ON COMPOUND FRACTURE OF THE CRANIUM, WITH DEPRESSION.

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(*Concluded from page 709 of last Number.*)

CASE X. In that colony of filth and wretchedness, Kensington-buildings, the inhabitants of which have, for the most part, migrated from Ireland, a policeman informed me a fight had taken place, and that a man was very seriously injured. On hastening to the place, I found a man lying in a senseless condition upon the floor of a dirty room; and on examining his head, a contused and ragged wound in the scalp, leading down to a fracture of the parietal bone, with depression, presented itself. The injuries appeared very severe, the wretch who had inflicted them having repeatedly jumped upon the head of his victim with his heavy nailed boots. The hair was shaved from the side of the head on which the injury had been sustained, the wound carefully brought together, and the man laid upon his wretched bed on the floor. Whilst I was debating what ought next to be done, and considering the propriety of sending for a surgeon, that the trephine might be used, as the man still continued insensible, he exhibited signs of returning consciousness, and began to turn about on his bed; he slowly opened his eyes, looked round the room, and then was violently sick. He next asked, if the man who had injured him had been taken to the station-house. He was bled to eight ounces the same evening, and a poultice applied to his head, for the state of the scalp rendered it vain to look for union by the first intention; the treatment afterwards consisted in keeping the bowels well opened. Notwithstanding the age of the patient (46), the great depression of the bone, the frightful contusion of the integuments, and a constitution broken up by bad food and the worst kinds of intemperance (added to which, he was living in a room unfitted for the abode of a pig), this man recovered without a bad symptom.

[It may not be foreign to our subject, to pause a moment to remark how great are our disadvantages in treating patients in such abodes, and how great the evils of defective sewerage and of ill-ventilated dwellings to all classes of the community. In London, to which the operations of a recent Act are not applied, these abominations are, even at this moment, exerting their poisonous influences; and what I predicted¹ some years ago, has been fully confirmed by the localities in which malignant cholera has been the most fatal in its effects during the present visitation. Any one passing along the magnificent streets of the great metropolis, on either side of which are shops filled with every thing that can please the eye and administer to the luxuries of life, as well as to its necessities; any one looking on the moving mass of youth, beauty, rank, and fashion, by which they are crowded,—may fancy himself in some fairy-land; some land in which disease is never seen, and

¹ On the Necessity of Removing those Causes which Increase the Bills of Mortality. By J. C. Hall, M.D.; also, Letters to *The Times*, on the Causes Productive of Cholera. By J. C. Hall, M.D.

from which want, and sickness, and sorrow, have long been banished. Would that I could carry the young, the rich, the thoughtless, to some eminence, for one brief hour, and unroof some of the misery of which they know nothing! What would they then see within a few yards of that great highway—that stream of wealth and fashion? The abodes of poverty, disease, and death. These houses are unknown, save to the medical practitioner, the parish surgeon, the missionary of the Home Society, or the collectors of the pence men pay for living, or rather dying, in those miserable habitations. There, sources of fever and of cholera, though unnoticed by the rich and great, too surely exist. The rooms are never cleansed—the nature of their floors is concealed by layers of filth, often the accumulation of years; they are never lighted by the sun-beams; nor are they ever purified by a current of fresh air—for that which enters them is tainted by the heaps of decomposing animal and vegetable matters which surround such houses, “stealing and giving odours”. And yet, into such dens, from which the majority of the beasts of the field would fly, families consisting of ten or twelve human beings are crammed, and there perform all the domestic duties. Men, women, and children, there herd together; eat, drink, sleep, wash, dress, and undress, before each other; it is in such places that all ideas of decency, virtue, and morality, are broken down; that crime is generated, brought forth, and nurtured. There, too, the babe comes into the world without a blessing; and the old, grey-headed man passes from it without a hope. In such places, fever, which extends to the more favoured homes of the rich, is first engendered; for whilst the evil is unchecked, it is increasing. It is foolish to suppose, because the poor are the first victims, that the rich and noble do not suffer in their turn. Yes, it is in such places as these,—the intolerable filth and disgusting odours of which are unknown and inconceivable, except by those whom duty or humanity causes to visit them,—that the fatal seeds of diseases are sown, the fruits of which are most fearful to every class in this great kingdom. Can it be surprising, that in such lanes and back-courts, within a few yards of those noble streets adorned by splendid houses, and crowded with a living mass of beings possessed of all that riches can procure, fever and crime at present exist? And that this will continue to be the case is certain, until the knowledge of the evils thus occasioned shall have compelled their removal. This, we are told, is the seed-time of improvement; may the harvest be to us and to our children, under God’s blessing, most abundant.]

