread into the intramuscular planes beyond the site of injury and the limb has begun to swell, amputation is imperative. Any attempt to perform a complete amputation (that is, with flaps to cover the bone) must be made through uninfected tissues, which would not be possible in most instances, as the majority of these are thigh cases. Even when the conditions may appear favourable for a primary flap amputation clear of existing infection, nothing will be gained by this procedure in the great majority of cases, for the following reasons.

DISADVANTAGES OF FLAP AMPUTATION.

1. There will be less chance of ultimately saving the patient's life because there will be less chance of checking the infection.

2. There will be more chance of the patient losing his life at the time from shock.

3. For the amputation to succeed it will have to be performed as high or higher in the limb than the second stage of a primary flush amputation.

4. Healing by first intention cannot be expected. (The cases must be seen on the spot to appreciate this.)

5. The risk of secondary hæmorrhage (a very grave danger in these cases) is greatly increased. Since the routine adoption of the flush method we have had the good fortune to lose no case from secondary hæmorrhage following amputation in this hospital. The only death in this hospital from secondary hæmorrhage after amputation, during the last six months, occurred in a case operated on near the front by the flap method. Secondary hæmorrhage occurred during transit and again after admission to this hospital.

6. The need for re-amputation for sepsis or hæmorrhage may be expected at a time when the patient is unable to stand further operation, and often when there is *no more limb available* for an amputation.

It is announced that a serum against eruptive typhus has been discovered by Dr. Nicole, director of the Pasteur Institute at Tunis. Nineteen cases treated showed marked improvement.

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