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Dr Fayrer

On Amputation at the Hip-joint and excision of the head of the Femur

Joseph Fayrer
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I have selected, as material for this paper, the subjects of amputation at the hip-joint, and excision of the head of the femur, as they are illustrated by some interesting cases that have come under my own observation and care. I do not, however, venture to suppose that beyond my own experience in a few such instances, I have anything original to communicate on these topics: but as personal observation, when faithfully recorded, is never valueless, I submit what follows, trusting that the very limited time which is at my disposal for the composition of a Thesis, will excuse its imperfections.

The subject of amputation at the hip-joint has been especially impressed upon my mind from having been on one occasion called upon to operate, and in another to assist at the operation. Both of these cases I shall refer to subsequently, as they

illustrate interesting points in connection with the subject specially.

It would be exceedingly difficult, nor have I even attempted, to obtain a correct and detailed account of all the instances in which this operation has been performed; but easy enough to show that it has been accomplished so frequently with success, that nothing more than the exigency of the case is required to justify its performance.

I think it more than probable that many of the cases in which amputation was formerly performed, would now be treated differently, and that excision of the head of the femur and not removal of the entire limb, would be had recourse to.

During the last 30 years the excision of joints generally has been followed by such marked success in cases where amputation would formerly have been considered inevitable, that it is not unreasonable to hope, especially in traumatic cases, such as result from

gunshot wounds confined to the head and neck of the bone, for a like proportion of success in the hip. that has attended the excision of other joints, as the shoulder for example, and relating to the alternative of amputation.

It is on the field of battle that the accidents and injuries rendering these operations necessary are most likely to occur. the injuries in civil life and disease, under certain circumstances, may be no unfrequent causes: to military surgeons therefore, we may look for the greatest amount of experience, and from the severity of the great proportion of these injuries that come under their care, I fear not the greatest proportion of success.

I am inclined to believe, as to excision of the head of the femur, that it is an accidental incident to warfare, that the operation has perhaps a better chance of success than under other circumstances, for it is only in such cases that we can

hope to meet with the conditions ne-
cessary to ensure a chance of it. viz the
lesion confined to that part of the joint
which can be removed; for in civil
practice, excepting by the rarest chance
of accident from fire arms, it is difficult
to conceive how an injury could be
inflicted so severe as to require excis-
ion of the head of the bone, yet not suffi-
ciently grave to necessitate amputation
at the joint.

In Caries of the hip the disease generally
I believe always, involves the pelvic,
as well as the femoral half of the joint
in the mischief; and this some cases
are recorded in which removal of the
head of the bone has been attended with
benefit by the abstraction of a source of
extreme irritation; yet generally I
believe, it will be found to afford
little hope of permanent benefit,
for while, in addition to the risk in-
curred by the operation, the disease
remains, perhaps advances more

rapidly in the pelvis and sooner or later proves fatal.

On this subject it must be said however that the highest authorities differ: I venture on no further opinion in the operation in disease of the joint; but in such accidents as I have already alluded to. Gunshot wounds from small musket, rifle or pistol balls; crushing the head & perhaps the neck of the femur, without injuring the large vessels or nerves, & causing no laceration of the soft parts, I have no hesitation in expressing my opinion, that every hope of success may be entertained; and that the statistics of the operation up to this time give so small a proportion of recoveries as one in six, yet I still think further experience will probably prove it to be the proper treatment. Something must be done, there is no hope for the patient without operative interference; the injured parts must be removed

or he will certainly die of irritation and exhaustion long before nature can effect this separation. Amputation at the joint is the only alternative of excision, and surely in such a case, so extreme a measure is not needed. Excision of the head of the femur has as yet been but seldom tried. I have never seen it performed in a case of coxitis, tho' I have in disease many years ago by Mr. Ferguson, nor do I know of any other than those that occurred during the Crimean war. But to them, as well as to the operation as performed in civil practice for disease, I shall again refer.

Amputation at the Hip-joint.