CASE XI. R. T. was knocked down by the horses of the Dart coach, in the streets of Kensington. When called to attend him, I found the patient in a house, supported in a chair, and a chemist, lancet in hand, attempting to bleed him; why, I know not, for the man was cold, pale, and pulseless. There was a wound in the scalp, and a fracture, with depression, over the frontal bone. He was put into a warm bed, and warmth applied to his feet; the head was shaved, and the wound carefully closed. It was twenty-four hours before he spoke at all; and for many days he could only articulate “yes” and “no”. When reaction came on, he was purged, and cold water applied to his head. It was three days before it was thought necessary to bleed him; eight ounces

were abstracted, which removed a fixed pain in the head. The man perfectly recovered.¹

CASE XII. A Frenchman, æt. 54, was admitted into the Hôtel Dieu, having received a blow upon the frontal bone with a stone, or rough edge of a brickbat. The scalp was much bruised, and a ragged wound in the skin led down to a fracture with depression. The injury had been sustained the day before ; but he could not, or would not, give a very clear account of the way in which he had met with the accident. He complained of much soreness in the wounded scalp, which was "*all he cared for*". He was quite sensible ; and there were no symptoms indicative of pressure upon the brain. Much against his inclination, he was bled, kept upon a low diet, and an aperient given every morning. When I left Paris the wound had healed ; and in a day or two I doubt not the man was in a condition to return to his ordinary occupation.

CASE XIII. A girl about fourteen years of age came under my care for a fracture, *with depression*, extending from the temporal to the right parietal bone, with a contused wound of the scalp. As there were no symptoms denoting pressure upon the brain, in accordance with the practice I have for many years followed, the girl was sent to bed, the room darkened, the head shaved, and kept cold with an evaporating lotion, the wound having first been very carefully brought together. It was afterwards requisite to take away a small quantity of blood, and to administer several brisk purgatives. She perfectly recovered ; a depression still remaining over the fracture, which could easily be detected.

CASE XIV. — was admitted into St. George's Hospital with compound fracture of the skull, with depression. The man walked to the hospital, and was perfectly sensible. Notwithstanding the absence of any symptoms, it was thought right to prevent any arising, by using the trephine. The operation was very carefully and ably performed by a gentleman, then one of the surgeons to that hospital, and the depressed portion of bone raised. The man went on remarkably well for two or three days ; he then had shivering fits, complained of great pain at the angle of the jaw, over the region of the loins, and in the knee-joint. He became jaundiced, and died. Secondary deposits of matter were found in several parts of the body.²

When I began my studies at St. George's Hospital, as the pupil of Sir B. C. Brodie, amongst a good deal of valuable advice dealt out in those short, pithy sentences for which he was so remarkable, and which were calculated to produce a lasting impression on the minds of his pupils, was a recommendation "*not to overlook the cut fingers, ulcerated legs, and broken heads*". Following this advice, and carefully observing cases of compound fracture of the bones of the head with depression, and the treatment adopted both in and out of the hospital, I very soon found that many cases died in which the trephine was applied, and that many recovered in which this operation was not performed ; and it will be remembered by many of my old friends and fellow-students,

¹ Mr. R. J. Pollock saw this case with me.

