

MAJOR INJURIES

G. F. Abercrombie, V.R.D., M.D. (London)

*President of the College of General Practitioners
(Chairman).*

This morning we are going to talk about major injuries, and I hope that somebody will define this term. Obviously rupture of the spleen is a major injury; I suppose a fracture of the femur is a major injury. Is a walking casualty ever a major injury? There are severe injuries to the elbow in young children which may leave very serious consequences, and yesterday we were reminded that quite minor injuries may in the end prove fatal. I hope also that somebody will mention that, even if a person is not injured in a serious accident, the threat to life and the fear instilled into them will keep them talking about that accident for the next ten years, almost to the exclusion of everything else.

FIRST-AID AND PRIMARY CARE

W. N. Leak, M.D. (Winsford)

My talk this morning will be a complete contrast to that of Mr London which will follow. Whereas he will be telling us of the newest refinements of hospital practice, much of what I shall have to say will seem almost like turning back the clock. Circumstances alter cases, and while this is true of every accident, it is also true of the conditions in which we now have to treat them. In particular the ready availability of ambulances in most cases, and the possibility of sending—or even taking—a seriously injured person to

hospital has meant a great change from the old-time immediate treatment to the paramount importance of resuscitation if the accident is a really serious one. As a result, what a few years ago might have been considered correct treatment may well, in present circumstances, be far from the best. This is not without its dangers. A professor of surgery of international standing told me not long ago that, when he was in the south of England, he came across a road accident and did his best to render assistance. Later on he had to lose a whole day to go to the inquest, and was severely reprimanded by the coroner for the way he had treated the casualty. Many doctors must feel inhibited in the way they treat patients by fear of such ill-informed criticism.

But there are other dangers in treating major accidents. The circumstances themselves may involve physical danger to the rescuers, and if the general practitioner should happen to lose his life in the process—which is but the fulfilment of his professional duty—there is no pension or compensation payable to his widow or family. If he were in hospital service a pension would be paid, as of right, but all a general practitioner—or rather his surviving dependents—could do would be to ask the Minister of Health for a grant, which might or might not be given as an act of grace. This seems to me a gross injustice, and year after year I have brought the matter up at the B.M.A. Annual Meeting, but the Ministry are adamant. The matter was forcibly brought home to me when we had a serious train accident at Winsford over 20 years ago which resulted in 27 deaths. I was almost first on the scene, and some of the casualties were trapped under the locomotive which was blowing off steam in a most alarming, indeed terrifying manner. It was not pleasant attending to them, but it was not till afterwards that I realized that if the boiler had burst and I had been killed my wife and three children would have been left very badly off. As a result of my telling this story several times at the Annual Representative Meeting, the B.M.A. has itself now produced a really wonderful accident insurance scheme, much wider than I had envisaged, and the doctor who does not join it and pay £5 per annum for an accident cover of £10,000 almost deserves to get nothing.

What then are the circumstances in which a general practitioner can be called on to treat a major accident? For this talk I will define a major accident as one in which it is urgently necessary to get the patient treated in hospital. The most usual major accident today is met with on the roads, and this may involve one or many persons. It may be within easy reach of a hospital, or it may be in isolated moorland, snow, fog, or rain. All these circumstances will affect the doctor's treatment. Or perhaps there may be several

doctors present, called to treat a really major disaster, and here I would recall that in many parts of the country there is still no proper liaison between the general practitioners and the hospitals, another reform for which I have been pressing at B.M.A. meetings for the last ten years or so. I am glad to say that at long last there is quite a high-powered committee discussing the best organization to adopt. I will only say that broadly speaking the police are in charge of these operations and, though the police do not tell the doctor what to do, the doctor who does not work closely with the police is bound to make many mistakes and fail to utilize to the full facilities which are available. The fire and ambulance services can also be most useful, and though when ambulances arrive hospital personnel will probably also be on the spot, it is worth mentioning that in every ambulance in Cheshire there is carried a list of the hospitals in the area giving the number of casualties they might be expected to cope with, and even more important, a list of the hospitals specially equipped to deal with head or chest injuries, burns, and so on. In an emergency such information might prove invaluable.

If there are a number of doctors as well as a number of casualties, I am sure that it is a wise thing for one of the doctors—perhaps the first to arrive—to be put in charge to tell the others what to do instead of each doing what and as he thinks best. It prevents confusion and overlapping, and enables one doctor to report exactly to those who arrive on the scene later. This can save time as well as lives, and can smooth over the transition from one control to another, for the Government have laid down, I think very foolishly, that personnel from the hospital shall take charge as soon as they arrive, though it is probable that many general practitioners present will have had more experience of this type of accident than a fairly recently qualified hospital doctor, while they will certainly know much more of the local conditions which may have a profound bearing on the correct treatment.

So much for organization which, as I know from dire experience, is of great importance. Now as to actual treatment. Owing to the improved ambulance service this has, in most cases, greatly changed from what it was. Gone are the days when we used to try to set broken limbs on the spot. Indeed the first-aid we should render must often approximate more to that which is being taught in connection with civil defence, with its emphasis on the assessment of individual need, etc., rather than that which we are used to teaching our first-aid classes. It all depends on circumstances, but some first-aid rules still hold good—remove the patient from danger or the danger from the patient, check haemorrhage, ensure a clear airway, steady broken bones, and, if possible, prevent worse damage occurring.

