



Depressed Fractures of the Skull

(Notes of Cases)

With Remarks on Treatment

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Buckhaven

1886

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Of the various accidents of civil life demanding the aid of the Surgeon Depressed Fractures of the Skull may be ranked among the most unsatisfactory, in their Treatment and results. This arises from a variety of circumstances, such as the close anatomical connection of the bones of the skull with the Brain, rendering it impossible for the skull to be fractured, without injuring the Brain to some extent - the difficulty in each case of correctly interpreting the symptoms of the cerebral complications - the frequently fatal issue of the accident - and lastly the peculiarly insidious nature of the after consequences!

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Should the Surgeon not have the experience of the past to guide him, the contradictory nature of the literature of the subject revealing great diversity of opinion, and the apparently equally good results obtained by opposite lines of treatment, make it difficult for him to grasp the true principles upon which the treatment of such injuries should be based. Consequently when a junior Surgeon is called to a case of depressed fracture, he is largely thrown on his own resources, and often experiences considerable embarrassment in deciding on a definite line of treatment.

Having in practice met with 2 cases of depressed fracture which illustrated in a special manner the nature and course of such accidents I have been led to record them.

Case I.

Depressed Fracture of the Skull -
Concussion - Contusion of Frontal
Lobes - Sudden development of
Insensibility - Trerphuring - Cerebritis -
Meningitis - Hernia Cerebri -
Abscess - Convulsions - Death

On 11th October 1880. I was
called (10 P.M.) to see A - W -
14 years of age, who was reported
to have been struck by a stone on
the forehead and knocked down.
On arrival I found an incised
wound, immediately above the
middle of the left orbit, running
upwards and inwards, exposing

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the occipito-frontalis aponeurosis,
but not the bone. Closer examination
revealed a depression in the frontal
bone, apparently $\frac{1}{8}$ " deep, and an
inch long, but with no line of fracture
visible at the edges, the aponeurosis
not being divided.

There being no pain, and no head symptoms
of any kind, except a little giddiness
on sitting up in bed and trying to
read, expectant and preventive
antiphlogistic treatment was
adopted for the 1st week. Calomel, Saline pur
18th October —

Today, for the first time, the Boy complained
of headache - There are slight elevation
of both pulse and temperature and
head symptoms - Head shaved -
19th October

Was complaining of headache and

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Saline purgatives, cold to the head, & low diet were employed
while rest & quiet in a darkened room were adopted.

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pam at the wound - had vomited
during the night - Face pale,
Expression dull and heavy - Inclined
to lie and close with eyes half open
Tongue dry & brown - Temperature
rising Pulse 92 Weak and thready
20th October -

9 am Patient worse - Had vomited
much and retched during the night.
Face pale, Stupor rapidly increasing.
Pulse 96 Temp 101 Pupils dilated.

Strabismus present = 11 am. Insensibility complete.

After a Consultation, it was decided
to elevate the depressed bone. Making
a Y shaped incision and cutting
down to the bone, I found a gutter or V
shaped depression = ∇ in the
frontal bone, $\frac{1}{2}$ inch in depth. The
Trepaine was applied to the left of
the depression and a portion of bone removed.

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The dura mater, when exposed, appeared to be intact, and did not bulge up into the Trephine opening, while the pulsations of the Brain were distinctly seen. The left side of the gutter-shaped depression was ragged and irregular at the lower edge, which pressed against the dura mater, while the internal table to the right was broken and comminuted. The depressed bone was elevated and several pieces of bone were removed. A Ligature in the centre secured all 3 corners of the skin flaps, and carbolic dressing was applied -
i.e. a pad of lint laid loosely on the wound.

1
S.P.M. Consciousness regained.
Pulse 100 Temp normal. Pupils normal
strabismus gone. Tongue moist

21st October —

9 AM Improved — Ray answers readily
and cheerfully, but is inclined to
lie with his eyes closed and not
to look up. Wound washed out.
Tongue moist & furred — Pulse 90
Temperature, Pupils & Respiration normal.