² I have given only a brief outline of this case, as I intend, on a future occasion, to enter into the consideration of secondary deposits of matter after injuries and operations. I will then transcribe the whole of this case from my note-book.

that, many years ago I ventured to *question the propriety of using the trephine in any case of compound fracture of the cranium, with depression, in the absence of symptoms denoting pressure on the brain.* This opinion was then regarded as a sort of presumptuous medical heterodoxy; and in the animated debate which took place at the Medical Society of the hospital, on the subject, with the exception of my old teacher and friend, Mr. Lane, there was hardly a student or a surgeon but insisted that the operation ought to be performed in all cases of this nature, whether symptoms were or were not present. Many cases which have since that time been published, and many others which have now been under my own care, and which I have seen under the care of others, during an active professional life, have convinced me fully, that many persons recover after their skulls have been fractured and a portion of bone depressed, without its having been elevated, even when a wound in the hairy scalp communicates with the fracture, and that the danger is much increased by the operation of trephining. The degree of pressure the brain can sustain, doubtless varies in different individuals: in some, slight pressure produces very great inconvenience; in others, the greatest depression is observed to occasion little or no uneasiness. It will also, in every case, be very necessary carefully to distinguish between the symptoms produced by concussion, and those depending on compression of the brain. This can, in most cases, easily be done, if some little time be allowed for the stupefaction, which a violent blow upon the head is certain to occasion, to pass away; and, as the effects of concussion gradually abate, a very little delay will enable the surgeon to ascertain correctly the precise nature of the injury, and to act accordingly.

After compound fracture of the skull, with depression, where the patient retains his faculties, all I have found necessary, is to order the wound to be very carefully closed. The hair should first be shaved off from the whole of that side of the head on which the blow was received, the wound washed, and if any splinters of bone be seen at the bottom of it, they ought to be removed, and then the edges must be gently and carefully brought together, care being taken to exclude every particle of air. The edges must be kept together by adhesive plaster, and supported by a proper bandage; cold water, an evaporating lotion, or ice, should be applied to the head. Rest, confinement to bed, purgatives with calomel, local and general bleeding, if required, and the strictest attention to diet, which should be the fever-diet of our hospitals, will of course be requisite; and any excitement, or any excess either in eating or drinking, must, for months after any injury of the bones of the head, be most carefully avoided.

If, after injuries of this nature, the patient remain in a state of torpor, the trephine must be used, and the depressed portion of bone raised; but, in the absence of symptoms of compression, this operation, in my opinion, ought never to be performed. That the elevation of the depressed portion of bone would be very advantageous and highly desirable in every case, there can be no doubt, if the operation were in itself unattended by danger; but let it be performed on twenty men in a state of health, and how many would survive the infliction? And I will here repeat an observation I ventured to make, six or seven years ago, in

the *London Medical Gazette*, when speaking of compound fractures of the skull and their treatment: *If the operation of trephining were in itself unattended with danger, that would be an unanswerable argument for its employment in all cases of compound fracture of the bones of the head, with depression; but this, unfortunately, is not the case.*¹ And more recently, I have had the pleasure of seeing this opinion confirmed, and in nearly the same words, by no less an authority than my old friend, Mr. Guthrie,² who remarks, "that if the operation by the trephine, or that of sawing out a piece of bone from the head, were not in itself dangerous, there could be no hesitation about its use; *but it is a DANGEROUS OPERATION.*"

Injuries of the head affecting the brain are highly important, both from the danger by which they are always accompanied, and the frequency of their occurrence. That the ancients trephined far too often is certain; while some surgeons, perhaps, in the present day, from witnessing the mortality by which the operation is attended, fall into the other extreme. The cases above mentioned as under my more immediate care, prove clearly that it would have been useless to have resorted to the operation in any of them, for they all recovered, which would in all probability not have been the case had the operation of trephining been resorted to; and they also go, in common with the numerous interesting recoveries which have been placed before the profession by Abernethy, Bell, Lawrence, Hill, Latta, Desault, Guthrie, and other eminent practitioners, to prove that the brain will bear a considerable degree of depression without injury; and when no symptoms denoting mischief are present, the employment of the trephine appears to me the most likely means of producing them.

