for these cases. The endemic focus of *A. perstans* infection noted above extends round the north of Lake Victoria and includes the Kampala area (Hawking, 1940). The cases described by Loewenthal had a verrucose condition of the feet, and Clark (1948) reported a series of elephantiasis cases with this verrucose condition from the area round the Aberdare Mountains in Kenya. There are no reports of *A. perstans* or *W. bancrofti* occurring in this area.

The velvety appearance of the skin was seen in many cases of elephantiasis of filarial and non-filarial origin. It is not regarded as a clinical entity (Strong, 1944), but appears to complicate elephantiasis of varied aetiologies. Jelliffe (1951) reported the condition in elephantiasis of tertiary yaws.

No detailed pathological investigations were possible in any of the cases, and no post-mortem material has become available for study. Until such studies can be made the true nature of the causative agent must remain a matter for conjecture.

Summary

A series of elephantiasis cases seen in an area free of bancroftian filariasis to the south-west of Lake Victoria is compared with a series of cases of elephantiasis of bancroftian origin. The possibility of these cases being due to *A. perstans* infection is discussed, and other reports of non-bancroftian elephantiasis in East Africa are noted.

Acknowledgments are made to the Administrator, East African High Commission, for permission to publish this paper.

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PROLONGED ACTIVITY AND MOVEMENT AFTER A PENETRATING STAB WOUND OF THE HEART

BY

J. DAVIDSON, M.B., Ch.B., F.R.C.P.Ed.

AND

F. S. FIDDES, M.D.

(From the Department of Forensic Medicine, Edinburgh University)

The traditional belief dies hard that penetrating wounds of the heart are necessarily fatal, either immediately or within a very short period of time. This does apply, of course, to many heart wounds, but surprising instances of prolonged survival and even recovery are by no means uncommon. Even when the victim is already dead when found, experience teaches the need for caution before it is accepted that death was necessarily rapid or that the individual must have been immediately rendered incapable of voluntary, purposeful activity.

The question is of practical importance from a medico-legal point of view, for if a person has remained capable of movement after heart (or other) injuries, that becomes a very essential factor in the proper reconstruction of events. It can explain an otherwise unaccountable or misleading discrepancy between the proved locus of an assault and the situation of the body when found. It may dispel or confirm suspicions of homicide, or provide grounds for a legal distinction between murder and manslaughter.

Case records illustrating these points will be found in various textbooks of forensic medicine, and they show clearly that a considerable range of activity is possible after penetrating wounds of the heart that are severe and ultimately fatal. Smith and Cook (1948) instance a man stabbed in the right ventricle who ran 18 yards (16 metres) before collapsing, and died six hours later; Glaister (1950) records the case of a young man, with a stab wound penetrating the left ventricle, who pursued his assailant for some 40–50 yards (37–46 metres) before collapsing and dying; Gonzales *et al.* (1954) quote the case of a man who, after being stabbed in the heart in the street, crossed the roadway and climbed two flights of stairs to his apartment, where he collapsed and died.

Along with such examples, the following case is worthy of inclusion because of the unusual extent of the victim's movements after receiving a severe stab wound of the heart.

Case Report

The stabbing occurred in the course of a fight between two youths outside a dance-hall. The weapon used was a small sheath-knife, having a single-edged blade only 2½ in. (6.3 cm.) long, with a maximum width of 7/16 in. (1.1 cm.), and a sharp dagger-like point.

The fatal wound penetrated the chest immediately to the left of the xiphisternal junction. The wound in the skin was ½ in. (1.3 cm.) in length, gaping slightly, and consistent in appearance with the passage of a single-edged stabbing weapon. The underlying wound in the chest wall, which cut through the seventh costal cartilage and adjoining muscle, measured ¾ in. (2.2 cm.) in length, and passed inwards, upwards, and medially.

Inside the chest, the wound penetrated direct into the pericardial sac and into the anterior wall of the heart. The stab entered the upper part of the right ventricle in front, and penetrated through the ventricular wall and through the anterior cusp of the tricuspid valve. The point of the knife had then passed through the valve orifice and pricked the wall of the right atrium without penetrating through it. The cut in the pericardium was 1 in. (2.5 cm.) long; in the ventricular wall and in the valve cusp it measured ½ in. (1.3 cm.). The total depth of penetration was 2½–3 in. (6.3–7.6 cm.), and the complete severance of the rib cartilage indicated the use of considerable force. The pericardial sac was full of blood, fluid and loosely clotted. No blood was present in either pleural cavity.