11 P.M. Improved — Ray intelligent, no
pain — Taking nourishment, Milk,
Potash water etc Pulse 90, full & regular

22nd October.

Complaining of pain in head to-day
Face pale — Tongue dry brown & striped.
Wound filled with a dirty yellowish
matter — Washed it out with Carbolic.
Patient taking no support — ordered
a Beef Tea Enema which was retained

8
and 10 min. $\frac{1}{2}$ gr. Ammon. Aromat. = Pulse 108.

11 P.M. Temperature 103. Pulse 112 Weak & Very
Respirations 32 Heavy -

23rd October.

Improved - passed a fairly good night
voice stronger - beginning to notice
what is going on around him and
making remarks. Beef Tea Enema
and Ammonia continued.

Temperature 102.6 - Pulse 90 - Resps 22

24th October

Much improved - cheerful - had a
good night - wound fresh. Appetite
good - no thirst - All symptoms of
compression gone.

Temperature 99.4 Pulse 70, soft regular

7 P.M.

Very restless and complaining of violent
headache. Pulse 90 - Contrary to orders
had been given solid food, Coffee etc during

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during the day.

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25th October.

Rather quieter - had passed a restless night - Pain less - Bowels not moved

Temperature 103.2 Pulse 75 Very hard

26th October.

Lay quiet all night - now has no interest in anything - Anorexia
Constipation - Pupils dilated

Temp. 99.2 Pulse 66 Respiration slow & deep.

27th October

General condition the same - Mental
Hebetude - Taking milk freely.

Temp. 103.2 Pulse 76.

28th October

Stupor or lethargic state continuing
Anorexia - Thirst - Tongue dry, brown

Temp 103.8 Pulse 96 Pupils dilated

Respiration slow - Evidences of Compression?

10
29th October

Condition unchanged - To-day there appeared a small quantity of sloughy tissue pushing up through the Trephine opening Hemia Cerebri? Removed it.

Temperature 102.4 Pulse 80 Tongue dry - Had pain at occiput - Cold relieved him

10 P.M. Had a shivering to-day -
formation of Pus?

30th October

Condition the same - Tongue dry, tremulous.

Temperature 103.4. Pulse 80

Hemia Cerebri increasing.

31st October

Less Intelligent - Spoken to twice before answering to-day - First anorexia - Eyes & face suffused -

Temp 102 Pulse 66. Pupils dilated and oscillation of eyeballs.

11
Nov 1st

9 am Morse - had a bad night - was delirious and talked incoherently
Today Boy has difficulty in understanding what is said to him - Aemia increasing
10 P.M. Condition worse - Twitching and spasm of muscles generally, dilatation of pupils and oscillation of eyeballs.
His talk is a confused unintelligible jargon.

Temp. 101.6 Pulse 78.

Nov 2nd

Comatose - Muscular twitching on right side only, and Paralysis of left side - Oscillation of eyeballs - Pulse very weak & quick

Nov 3rd

Comatose - Heart's action tumultuous -

172
Teeth locked - Eyeballs oscillating
and glazed - Hernia Cerebri
being no larger it was cut
off at level of skin -

Temperature 101.6 Pulse 152 Respiration 32

Nov 4th

Coma less pronounced - spoke
during the night - Taking Beef
Tea, milk and ammonia per mouth
Temp 101 Pulse 132 Respiration 27

Nov 5th

Appears better - Put his tongue
out when asked - Tongue and
lips dry - Paralysis and
convulsions continuing

Temp 101.2 Pulse 132 Respir 32

Nov 6th - Died Convulsed at 1.15 AM

13
Post-Mortem - 8th Nov.

From notes at the time the following paragraphs are extracted:—

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On opening the skull the dura mater was found highly congested and firmly adherent to the roof & floor to surface of the Brain and its vessels swollen and turgid.

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On removing the dura mater an Abscess containing one ounce of Pus was found in the anterior lobe of the left hemisphere corresponding to the seat of the aperture in the frontal bone, and two ounces of bloody serum in the base of the cranium.