After fracture of the bones of the head, it will be, as we have already observed, very desirable to direct our inquiries with the view of ascertaining whether the patient have continued in a state of insensibility from the moment of the accident; because there is, should this prove to be the case, reason for hoping that the symptoms are the result of concussion only. In the case of the little boy, Lec, though stunned by the blow, the brain gradually recovered its proper functions. Mr. P. (case vi, recorded in the last number of this Journal, p. 707,) remained insensible for a considerable time, until the side of his head was half scalped by the knife of the surgeon; and yet he regained his senses in time to prevent the completion of the operation, and lived for many years after the injury had been received. The effects of the shock the brain has received at the moment the fracture is produced, will gradually diminish, and, after a time, cease altogether. If, immediately after a fall or blow, by which the bones of the head are fractured, the man gets up and walks away, it is very clear the brain cannot have suffered from concussion; still, such a patient requires to be very carefully watched. The same man, in an hour (it may be more), often becomes drowsy, next, insensible—the alarming symptoms, which denote compression of

¹ Vide also Remarks on the Nature and Treatment of some of the more Important Diseases. By J. C. Hall, M.D. Second edition, pp. 158, 159.

² On Injuries of the Head. By G. J. Guthrie, F.R.S. p. 105.

the brain, having now supervened. There are cases, also, in which we find exhibited the combined effects of concussion and compression.

In many cases of concussion of the brain, I have witnessed the evil effects produced by the repeated abstraction of large quantities of blood. For example: a man falls from the top of a house, and fractures his skull; he is carried to bed in a state of insensibility, with coldness of the extremities, and a feeble pulse. By and bye he rallies, as was seen to be the result in cases *x* and *x1*; the pulse rises a little, and sensibility is partially restored; blood is taken away immediately; the pulse rises again after a few hours, and becomes a little fuller; more blood is taken away. And this practice is again and again repeated, until the patient sinks at once, or recovers only to be for weeks, months,—it may be, for the remainder of his life,—nervous and enfeebled. This opinion may not coincide with that of every medical practitioner; but repeated observation has led me to the conclusion, that concussion of the brain acts upon the system in nearly the same way as syncope, arising from pain, grief, irritation, or any other cause; and in the treatment of which, blood-letting would be the last remedy thought of.

“Immediate dissolution, like syncope, properly depends upon an affection of the brain, by the loss of a large quantity of blood, or even of a very small quantity in a constitution enfeebled by disease.” And if this opinion of Dr. Marshall Hall be correct,—and there can be no doubt of it,—the reason why the abstraction of even a small quantity of blood, at such a moment, may be productive of the most fatal consequences, will be evident; for the energies of the brain are considerably weakened, and its functions in part suspended, by the infliction of the blow upon the head.

Sir B. C. Brodie has pointed out, that, in some cases of concussion, death results from “some alteration or suspension of the action of the heart”; and we all are aware that sudden and violent impressions on the nervous centres, even though these do not occasion any perceptible breach of substance, frequently suspend, or altogether annihilate, the movements of the heart. Thus, in concussion of the brain, not only is there insensibility, but also a more or less complete suspension of the circulation, arising from failure of the power of the heart. This condition may be permanent, so that animation cannot be restored; or it may be temporary, as in an ordinary “fainting fit,” as it is commonly called. Cases of sudden death after violent blows upon the epigastrium, are very far from being uncommon; and the cause is probably the same, namely, from the shock being communicated to the extensive plexus of ganglionic nerves, radiating from the semilunar ganglia, and proceeding to the abdominal viscera. The contractile power of the heart may also be weakened to a dangerous extent, by other violent impressions on the nervous expansions: for example, very extensive burns in children frequently produce fainting, and even death, by the depression which they induce.