To this we must add—do nothing avoidable which will complicate later treatment in hospital. This, I presume, is why I have been asked to speak before Mr London. Perhaps what he will say may modify something I have said, which will at least afford points for discussion, but I hope it will not be taken as showing any difference between us.

The attitude of the doctor is of utmost importance. Even in the midst of terrible confusion or appalling tragedy he must always assume an air of confidence, refuse to be flustered, and treat all patients with gentleness and sympathy. Sir Heneage Ogilvie once wisely wrote "Optimism is the greatest analgesic, hope is the most certain tranquilizer". The arrival on the scene of a doctor who is quiet, efficient, and obviously knows what he is doing, will do much to calm and relieve his patients long before he has time to assess their injuries or give them a dose of morphine.

The mention of morphia should remind us that it is often abused. It should certainly be avoided in head injuries and withheld, if possible, in cases that are rapidly going to be treated in hospital. On the other hand, where one is isolated and perhaps going to have to treat several casualties single-handed, one should be freer in using it. It is liable to be dangerous in shocked cases, yet severe pain can, of itself, cause severe shock, though not quite of the type which is mainly caused through internal or external haemorrhage. In some ways morphine mimics the effects of shock. It lowers the body temperature and may cause sweating. It certainly depresses the respiratory centre as well as reducing pain. Subjectively its greatest benefit is the contented euphoria it produces in most people, and if it is combined with hyoscine it can produce a most blessed amnesia, though I do not know that all doctors would agree with giving the two drugs together. Physiologically perhaps its greatest benefit is that in some way it reduces cellular activity and the demand of the organism for oxygen, even more than it depresses the respiratory centre. By quietening the patient it tends to reduce haemorrhage, and a severe injury probably travels a considerable journey more safely with a dose than without, and reactionary haemorrhage is less likely to occur. But many cases do not require large amounts, though the less severely injured benefit from fuller doses. I will just add that I hope no doctors will let themselves be caught, as I was in our train disaster, with plenty of morphia tablets but not enough fluid in which to dissolve them. Probably a supply of tubunic ampoules is the best way in which to carry this almost essential drug, which can be life-saving if wisely used.

Major accidents may, of course, be multiple not only in the sense

that there may be more than one person injured, but in the sense that the patient may have more than one serious injury. The major accidents we are most likely to have to treat are first of all extensive wounds, which are most often connected with machinery, falls or crushing, etc. Then there are extensive burns which are most likely to occur in the home, in motor smashes, and, especially, in aeroplane accidents, in which case more than one casualty will probably be present. Serious head injuries are met with above all in motor cycling accidents, while chest injuries are specially common and dangerous in motor accidents in which the sternum of the driver is staved in by the steering column. Abdominal injuries must always be looked for, as small wounds may penetrate with disastrous results, and internal organs may be ruptured with or without massive internal haemorrhage. We must consider fractures of the long bones, especially of the femur, injuries to the spine and finally any wound of a large artery. To make the list complete I should perhaps add poisoning, drowning and asphyxia, but these are rather specialized.

I need say but little about large flesh wounds. Where, as commonly, a large piece of flesh has been torn off there is little bleeding and a sterile pad or wound dressing is usually all that is necessary. The more one can exclude infection the better, for most hospitals can now produce plenty to trouble the surgeon.

In head injuries the most important point is careful watching. Concussion usually comes on immediately, and one must be careful to ensure a clear airway and if possible get someone to watch the patient continuously until he arrives in hospital. Cerebral haemorrhage with compression comes on more slowly; the state of the pupils is, of course, most helpful in diagnosis, but so too is a slow deterioration in the patient's mental state. For this reason, because very often it is a patient's total reaction which can give a danger signal rather than any particular sign, when dealing with several casualties a doctor should not just attend to the most obviously serious one. He should have a quick look at and, if possible, a cheery word with all, for one never knows what may be developing, and if one has no standard to start with it is impossible to notice changes which, to a practised eye, may show something serious, particularly, of course, in cases of internal haemorrhage. It may be that such a person will have a rising pulse rate, but you cannot go round taking the pulses of everyone in an accident, and a general practitioner ought not to need any such sign to spot that there is something sadly amiss.

Chest injuries are becoming increasingly frequent with motor accidents, and they are most important because in two conditions at

least prompt action may save lives almost more effectively than in any other condition. First, there is the case in which a number of ribs are broken in more than one place, with the result that respiratory effort simply moves this portion of the chest wall in and out, so that although respiratory efforts are made the actual respiratory exchange is very slight and death may supervene quickly. The obvious thing is to immobilize this loose portion of the chest wall, and this can be done by pressing on it with the hand and later bandaging over it a mass of something which will keep the injured part from moving. The other special injury is the valvular one in which air is sucked into the pleural space on inspiration but cannot get out on expiration. This may cause death by raising the intrathoracic pressure, and again the obvious treatment is to close the valvular opening, first of all by manual pressure and later on by a piece of sticking plaster, if there is nothing better available. The third most serious chest injury, which few people would feel anxious to treat *al fresco*, is haemopericardium. Here bleeding into the sac can cause pressure on the heart, "cardiac tamponade" as it is called. It can be relieved by aspiration through a needle passed upwards and backwards through the costoxiphoid notch, and this may have to be repeated. Surgical emphysema, which occurs quite frequently with chest wounds, is most alarming but seldom causes much danger to life.