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& floor of the Cranium. The Pia Mater was slightly adherent

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On slicing the Brain substance from above downwards, a quantity of serum was found in the lateral Ventricles, and about 2 inches of the anterior lobe of the right hemisphere were broken down, and in a state of softening. The posterior portion of the Cerebellum was covered with pus, the vessels of the Pons Varolii and Medulla oblongata were congested, and a few bloody spots (puncta sanguinea) were observed here and there throughout the cerebral substance.

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No fracture could be detected at the site of "Contre-Coup" or at the base of the Cranium.

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Remarks

In looking over the facts of this case it is instructive to note the number of points of importance in the Symptomatology and treatment of Head Injuries illustrated by it.

a. Symptoms

1. It is an illustration of how insidiously the symptoms of Brain Injury develop — Here nothing appeared at the time, and days passed without anything obtrusive to lead any one, unless a skilled observer, to suspect serious cerebral injury. Yet the p. m. revealed severe contusion of both Frontal Lobes.

2. This case illustrates the Functions

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of the Anterior or Frontal Lobes.

That at first there were no definite head symptoms, nothing but a vague indication of cerebral injury, is quite in keeping with the results of recent Research on Cerebral Function, Ferrier having shown that the Frontal lobes are concerned neither in motion nor sensation, but are intellectual in function.

In this case, in the earlier stages, there were no symptoms indicating interference with motion or sensation, but there was a marked mental apathy evinced by the patient all through. This gave a character to the case as a whole; when spoken to, the patient

answered intelligently, but immediately lapsed again into his lethargic state, until roused. ~~again~~. This symptom has been noted before.

3. It may be taken as an illustration of "Contre-Coup." Why both ^{frontal} Lobes should have been bruised so much may be explained by a statement made by the lad on my first visit - viz. "I fell on the back of my head" but at once got up." It affords a good illustration "of how suddenly complete coma may supervene."

This sudden onset of insensibility was perhaps the most striking feature of the case. The effusion of Serum in large quantities

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Ferrier's - localisation of Cerebral Disease

pp. 31-34-38

is not uncommon after head injuries, in connection with inflammation: but it may occur suddenly, as here: In this case in about 24 hours from the first signs of stupor, "complete" insensibility supervened. This intra-cranial pressure giving rise to coma led to the Trephine being used: and the complete success of the operation (as far as relieving compress-
 was concerned) favours the idea, that the removal of depressed bone reduced the fluid pressure within the cranium sufficiently to permit of equilibrium being restored.

Holmes System of Surgery - Vol 1 p. 623.

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5 The inflammatory symptoms were
At first the inflammation
came on insidiously, but
in the later stages the
symptoms were well marked.
The oscillation of the eyeballs,
the delirium, the general
muscular tremors followed
by hemiplegia, the coma
etc were all thoroughly
characteristic.

The inflammation appears
to have culminated on
October 28th = 17th day =
Temp 103.8 Pulse 96. Next
day the Rigor occurred,
then the Temperature and
Pulse both gradually
fell until immediately
before death, when the
pulse rose greatly.

were characteristic."

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This steady fall of both pulse and Temperature after Rigors accords with the recognised symptoms of cerebral abscess - thus

- a a subnormal temperature or at least a not elevation
- B A slow pulse (Fall to 66.)

During the last few days of life Nature seemed, as it were, making an effort at recovery. The lad regained consciousness and the use of speech slightly: while the hernial protrusion ceased to increase. Was the pus getting encysted or had it stopped accumulating? The intra-cranial pressure evidently was lessened.

Ashurst-International Encyclopaedia of
Surgery Vol V p. 86
Holmes Vol I. p 628.

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B-Treatment

The treatment also in this case is worthy of notice. In the earlier stages, as far as the use of calomel, purging rest etc were concerned, the treatment was conducted in accordance with those general principles on which all Surgeons seem agreed, and calls for little remark.