We are quite at a loss to account for the way in which a man, who five minutes before was in the possession of health and strength, and quite capable of bearing the evacuation of a large quantity of blood, becomes, by a blow upon the head, which does not even fracture the bone, unable to sustain the loss of one wine-glassful; and yet every one who has

taken the trouble to reflect on the cases of this nature which have come under his care, will be prepared to admit that such is the fact. It would be easy to enumerate numerous other causes of sudden suspension of the action of the heart; but they may all be traced to a violent shock to the nervous system, though we have yet to learn the exact manner in which these effects are produced. As yet, we know nothing! When the blow producing a fracture of the skull has been very violent, the patient, at first, lies quite motionless, the pulse is hardly to be felt, and the respiration almost annihilated. "He was taken up for dead", says the witness before the coroner, "a surgeon was sent for, who bled him, but he could not get much, only about a tea-cupful, and the man died soon after"—verdict, "*Accidental Death*"; nor does a month pass without a newspaper supplying some such information, and adding—"everything was done that medical skill could suggest"; and yet that very tea-cupful of blood may have held the balance of the scales in favour of life; for I have seen cases, even where bleeding has not been resorted to, and in the which partial reaction had taken place, but nature has appeared unequal to the effort, and life, like the flame of an expiring candle, after burning brightly for a moment, has gradually passed away. Would not "*Died from Bleeding*" have been a more correct verdict?

There is another practice equally common, and equally deserving of censure. I allude to giving brandy and water immediately after injuries to the bones of the head. At the moment after concussion of the brain, when all the powers of life are depressed, stimulants can never be employed with advantage; and when slight reaction has come on, the practice becomes very much more pernicious and indefensible. The fact that the heart and brain have sufficiently rallied from the shock to carry on the animal functions, proves that the administration of wine and brandy cannot possibly be required; and the making an unfortunate fellow-creature swallow brandy and water when in this condition, appears very likely to destroy life, even should he not be killed in the act of swallowing. It frequently happens, that some small vessel within the cranium is ruptured at the moment of the accident; and that condition of the system on which the feeble action of the heart depends, is calculated to prevent the ruptured vessel from pouring out its contents, and the longer this state continues, the less will be the danger of compression of the brain. At first, we can do little more in these cases than very carefully to watch the state of the circulation; and when reaction has fairly set in, blood must be taken away in sufficient quantity to prevent that immoderate hardness and frequency which the pulse has a tendency to assume after these accidents, when the first shock to the system begins to abate. But the plan of giving brandy to patients when in a state of insensibility, by which they may be choked, and of taking away blood the moment a pulsation is felt at the wrist, is yet far too common.

In cases of compound fracture of the cranium, in which, from the symptoms of pressure upon the brain, it is necessary to trephine, the proper period for performing the operation is a question of importance, and one on which, unfortunately, there is a difference of opinion. Mr. Guthrie thinks there is less danger on the first day; Sir P. Crampton

and Mr. Colles, that the operation on the first day only increases the irritation of the already severely injured parts. The case of the nephew of Lord Brougham, related by Mr. Crampton, bears upon this point, and proves that even fragments may be driven into the substance of the brain, without their immediate abstraction being required or warranted. I should most certainly advise the immediate removal of the splintered portions as a general rule, which will not be without exceptions; for in this case, the moment Mr. Crampton touched a large portion of bone with the intention of removing it (for the fragment was driven into the brain), the body became convulsed, and the unfortunate young gentleman moaned deeply; all further efforts were consequently desisted from; the case was left to nature, strict antiphlogistic measures being resorted to. At the end of twenty-two days the pieces of bone were discharged by the process of nature. The late Mr. S. Cooper has remarked, that "where the depressed portion of a bone is denuded by a wound in the scalp, a trial to raise it with the elevator *may* sometimes be proper, even though urgent symptoms of pressure do not exist; in such cases Sir A. P. Cooper sanctions the use of the trephine, but my own experience and observations would induce me to abstain from the operation."