I purpose to offer a slight sketch of the history of this operation, and the estimation in which it has been held by eminent surgeons; to point out the cases in which it is required, the mode of performing it, the dangers and difficulties incident-

to, and consequent upon it; and finally to contribute my own mite of experience, with such remarks as may be appropriate to the cases that have come under my own observation.

Excepting the Cæsarian section, or, what I have lately seen, the removal of the entire tongue from its attachment to the Hyoides, this is one of the most formidable Operations in Surgery; dangerous from the magnitude and importance of the parts removed, the inevitable severity of the shock to the system, of such a mutilation, and from the nature of the circumstances which have rendered it necessary: It can be considered only as the last resource of Operative Surgery in aid of particular cases, and as the sole alternative of certain death; as much, however, when circumstances indicate it unreservedly, it must be undertaken without hesitation.

History.

Morand, a French Surgeon, seems to have been the first to suggest the possibility and practicability of this Operation: he wrote an

elaborate treatise on it, discussing it fully in all its aspects, and pointing out the various modes of Operating; the dangers and difficulties attending it: and the cases in which it might be necessary. His two pupils Bolher and Puthod also wrote on the same subject and formally proposed it to the French Academy of Surgery in the year 1739: they received a favorable report on it from Le Dran and the younger Querin on the 28th July 1740.

Ranton a French Surgeon would have performed the Operation in 1743 if other Surgeons would have supported him; they declined to countenance it.

In 1759 Barbet received a prize from the French academy for the best of 34 Essays submitted to it on this Operation. Other authors about this time published monographs on the subject: nearly all were agreed that it was practicable and advisable in certain cases, and founded their Conclusions or deductions drawn from the results of Operations performed upon the dead human body

or on living animals. Barbet founds his conclusions mainly on the partial resection of a French Surgeon named La Croix, who performed the Operation in 1784 at the Hotel Dieu of Orleans, in the presence of M. Blandin, on a boy of 14 years of age, who had both lower extremities gangrenous from eating diseased rye: both limbs were amputated, one at the joint, the other through the thigh. The boy died on the eleventh day after the hip amputation, being the fourteenth after that of the thigh.

M. Perault of St Maure in Touraine, operated in 1774 on a man who had gangrene of the thigh, caused by the crushing of the limb against a wall by the pole of a carriage: the result was favorable, and the patient lived for some years after, in robust health.

In England it is said to have been first performed in 1774 by Mr Kerr, Surgeon of the "Blues", at Northampton, on a girl of 11 years of age, for disease of the hip joint accompanied by hectic and irritative fever. She lived until the 11th day. The

case is reported by Dr. Todd, Surgeon of the 4th Dragoons. Wm. Pott describes the operation, and the post mortem appearances, and says that the Acetabulum and pelvis were in a carious state, combined with lumbar abscess and disease of the lungs. Wm. Pott also alludes to a case performed by Wm. Henry Thompson of the London Hospital. Probably about the same time. He describes it as "dreadful, tho' not impracticable" but that he would not undertake it himself: tho' the results of Wm. Kerr's case make it evident that fears of immediate danger are groundless. Wm. Pott and Wm. Cullison, with others, appear to have objected strongly to this Operation. Belpeer, Dupuytren and other distinguished Surgeons, as strongly defended it.

In 1807 Wm. Leitch wrote a pamphlet on the subject in which he combats Wm. Pott's views.

Wm. Kerr was so satisfied of its propriety from his own experience in the case alluded to, that he declared he never

would again have any hesitation in performing it.

It was not however until the commencement of the next century, that the operation seems to have received serious consideration in England and Germany, and it was in the French armies that it received the earliest and most decided trials.

M. Blandin performed it three times, and two of the cases are said to have been successful.

About this time M. Perret, a military Surgeon, operated successfully; but I have not been able to find particulars of the case.

In 1798. Mulder operated successfully on a girl 18 years of age.