After Trephining, the external wound, was treated on general principles, but the interest of the case attaches itself to the "operative measures employed. In reviewing this point we may range our remarks under 2 heads, and then consider the treatment of depressed skull fractures generally.

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I = Was the Trephine called for in this case and when should it have been applied.

According to Authors quoted pp. 27-31 there being "no symptoms" the Trephine was called for, not at first but later on, when symptoms became "urgent".

My only regret, on looking back on the case, is that the Trephine was not resorted to earlier. Although this case could hardly be called a "punctured" one, (it being more gutter-shaped,) yet the condition of the internal table was identical with what is found in "punctured" fracture i.e. splintering and depression of the broken fragments. This being so, the dura mater and Brain

were constantly ^{irritated} by being thrust against the rough edges of the depressed fragments of bone, during the normal pulsatile movements. Further, the part of the Brain most disorganised, viz- the left Frontal lobe, where the pus formed, showed, I think, the influence exerted by the depressed in "goadiing" on, as it were, the part beneath to inflammation. Had the depressed bone been removed early, the reaction after the Concussion most likely would not have been excessive and the inflammation and abscess averted. When the Trephine was employed, it resulted in no permanent good - it removed

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the depressed specula, but did not check the inflammatory process which had gained a firm and sure hold of the tissues.

II =

After Rigors had indicated the formation of Pus, should there have been any other operative measures attempted?

Should I not have made an incision into the brain substance, and discharged the pus, and thereby have given the patient what slender chance he had of recovery?

Under the special circumstances of this case such a proceeding would, I think, have been doubtful practice. The symptoms throughout had indicated a

process

there have been

Potts "Observations on Injuries of the Head" 1768
page 248. "Division of the dura mater is
"an operation which I have several
"times seen done by others, and
"have often done myself".

"generalised" rather than a "local" injury, and this fact rendered operative measures uncertain for the Brain could not have been remedied as a whole by operations on one portion only of it. The history of the Case, the long continuance of inflammation, and the left hemiplegia pointing to lesion of the right Brain, a part far away from the Trephine opening, all negatived the incision. Had the hemiplegia been on the "right" side and so given grounds for supposing that the Brain lesion, although desperate, was mostly on the left side, incision might have been resorted to as a "dernier ressort." As it was nothing was done. The extensive disorganisation

of the Brain' revealed by the P.M. showed that it could not have given more than temporary relief. For the sake of contrast and for brevity to refer to one case only - that of Dupuytren's we will see that the fact of the general condition of the patient having been good, the head symptoms of short duration, the lesions local, and the paralysis having been on opposite side of body, all combined to place it in a different category from this one.

III - What is the appropriate Treatment of Depressed Skull Fractures generally.

This is one of the most debated points in Surgery. Before

'Holmes System of Surgery Vol 1 p. 627.

stating my opinion as to the treatment of such injuries we may note first the views of Authors on Treatment and then examine critically the principles so laid down. For the sake of brevity, we quote only a few writers, and only as much as will make their ~~own~~ views clear.

(1) Pott = Observations on the Nature & Treatment of Injuries to the Head - 1768. page 130

Perforation is absolutely necessary in 7 cases out of 10 of simple un-depressed fractures of the skull

2) John Abernethy -
Surgical Observations on Injuries of the Head
1815.

pp. 33-4.

There are doubtless some depressions of the skull that it would be absurd not to elevate by an immediate operation, for in them the pressure on the Brain would of itself be productive of fatal Consequences.

The argument against the immediate operation, applies only to those dubious cases, in which perchance upon the subsidence of the inflammatory symptoms, the pressure may be found not to be so great, but that it may be borne without detriment, though there is a risk that it may be detrimental.

This lays down no definite principles -
It is expectancy or waiting to see
what course symptoms will take.

(3) Guthrie in 1847. says

The rule of practice is at present decided that no such operation should be done until symptoms supervene, distinctly announcing that inflammation, compression or irritation of the brain have taken place.