The time of the stabbing could be fixed with comparative certainty at about 12.20 a.m. A few minutes later the victim was seen lying on the ground at the locus and heard moaning by two women passers-by, who took no action, as they thought the man was drunk. Thereafter he got to his feet and actually exchanged a few remarks with a youth who had emerged from the dance-hall, and who, though he may not have known it, was a companion of his assailant. He then made his way unaided into and along a main street, where his progress was observed by three persons separately. One remarked that he was holding his stomach and walking in a bent attitude; another saw him leaning against a doorway for a time; while the third spoke of his unsteady and tired gait. All three assumed that the unfortunate man was drunk.

From the route taken and from a remark which he made to the youth mentioned above, it would appear that his intention was to make for the police station, situated 500 yards (460 metres) from the scene of the assault. It may be that he became mentally confused or simply that he was uncertain of its exact location, but, at all events, he went past the gate leading to the police station, and was found collapsed and unconscious on the pavement 100 yards (91 metres) further on at 12.45 a.m. He had therefore travelled unaided for a total distance of 600 yards (550 metres) in about 20 minutes.

He was carried on a stretcher to the police station, where he recovered consciousness sufficiently to give his name and address, and to say that he had been in a fight. He lost consciousness again in the ambulance conveying him to hospital, where he died, soon after admission and before any treatment could be contemplated, at 1.50 a.m.—that is, one and a half hours after receiving the fatal stab wound of the heart.

Discussion

In this case neither pleural cavity had been opened, and the external haemorrhage, though considerable, was not free. Death was due to cardiac tamponade. It is generally accepted that a rapid accumulation of about 400 ml. of blood within the pericardium is incompatible with life for more than a very short time. With free leakage of blood from any of the heart chambers, such a volume will accumulate rapidly. For this reason, any penetrating wound of the heart which gapes, or any penetrating wound of the thin-walled atria or of the intrapericardial portions of the large vessels, is likely to cause rapid death, either from tamponade action if the blood cannot escape from the pericardium, or from free haemorrhage if it can—for example, into one or other pleural cavity. Even so, the possibility of some activity exists, and Kerr (1954) quotes the case of a man who, after receiving a wound $\frac{1}{2}$ in. (1.3 cm.) long in the intrapericardial part of the superior vena cava, negotiated a fence and walked 30 yards (27 metres) beyond it before collapsing.

In the present instance, survival and movement were much more extended, and it must be inferred that the accumulation of blood in the pericardium was comparatively gradual. For this the explanation no doubt lies in the fact that the wound, though $\frac{1}{2}$ in. (1.3 cm.) in length, penetrated the thickness of the right ventricular wall in an oblique manner, so that a partial valve-like closure during systole might reasonably be postulated. Furthermore, the internal opening of the wound into the ventricular cavity was sheltered underneath the anterior cusp of the atrio-ventricular valve, and, although the cusp was also penetrated, this would still tend to minimize leakage even during diastole.

With these factors operating to slow the rate of haemorrhage, it is interesting to speculate on the victim's prospects if the stab had also established free communication between the pericardial sac and the pleural cavity. It is

doubtful whether his range of activity would have been greatly increased, but it is possible that his period of survival might have been prolonged, perhaps even to the extent of permitting successful surgical intervention.

In conclusion, it may be added that there is little doubt that the victim, from the moment he received his heart injury, was seriously shocked and weakened. The case therefore provides no evidence that a person so wounded might still be capable of strenuous exertion—for example, a sustained physical struggle—and we know of no case record which suggests such a possibility; but a person so incapacitated might still be able to discharge a firearm or use some other weapon.

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NURSING HOISTS

BY

W. RITCHIE RUSSELL, C.B.E., M.D., D.Sc., F.R.C.P.

AND

EDGAR SCHUSTER, O.B.E., D.Sc.

From the Department of Neurology, United Oxford Hospitals

The value of a lifting-aid for nursing purposes is most appreciated in the home where a severely disabled patient is being looked after by one person; but with the present-day shortage of nurses, lifting-aids may be of value also in institutions for the aged or chronic sick. There are certain manœuvres which involve an undue strain on the nurses or relatives even when the patient is not very heavy. These include lifting the patient between bed and chair or commode, in and out of a bath, and lifting up a patient who has slid from his chair to the floor. For home nursing a mobile and transportable form of lift is most useful.

FIG. 1.—Nursing hoist No. 4 (Fig. 1a). The hydraulic jack is being operated by the nurse's right hand. The patient illustrated has a spastic paralysis of both legs and the right arm. In Fig. 1b he is being lifted with two slings from the floor (or it could be a bath), and in Fig. 1c he is being swung on to a wheel-chair.