Shock and Traumatism.*

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After the reception of an injury, generally immediately, occasionally after the lapse of days, or even weeks, there is found a state of nervous depression and physical prostration, known as *shock*. The symptoms vary greatly in intensity and duration, depending upon the extent of the injury, the vital resistance and mental strength of the individual, or the organs or tissues injured. The face is pale, hands and feet cold, with cold clammy perspiration (often confined to the head, face, or chest) and in extreme cases, much mental disorder and relaxation of the sphincters. The pulse is small, or weak and fluttering, and the whole condition may not inaptly be termed collapse. Cases have been observed in which comparatively trivial injury, or even simple mental impression – has been followed by severe shock, even death ; while in other cases the most serious accident may be sustained, with slight shock, or none at all. Indeed shock alone is often sufficient to cause death, and it has been noted, by competent observers, that in death on the gallows almost two-fifths die from this cause, dying even before feeling the constriction of the rope. In the worst cases the appearance of the patient is very like the collapse stage in cholera, or in fatal hæmorrhage. The temperature is much lowered, and is a highly important symptom, as a means of prognosis at least. A fall of a degree or more is dangerous, and WAGSTAFF, found that where the thermometer indicated a fall of 3·7° death inevitably followed.

Occasionally the patient will rally well, after an injury or operation, and after a time, day, weeks, or even months—sudden sinking will occur with all the worst symptoms of

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shock, the lips becoming white, face pale, extremities cold, and great disturbance of the heart's action. Persons of strong and robust constitution and vigorous mind, may disguise shock by a simple exertion of the will, as long as their bodily strength is unimpaired ; but when they become weakened by loss of blood or long confinement, there may be a sudden giving way of the vital powers. This is known as *remote* or *secondary* shock, and death is a very frequent result. We should make it a rule, therefore, to watch closely our patient who has had no primary shock, and by prompt treatment, even anticipating treatment—may ward off this most serious complication.

The question of operation immediately after an injury or during the existence of shock, is one of much moment, but our plan does not include its consideration. It may be noted here, that LISTER has shown most clearly, that chloroform is a stimulant, and its use will alone cause reaction. Further he has shown, and my experience has fully verified it—that in cases of organic cardiac disease, chloroform, so far from being contra-indicated, is the patient's greatest means of safety. Deaths on the operating table, but more particularly in the dental chair, have *all occurred after insufficient anæsthesia*, as not only must we have unconsciousness, but even suspension of reflex action. The temptation is strong to enter into this question at length, but it must be left to works on general surgery.

One of the most interesting facts connected with this subject, is that autopsy reveals no lesion sufficient to account for the fatal result ; in an immense majority of cases we find no pathological conditions that would be thought diagnostic, everything appearing perfectly normal. Undoubtedly is it one of those cases in which the mind is alone at fault, and death follows from suspension of nervous stimulus, whatever that may be. The examples of fatal issue from slight injury are too numerous and well known, to need any space here ; indeed the cases are not few in which death has followed

simple mental emotion, as extreme joy, grief, fear, etc. In this connection I wish to give a theory of the cause of death that was worked out by my assistant in the University, Dr. H. M. COREY, a graduate of our college therein. I shall use his language substantially: "The only change that autopsy reveals, is that the heart and large venous trunks leading to it, are engorged with blood; but the integrity of the structures is, to all appearances, unimpaired. The blood coagulates rather imperfectly, the clots being loose and dark, and sometimes it is entirely fluid."

"Where shall we look for an explanation? It is plain that the all-important organ is the heart, whose functions are seriously interfered with; we find it engorged with blood, as the venous trunks; and how could this occur, unless the heart's action were suddenly suspended? The action of the heart is automatic; it is not directly dependent upon the nervous system, but simply regulated by it. The heart will continue to act after the removal of the whole of the great nerve centres, provided the operation be gently and gradually performed." (We see evidence of this in death while under chloroform, the heart will beat for from one to four minutes after respiration has ceased). "Still further proof of this is, that even the mammalian heart will continue to best for some time after being removed from the creatures breast. The heart of a cat, after being divided into the one hundread and twenty-eighth part of its original size, will respond to a slight pinch of the forceps, or a prick with a pin, as I have myself demonstrated. This goes to show that its powers of action reside in itself, and only requires the presence of blood to stimulate it, and the nervous system to regulate, to carry on all its functions. The chief nerve supply of the heart is from the cardiac plexus, which is, in turn, made up of branches from the pneumo-gastric and sympathetic system. The only branches that are not derived from this plexus are, the left cardiac, which is a branch from the cervical ganglia; and the left inferior cardiac from

the pneumo-gastric; the heart is therefore supplied entirely from the vagi and ganglionic system. When we study the influence of these different sets of fibres on the heart's action, we shall see that they are very unlike indeed; for when we irritate the pneumo-grastic, the heart's action is diminished; while sympathetic irritation accelerates it. Now when the nervous system receives a severe shock, from any cause, it produces excessive nervous irritation; the primary effect being great stilmulation, which disturbs the equilibrium of the entire system; and allowing this stimulation to be equally distributed to the heart, by the vagi and ganglionic systems, it would seem, at first sight, that its action ought not to be affected in the least. But when we remember that the irritation is general, and that the irritation of the vaso motor nerves reduces the calibre of the blood-vessels, and in so doing accelerates the flow of blood to the heart without compensatory heart's action, the cause of death in shock is, I think, satisfactorily made out."