H. Bryant's - A Manual of Surgery
Vol. 1 p. 228.

a In simple un-communited depressed fracture, from a local injury no operative interference is called for unless associated with marked symptoms

b In Compound Communited depressed Fracture and in "punctured" fracture, with or without symptoms of Brain Compression, elevate and remove all fragments.

To wait, as here recommended,
until inflammation has set in,
is to wait until the mischief
is done. Removal of bone fragments
won't cure inflammatory process

This makes the matter turn on "Symptoms"

The extent of the depression as a measure
of the damage to the Brain beneath is
not referred to here.

Grichsen Vol. 1. p. p. 432, 3 (6th edition)

a In simple depressed fracture without symptoms, will not dogmatise, under certain circumstances should not interfere. If however Surgeon should suspect splintering of inner table - operate.

b Compound depressed skull fracture - never saw a case recover without operation.

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Holmes System of Surgery - Vol. 1. p. 583. (2nd Ed.)

A Simple depressed fracture without symptoms - Leave alone. If symptoms be "urgent" = operate.

B Compound depressed fractures must frequently lead to intra-cranial suppuration as demonstrated by Sir Astley Cooper and Sir B. Brodie hence operate at once to prevent the impending mischief.

(3rd edit)

There is no attempt here to point out why
such cases are so dangerous -
It is simply experience has taught that
such cases lead to suppuration.

On looking over the principles of treatment here laid down, it may, broadly speaking, be remarked that treatment was made to turn either ^a on the presence of urgent symptoms denoting compression, irritation or inflammation of the Brain, or ^b on the fact of the fracture being compound and comminuted.

a—thus as we have seen Abernethy, Guthrie, Bryant, Holmes, etc all make symptoms the basis of interference in simple cases, without any special reference to the conditions of bone which caused the symptoms after fracture, i.e. whether fragments were crushing down on Brain tissue or not: while in compound cases

there is a unanimity in recommending operation, although some surgeons such as "Dr. Drutt", recommend operation, "only" if there be "symptoms."

This making of "Symptoms" the vital consideration in determining the treatment of such injuries is to my mind very unsatisfactory.

In many cases which afterwards terminated fatally no symptoms could be detected at first. Thus in the case quoted symptoms were latent or absent for a time, and nothing being done, the inflammatory process had full opportunity to get a secure hold on the tissues.

This waiting for "Symptoms" I consider wrong in principle.

Smith's Surgery p 334.

and in practice, - it reduces the Surgeon's art to low level as it is fact a "do nothing" until urgent symptoms come on, after which it matters little what measures be attempted.

In short, waiting for symptoms does nothing to avert the dangers and complications of the injuries in question.

Further, looking more to the effects or of the Brain injury than to the cause of them, it takes no note of the extent or character of the bone depression and what organ damage that may have done the Brain. These really being the considerations which should determine treatment.

B = The fact of a fracture being

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Compound and comminuted may be made a good test for the determination of Treatment. The presence of a wound, owing to the general use of antiseptics now, adds little to the gravity of a case, although comminution of bone does - It presupposes fragments driven into the Brain.

This matter then being a controverted one (there being on the part of Surgeons at the present day an inclination to adopt other methods of Treatment) I would venture to make the following suggestion. Instead of a "Symptomatic" test for the determination of treatment, I would substitute an "Anatomical" one. Instead of taking symptoms as a test, I hold that the

Surgeon should rather consider what is really the essential fact in depressed fractures viz—

"What is the new relationship" here induced by the fracture "between the bones of the skull" and the cranial contents"

and as a corollary to that—

"Is this new relationship of" "Bone and cranial contents" "compatible with Brain health" and safety to life in the future."

I—In support of the above statements, let me refer to some points in connection with the structure of the bones of the skull, which may throw light on the matter.

In the bones of the skull, there are the outer and inner tables, and the diploe to be considered.