There is little more that a doctor can do about abdominal injuries than what we are accustomed to teach in first-aid. If such an injury is likely, it is probably more important not to disturb the patient than to mess him about looking for trouble. A coroner may act like an examiner in first-aid, but we have a higher duty than satisfying coroners or even our own desire to make a firm diagnosis. The longer I live and practise medicine, the more convinced I am that it is not medically wise to disturb the position which a patient assumes unless there is some overriding and urgent reason. I am certain that many lives have been lost as the result of the injunction to "lay the patient flat". Unless you have experienced it, as I have, it is almost impossible to believe that a patient who is quite comfortable sitting up may feel utterly suffocated if laid flat. The reason for this is still obscure, but it is a fact of experience, and I believe that some deaths under an anaesthetic are probably due to this elusive mechanism.

With regard to fractures of the long bones the most important discovery of the past twenty years is the enormous amount of blood which may be put out of circulation, even when there is no external loss. It may amount to 4 to 6 pints, and I need hardly remind you that blood loss is the chief cause of surgical shock, or that if a

patient is allowed to become severely shocked even modern methods of resuscitation may fail to save his life. Therefore one must treat these fractures, especially those of the femur, with special care so as to reduce any further internal laceration which might set off more serious blood loss. One must remember, too, that fractures of the upper femur are often complicated by fractures of the pelvis, especially in motor accidents and crushing generally. Fractures of the acetabulum are not usually of immediate danger, but fractures of the pubic bones or of the brim of the pelvis are often associated with severe injuries to the bladder or other pelvic viscera. It is not usually possible to splint these fractures, though it would probably be a very good thing if every ambulance carried a Thomas' splint, for war experience showed how very useful these were if properly applied in enabling a patient with a fractured femur to travel in relative comfort and safety. Failing this the best thing to do is to bandage or tie the two legs together, and in most cases a small dose of morphine is useful unless the patient is to be taken almost immediately into hospital.

Fractures of the spine are always difficult, especially if there is any injury to the cord. The general opinion now is that it is wisest to treat and transport the patient in the position in which he is found, so long as he is reasonably comfortable in it. If he has to be extricated from wreckage this may not be possible, but the important thing is—as far as practicable—to move the patient as a whole and avoid any relative movement of one part of the body on another. He must be moved by a blanket or something else being placed under him and kept taut by as many helpers as possible. Where one can or has to make a choice of position, advocates of transporting in the supine rather than the prone position seem the majority, but in such cases the patient needs constant watching and his head should be turned to the side unless his neck is fractured. It is most important in this—as indeed in every case—to make sure that there is a good airway, and I need hardly remind you of the special difficulty if both sides of the jaw are broken, so that the tongue falls back and causes complete obstruction unless the patient is turned on to his face.

We now come to wounds of large arteries. In some ways this might have come first, but I have put it last in order that practically my last word might be about the importance of preventing blood loss. Resuscitation is the key to successful treatment of serious accidents, and the less blood lost the easier resuscitation becomes. Compared with this, almost everything else except keeping a free

airway is secondary. As a rule digital pressure will stop haemorrhage from most large blood vessels except the internal ones, and in some cases it may be almost—if not quite—the only way of stopping it. It must certainly be maintained to control the blood loss while preparations are being made for other treatment. This is usually by a pad with firm pressure, but there are cases, particularly if one has to deal with a number of casualties, where a tourniquet may rightly be used.

And now, to finish with, just one word on the free airway and artificial respiration. The American army, as a result of Korean War experience, has been doing some remarkable work on this, and they have produced a most striking film showing how essential it is that in an unconscious patient the neck should be fully extended and the jaw kept forward. The moment the head is flexed, even slightly, the airway becomes blocked. They have also shown how, if the head is kept in this position, mouth to mouth breathing is almost immeasurably superior to any other present method of artificial respiration. The film has caused a lot of controversy, especially the doubt it casts on the other methods. On the B.M.A. Science Committee and also at I.C.I. we have been going into the matter in some detail, and I must confess myself so convinced of the value of the mouth to mouth method that I have brought to show you a plastic tube which is being put out to make the method easier and more aesthetic to use. As you see, it can be used with one end for adults and the other for children. It is something which every doctor might well carry if he wishes to be able to treat any casualty with success.

I have, of course, only been able to touch on a few points, but I have assumed that we are all doctors and I hope that what I have said may be useful to refresh your memories or to provoke discussion—*which should result in action*. We have no time for arid discussion or debating points, for major accidents are a major hazard today, and it behoves all doctors to be wise to the best method of treating them, and not to be afraid of criticism.