The symptoms after accidents of this nature appear to vary, in some degree, according to the locality of the fracture; the upper part of the brain often bearing from the first a great deal of pressure with impunity, or becoming accustomed to it. It was the opinion of the late Mr. Liston, that in *punctured fractures* of the skull the trephine ought to be used in all cases, for "the presence of numerous sharp spiculæ from the internal table, for even a short period, is frequently followed by intense inflammatory action, propagated to the brain and its more immediate investments." The case of Ridley, Earl Spencer's groom,¹ the boy Lee, the woman struck by a brass candlestick, and the boy kicked by a horse in Smithfield (the two latter cases are related in the work of the late Mr. Abernethy), show, however, that in many cases of punctured fracture, the operation is not required. There is one symptom to which I would direct attention, which I have observed in two cases, both fatal, and which should always lead to an unfavourable prognosis—namely, a watery discharge from the ear, which, in all probability, comes from the sac of the arachnoid membrane, and is indicative of great danger. In such cases the direction of the fracture is towards the body of the sphenoid and over the petrous portion of the temporal bone.

CASE XV. December 1844. I was requested to ride over to Everton, with as little delay as possible, to visit Henry Barker, æt. 45. He follows the occupation of an engineer, and is a remarkably tall and powerful man. His habits are temperate; he is married, and the father of a numerous family. It appeared, that in doing something at the engine, his head had that morning been drawn into the machinery, and had become completely wedged between two pieces of iron, one of which had entered the back part of his head, tearing the scalp from the bone for more than four inches. There was a fracture, with considerable depression, which could be both seen and felt; it was more than two inches square, and that portion of the occipital bone was quite

¹ Case v, p. 706.

driven below the other parts of the skull. He was dull and stupid, but I learnt from a gentleman who had seen him from the first, that he was more collected than he had been an hour before; and that he seemed to be gradually regaining his senses. He was cold, and covered with a damp sweat, with a very feeble pulse, which could hardly be felt at the wrist. The edges of the wound were carefully brought together, and the patient kept in bed, the room darkened, and strict quietude enjoined. In the evening he complained of pain in the head and scalp. On shaving the head,—which I did not consider it prudent to permit in the morning, from the very weak state in which I found him,—the whole of the scalp on the posterior part of the head appeared much bruised and discoloured; thirty leeches were applied, and a bladder filled with ice and salt was suspended over the head. Ten grains of calomel to be taken at bed time, and an aperient draught the next morning. The next day it was necessary to direct twenty ounces of blood to be taken away, and three grains of calomel to be taken every four hours. The next day it was also necessary to take more blood; and two days afterwards he was again bled. The quantity of blood this man lost was enormous. He perfectly recovered; and to this large abstraction of blood, and the free exhibition of calomel, he undoubtedly owed his life. It will be quite impossible to lay down any rule, as to the employment of the lancet so as to suit every case: but it is well in the first instance to take only a small quantity of blood, and the quantity must be increased as urgent symptoms present themselves.

Some are in the habit of combining calomel with opium after injuries of the head,—a practice, to say the least of it, of questionable utility, except in those cases of mania which sometimes follow injuries of the head; it is then, if properly administered, undoubtedly useful, particularly if combined with small doses of emetic tartar in solution. When inflammation of the brain and its membranes have continued for some time, after the free use of the lancet, and the administration of calomel, I have often seen the application of a blister to the scalp, which should be dressed with mercurial ointment, afford considerable relief.

In conclusion, it is but fair to admit, that in the majority of the favourable cases of compound fracture of the cranium with depression, recorded by authors, in which recovery has taken place without using the trephine, the patients have been young; this has not, however, been the fact in the patients coming more particularly under my own observation. Having written to record facts, rather than to establish any theory of my own, it remains only to add my conviction, that in Compound Fracture of the Cranium with Depression, in the absence of symptoms of pressure on the brain, the dangerous operation of trephining is altogether uncalled for and unnecessary; and, in all cases, so hazardous an operation ought never to be resorted to without the most urgent necessity. "*Gravis tamen satis est operatio, et nunquam nisi indicationes adsint institui debet.*"

Sheffield, August 1849.