The outer and inner tables may each be fractured without the other being injured. Thus the outer table may be driven into the diploe and the inner remain intact' or the inner table may be broken and splintered without the external table being injured at all.

Further, Authors state that depression of the skull without fracture cannot occur in adults.

Consequently if there is fracture in every case of skull depression, no depression of the external table greater than the thickness of the diploe can exist without involving the inner table as well, as it also becomes depressed correspondingly and therefore fractured. Also, when fracture of both tables - with depression -

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1 Agnew - Principles and Practice of Surgery - Vol 1 p 462

2 Edinburgh Medical Journal Vol 8 - p 191 - Mr Edwards Case

3 Agnew p 272. Bynant Vol 1 p 201 - Holmes Vol 1 p 582

pression -

occurs, the inner table suffers or is splintered more than the outer one. All writers state this. The reason of this greater splintering of the internal table is explained by Teevan (in Brit & For. Med-chir. Review July 1865 p 193) - thus

Comminution of the internal table is explained by a well known physical law:

"Fracture commences in the line of" "extension not in that of compression."

This being so (if we except those cases of slight depression in which the external table is merely driven into the diploic structure) every case of considerably depressed skull fracture has spicula or fragments of bone in contact with the dura mater - whether merely in contact with it, or projecting downwards

✓ Eriksen Vol 1 p 428. Agnew Vol V p 271. Ashhurst Vol
p. 50

on it and causing irritation only, or penetrating the dura mater and lacerating or tearing the cerebral cortex, depending on a variety of circumstances.

Lastly this may be case, although the condition of the external table might lead one to infer that only a very slight injury had taken place.

These conditions then, or this relationship of the spicula of the internal table to the cranial contents after fracture with depression, appears to me the essential fact or element in such cases, while the presence or absence of symptoms, at the time, is of much less importance. In short, the condition of spicula

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Edinburgh Med. Journal vol 8 p191. - Ashhurst p. 22.

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of internal table determines the danger or gravity of the case. (If we examine the smooth vitreous surface of the internal table, we shall see that perfect smoothness of surface is nature's arrangement for the maintenance of health.) Consequently it is the damage which the broken and depressed fragments inflict on the cranial contents that render such injuries of so great importance and interest.

II = "Is this new relationship of Bone and cranial contents compatible with Brain health and safety to life in future?"

This question springs naturally from the previous proposition, and is a most important one

If it be immaterial, whether depressed bone (spicula) be left in situ after fracture, if only "no symptoms" be present, the older Surgeons were right in basing their treatment on symptoms but if not, then there is something amiss in such principles.

The question is "what are the "patients prospects of Brain health" "for the rest of life if nothing" "remedial be attempted."

If the Surgeon can say this lesion will not affect the mental condition of the patient in the future, nor interfere with the discharge of nerve function, then any operation is improper: but if the Surgeon can't say so, and it seems probable that at some future time the patient

may become more or less impaired mentally, or his life become endangered, the removal of splinters is the duty of the surgeon. The immediate recovery does not always end the case.

For the reasons stated then and for the purpose of ascertaining the nature of the fracture is the extent depth and character of the depression, whether it is starred, comminuted, gutter-shaped, punctured, etc. I would therefore recommend, that an incision, in simple cases, be made down to the bone and exposing the fracture. In compound cases, if necessary, the wound should be enlarged

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to permit of a thorough examination.
This proceeding would go far to
enable one to form a trustworthy
opinion, as to the condition of
affairs, and whether operation be
called for or not. It is true
we cannot determine positively
what the inside of the skull
cap is like without operation,
but remembering the facts
about splintering of inner table
as before stated, a good and
fairly accurate opinion may
be formed, as to whether the
existing depression, taking into
consideration its amount, extent,
depth and character, is likely
to result in serious consequences.
The danger attending such an
incision is little - antiseptics having minimized
it.

'page 38

or whether it be desirable to leave it alone.