Treatment :—Mild cases of shock may often be successfully treated by what has been called *moral* methods; kind and reassuring words, in some cases, and harsher expressions in others. One thing is certain, in the case of hysterical or "nervous" women it is better to let them "have their cry out," as any attempt at suppression will only be followed by more trouble later, secondary shock. The surgeon must exercise his judgement, in deciding how to treat such cases, as harsh treatment might seriously aggravate one case, while very essential in another. In grave cases, one in which the condition approaches syncope, and quite prolonged, or with only slow, interrupted, or imperfect reaction, the prone position (dorsal) had better be assumed; brisk rubbing with the hand instituted, and the use of pungent stimulating applications. *Amyl nitrate*, by olfaction, is a potent remedy, and when accessible will always produce speedy reaction. In no case, however, no matter what the attending circumstances, may be, I would avoid the use of alcoholic stimulation, for

the succeeding depression will be quite dangerous, more so, in fact, than the primary shock. In cases of *profound* shock, with syncope, and prolonged unconsciousness, bleeding has certainly had surprising effects; certainly the flow of blood, as Dr. Corey has shown, will have some influence in overcoming the cardiac and venous congestion. The temperature of the body must be kept as near the standard as is possible, and all harsh treatment forbidden. Some of the methods used in asphyxia, particularly MARSHALL HALL'S, may be employed. When the patient is partially restored to consciousness, has not entirely lost it, remedies will materially aid, or alone produce reaction. Some of our authors give a long list for this purpose, but my experience, which has not been at all inconsiderable, suggests a small number. The indications will be given shortly.

A return to consciousness, or the establishment of reaction, is foretold by the temperature rising, the color returning, the pulse becoming more regular and stronger, the mind clearer, and the dorsal decubitus exchanged for some other position. Vomiting is quite a constant symptom of approaching reaction. Frequently the opposite condition may succeed, and we will have a febrile action of more or less intensity set up.

Arnica mon.—Wants the head low; diarrhœa with *involuntary stools*; involuntary urination; dizzy, with nausea.

Camphor.—Great coldness, *with hot breath*; hands and feet tremble on raising them; tongue trembles so he cannot speak.

Veratrum alb.—Cold as ice; *breath cold*; *tongue cold*; great weakness; distorted face; expression of terror.

TRAUMATIC FEVER.

Many surgical authors treat traumatic, or *surgical fever* as a distinct and peculiar disease, frequently describing it as one of a typhoid character, and indicating either maltreatment on the part of the medical attendant, or a depraved

condition of the system of the patient. Undoubtedly typhoid fever is the same thing, whether occurring in medical or surgical practice, except so far as the traumatic origin is concerned. The truth is, that this term is properly used to express a febrile reaction from pre-existant shock, and may be of any degree of intensity, or of any pathological character, dependent upon the general condition of the patient, and the surrounding circumstances. The worst forms of typhoid and typhus may thus appear, and need no special attention by surgical authors. In private practice, as a rule, the fever is not severe in form or intensity ; it is in old hospitals, where a tendency is noticed, in all cases, to erysipelas, gangrene, pyæmia, etc., that we have our worst cases. To a greater or less extent this febrile reactions is present after all operations, or accidents, being greater in proportion to the severity of the shock, and the impressibility of the patient.

The *treatment* is simple, and the indications, usually, readily met. *Acon.*, in ninety-nine cases out of a hundred will be all that is needed. When typhoid or other forms prevail, they must be treated precisely as if there was no question of trauma to be considered.

TRAUMATIC DELIRIUM.

Delirium, after operations or injuries, may be accompanied by fever or not. When it is of a mild character, a low muttering, or an apathetic condition, co-existent with shock, becoming more violent as reaction is established and the fever rises in intensity, the outlook is grave, as it indicates a profound disturbance of vital harmony. Persons of a highly irritable, nervous organization, or those of a broken down cachectic constitution, as well as habitual drunkards, are more prone to this variety than others. The delirium, in the latter class, so closely resembles delirium tremens, that, for all practical purposes, the conditions may be considered analogous,

The least dangerous form of delirium, is that coming on

only after reaction has commenced, rising or falling in violence, with the elevation and decline of the fever. Even this milder form is not at all times lacking in significance; if the accident has been severe, the shock profound, and the reaction rapidly brought about, it is to be expected, and will be of little moment. But under other and opposite circumstances, it is not without danger.

The *treatment* of Traumatic Delirium is purely medicinal and a simillimum will usually be found in one of the following:

Aconite.—Lamentations, anguish, despair; thinks he is going to die; fainting on rising up.

Belladonna.—Shining, sparkling eyes; red face; beating arteries merry (or melancholy); furious, *tries to escape*; wants the head high; burning heat with moisture; steaming heat.

Bryonia.—*Delirium about day's business*; faint and sick when sitting up; dark bloated face.

Cuprum ac.—Absent-minded; *staring*; fixed, sunken eyes; cold sweat; distorted, pale, deathly face.

Helleborus.—Taciturn, *sighing*; pale face; cannot think; general sweat.

Hyoscyamus.—Wants to go naked; *indomitable rage*; red, sparkling, staring, distorted eyes; blue face.

Ignatia.—Quarrelsome; *laughing and crying almost in the same breath*; impatient.

Lachesis.—Sad; loathing of life; suspicious and peevish; moaning and complaining; skin shrivelled and livid; nose, ears, and forehead cold; *as soon as he shuts his eyes he is delirious.*

Strammonium.—Furious rage; bites all that approaches him; *talkative*; convulsions; face is swollen and red; *expression of fear in the countenance*; staring, somnolent eyes; light, or glistening objects bring on spasms.