

one. A man struck his leg against the corner of a box, causing a minute puncture, such as might be made by a tenotome, in a varicosity behind the knee. His fellow workmen tied a handkerchief round the thigh sufficiently tight to cause a venous obstruction, but did not apply any pressure over the bleeding spot. This was what they said they had been taught to do. By the time the patient reached the hospital he was acutely anæmic. I saw him immediately on admission; he was infused with saline fluid and recovered, but a month later he was still anæmic. There was no further bleeding from the puncture directly the constricting handkerchief was removed.

Quite recently two men were admitted to the hospital with superficial lacerated wounds about the elbow. With other men they had been lifting a large plate of glass which suddenly broke in pieces and cut them. A bandage was at once applied in each case above the wound, from which they continued to bleed severely and were both very anæmic on reaching the hospital. A careful examination under an anæsthetic showed that only the superficial veins about the elbow had been divided. Neither the brachial artery nor its branches had been injured. The effect of the bandages applied above the wounds had been to cause a forced venesection in each case, rendering infusion necessary. The anæmia markedly delayed healing. Similar altogether unnecessary loss of blood has occurred in cases of compound fractures. In the following one I believe the improvised tourniquet to have been the direct cause of the patient's death. A strong young man, aged twenty years, sustained a compound fracture of the lower third of the femur with protrusion of the upper fragment. There was no further injury, as the subsequent post-mortem examination showed; the popliteal artery and vein, also the anastomotic artery, were uninjured. Only the muscles of the lower third of the thigh, including terminal branches of the profunda artery and vein, were lacerated. Immediately after the accident a handkerchief was tied round the thigh above the wound and the man was carried straight to the hospital. I happened to see him as he was brought in. He was then absolutely anæmic; his blood had saturated all the clothes of the lower limb. The half-tight constricting handkerchief was

removed, and no blood escaping a pad and firm bandage were applied over the wound. He was then quickly infused with six pints of saline fluid, stimulating rectal enemata, injections, and drinks being also tried, but he died in about an hour. The post-mortem report says that the cadaver was exsanguine. Such a compound fracture without complications in a healthy young man is, of course, quite consistent with recovery.

The application of direct pressure is the proper first aid in all cases. The vast majority of such cases are superficial lesions of veins and small arteries. Supposing the much rarer instance of hæmorrhage from a large artery, the wound must be directly pressed upon or too much blood will be lost whilst a tourniquet is being improvised. First aid has been successfully rendered—e.g. by army medical officers—either by pressure with the bare finger or along with the interposition of a plug, directly upon the cut artery. It must surely tend to confusion if in an elementary ambulance class the teacher enters upon the subject of the circulation and the compression of the main arteries. One hears about ladies being taught to compress the femoral artery of a little boy, but are they told at the same time how difficult this would be to accomplish in an excited and restless adult—a muscular man, or fat woman!

When told to use improvised tourniquets is it explained to the class how tightly a surgeon has to apply an elastic band even on an unconscious patient to control fully the circulation? Supposing a tourniquet to be applied really tightly to a conscious patient, such pain is caused that the patient will wriggle and try to push the band a little lower down the limb, so slackening it. It may be argued that pressure should first be applied to the bleeding point and then an improvised tourniquet made to encircle the limb above. The most probable result, say in the case of deep hæmorrhage from a puncture or bullet-wound, will be to raise venous tension in the limb, and the blood being prevented from escaping by the wound it becomes widely extravasated into the limb and this may lead to gangrene and amputation. In conclusion, therefore, I desire to point out that instruction in first aid for primary hæmorrhage which does not put direct pressure upon the wound forward as

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