44
The operator could then examine carefully and decide on what further treatment was necessary. This done in all cases would, in my opinion, ultimately save many lives, because no longer waiting for symptoms and groping in the dark as to the conditions and relations of the bony fragments, measures could be adopted at once, in cases requiring it, to ward off inflammation, and that to with a much better chance of success than if the parts were already inflamed. It would obviate bad consequences when possible, and not leave matters to take their downward course, which is practically what occurs when a case is "left to nature".

1
It may be urged that this procedure renders cases compound i.e. a simple depressed & comminuted fracture becomes a compound depressed & comminuted fracture & so requires treatment. To this I answer that the reason for operation lies not in the fact of a wound being present but in the fracture being comminuted and depressed i.e. bone splintered & thrust down into cranial cavity. The incision only brings mischief to light.

45
If the depression be considerable in depth, limited in extent, and have edges sharply defined, we have a condition of external table

entailing a corresponding depression and fracture of inner table; therefore bone should be elevated or removed. Remembering the serious nature of Trephining, it would be advisable to employ the elevator, forceps, Key: Saw etc where possible: but if fragments cannot be replaced or withdrawn efficiently, the major operation must be resorted to.

Should inflammation and abscess follow operation, as in case quoted, division of dura mater and evacuation of pus, if practicable, would be proper. Recovery might follow.

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If the depression be flat slight and of considerable extent, it may be advisable to proceed no further, but any condition involving pressure on the Brain is injurious — (~~See case 3.~~) page 55

In connection with the views stated in the preceding pages, I may say that they are supported by the history of cases observed.

From the records of surgery cases may be cited to show that depressed fractures "left to nature," on the ground of no primary symptoms having developed, result in serious cerebral lesions and functional disturbances.

Almost all forms of nervous disorder have been stated to result from such cases - viz -

1. Inflammation from slight causes (Case II)
2. Epilepsy
3. Mental Defects - impaired memory etc
4. Derangements of muscular system -
spasms, Cramps, Numbness etc
5. Insanity
6. ~~Aphasia~~ etc. etc

(For Cases see appendix)

But the question arises does every case so "left to nature" result in consequences as stated.

On this point it is not safe to dogmatise, because as Abernethy says "it cannot be ascertained" "but by a continued acquaintance"

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— page 14. - Abernethy's Observations

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"with the person who had received
the injury" and the Literature
of the subject gives no information
on the point. Reasoning however
from history of cases, and the
results of scientific Research it
is unlikely that a person
will remain the same, in after
life, with fragments of bone
encroaching on the cranial
cavity.

Lastly - To epitomize -
In every case make out satisfactorily
the relationship of bone fragments
and intra-cranial contents -
if necessary, expose the seat of
fracture by an incision - if
depression be limited in extent,
deep and with sharp edges -
operate - sulder measures first,

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which failing the more severe -
If depression be slight, flat
and extended - Watch -
If operation be decided on,
let it be done early.

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Case II

When visiting professionally met Thomas Robertson, aged 85. the subject of a large depression of left parietal bone, at superior posterior angle. The depression looked exactly like the indentation which a tablespoon would make, if pressed down on wax, or other soft substance. At the end where the greatest depth was, the upper and lower edges were sharply defined, while the bone depressed gradually rose to the other end, exactly as the bottom of a spoon tapers away to the point. Length of depression $2\frac{3}{8}$ inch, breadth 2 inch, depth $\frac{5}{8}$ of an inch. I was informed that 9 years previously he had fallen into hold of a ship,

and struck his head on ballast
at the bottom - was unconscious
for 15 minutes - assisted home - was
an invalid for a month - then
perfectly well, and had remained so.

1st Feby. 1886 - called to see above.
There was a history of complaint ^{for}
of cold, and Rigors, then gradually
increasing weakness and stupor.
Found him in condition of stupor; he
seemed to have some faint idea
when spoken to loudly, or rudely
shaken - face pale - Temperature
subnormal - pulse full & slow 36.
no sterlor, pupils contracted.
To see if the depressed bone was
still loose or movable, (there being
a wide separation at deep end between
bone depressed and edge of skull,
not admitting of bony union)

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I made very firm pressure in the hollow and elicited the following phenomena:— general muscular contractions came on— the arms were drawn upwards and outwards from the side slowly and steadily— the legs were drawn up slightly— body rotated from right to left— slowly, while facial muscles were set in action— a sardonic grin overspread the features, giving one the idea of pain being felt.

Repeated pressure evoked movements almost identical—

2nd Feby. — Stupor continuing, Temperature markedly sub.

3rd Feby

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4th Feby died to-day —

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Weakly subnormal - Pulse 36 full - Respirations 2 - In Extremities - Pupils
Contracted

Remarks-

I - From the symptoms here presented we may remark that this was a case of Cerebral Abscess.

The symptoms of Abscess are vague and indefinite, but there are two of great importance, a slow pulse & Subnormal Temperature - Both these were present in this case, and taking them into account, after the Rigors, and with the general history of the case, I think the diagnosis of abscess fairly well established.

The patients advanced age was urged against anything being done, such as an attempt to relieve the brain pressure by elevation of bone.

II - It may be remarked that the Phenomena observed agree with the results of Ferrier's experiments. The depression being situated about over the upper end of the Fissure of Rolando, over the centres for the upper and lower limbs, the movements observed may be taken as the result of irritation of those centres by pressure.

The sardonic grin referred to, was, no doubt, caused by pressure, radiating to centres for muscles of mouth and cheek.

No P.M. being made, the diagnosis was not verified; but I have recorded the case for 3 reasons

1. To show to what extent the skull may be
2. To show that although 9 years ^{had} elapsed since in
3. As tending to prove the theory of cerebral loc

may be depressed, and yet no symptoms be developed at the time
since injury, this patient at last died with the signs of cerebral
abscess localisation.

Case III

J. J. L. 29, is the subject of a flat oval ^{depressed} depression about an inch and a half long, behind Anterior Superior Angle of left Parietal bone. The depression is very slight, but the edges can be distinctly felt under the scalp, if examined carefully.

History of Case = 4 years ago patient came violently in contact with corner of a beam and was rendered insensible for a minute or two - nothing more followed at the time. In a few months patient became aware of a sensation of weakened nerves i.e. she had not the same feeling of mental vigour as formerly: This deepened into an attack of

Chorea, of a non-descript character, in which the lower limbs were principally affected by the spasm;—the right being worse than the left.

This gradually, after $1\frac{1}{2}$ years, gave way to attacks of violent headache, such as patient never had had before. Any unusual exertion or mental disturbance being sufficient to bring on an attack of headache lasting a day or more accompanied by pain at the part.

I record the case to point out that slight as the depression of bone here is, yet it gives rise to symptoms *i.e.* Headache, with pain and tenderness confined to part of bone depressed.

What the condition of internal table may be here, is hard to say: but I think this case proves that any condition involving pressure on the Brain, however slight is injurious.

— Appendix —

Summary of cases referred to -
page 47.

1. Inflammation - Injury to the parts so
 that slight provocation induces
 inflammation - after comminuted
 depressed Fracture
 British Med Journal 1885 Vol 2
 p 1015

2. Epilepsy -
 American Journal of Med Sciences Vol 29
 1860 p 87.

Blow on head from a pick - depression
 Fits for 10 years - trephined -
 Tooth-like process of bone projecting
 downwards removed - Recovery

3 = Mental Defects

British Med. Journal 1835 Vol 1 p 611

Girl 16 years received blow from coal pick when 5 - no symptoms - no operation gradually memory lost - Temper irritable incapable of application -

Trephined 10 years after fracture - speculum which had penetrated dura mater removed.

no operation

H = Spasms, Cramps, Numbness of Muscles.

Brit. Med. Journal 1862 Vol 1 p 144

Simple depressed fracture, Man 28,

no operation - result spasms etc

Trephined 21 months after -

Spine, 1" long, projecting through dura mater into brain substance - Removed = Recovery.