Larrey was probably the next who attempted it, and during his campaigns in Russia and on the Rhine, he performed it, I believe, seven times; in most of the cases under unfavorable circumstances. Two of his cases are said to have recovered perfectly, and some of the others to have died from causes

independent of the Operation; or from privation and fatigue.

Dr Millingen is said to have had two successful cases about this time.

Mr Bates performed the Operation in 1812 upon a child aged 7 years, who recovered, notwithstanding that the Colyloid cavity was diseased: the patient however sank subsequently from Diarrhoea and Scrofulous disease in the pelvis.

Mr Brownriff Operated on a Soldier, wounded at Merida in 1812, with success: the man lived for some years after in England.

Mr Guthrie also Operated successfully in 1815 on a French Soldier, after the battle of Waterloo: the man was afterwards an Inmate of the "Val de Grace" Infirmary for the Invalides. Mr Guthrie says. "18 or 20 ways have been suggested for doing this Operation, and twenty persons are believed to have survived its performance, several of whom may be now living"— Both these Gentlemen had Operated previously without success.

Dr. Emery performed the operation about this time, the patient surviving 30 days.
Mr. Blicke had a case of secondary amputation, two months after the injury had been inflicted: the patient survived 8 days.
Mr. Delpech about this time had also a successful case.
In 1823 Mr. Syme operated on a lad of 19, who had suffered from necrosis of the entire bone: an unusual number of vessels had to be tied, and the operation was followed by obstinate vomiting for 36 hours, but the patient recovered.
Mr. Syme has had, I believe, other cases since and certainly one successful one. The patient recovered perfectly, and died ultimately by his own hand long after his recovery from the operation.
Mr. Liston operated twice, I believe, in Edinburgh; & Dr. Handyside once; the latter successfully.
Successful cases by Mr. Bromfield and Sir A. Cooper in 1824, by Mr. Wilson in 1826, by Dr. Mott & Dr. Hosack in 1824

by Wm Bryce in 1825; & by Mr Wedemeyer about the same time are recorded.
In 1836 Mr Mayo amputated the stump of a previously amputated thigh, for obstinate neuralgia, which was rapidly wearing out the patient, and amenable to no treatment: The result was perfectly satisfactory: the pain disappeared, and the patient recovered. In 1844, or 45 Mr Handyside operated successfully in Edinburgh.
Thus, as Velpeau says, "an operation said by Richerand to be hardly admissible had been successful nearly 20 times in less than ten years."
The number of unsuccessful cases I have not been able to ascertain, nor is there, so far as I am aware, any means of doing so.
I would add that amongst other names eminent in surgery, Jaeger, Baudens, Sedillot, Textor, Rhiner, Pelikan and Conradi are recorded as having performed this operation, but I am not aware with

what amount of success.
In more recent times Langenbeck reports that seven cases of amputation at the hip-joint occurred during the Schleswig Holstein war, from injuries incident to military service, in five of which he was the operator; only two of the seven cases only one recovered.
It was performed, as far as I can ascertain, three times during the Punjab Campaign, but all terminated fatally. This is said by Dr. McRae the field Surgeon, to have been owing "to the extent of the original injury and fatal shock caused to the constitution by it. All the cases were cannon shot wounds high up in the thigh, with extensive lacerations, loss of soft parts, and comminution of the bone. One case lived only six hours; one two hours, and the third thirty six hours. Stimulants and Opium were rejected by vomiting, the system being under fatal collapse from which nothing could rouse it. Amputation was had

recourse to as the only chance of life"
During the last Campaign in India as
far as I can yet learn, amputation at the
hip joint has been performed only twice,
but in both cases successfully. The
cases were the results of severe injuries;
by round shot, in one instance, by a shell
in the other.
The first case was that of a soldier aged 27
years who received a compound comminuted
fracture of the thigh, the injury extending
to within an inch of the trochanter, with
extreme laceration of soft parts. The flap
operation was performed, the back flaps,
that the circumstances would admit of,
being made. The patient was easier after
it, and his pulse improved; but he sank
in 12 hours. Very little blood was lost.
The other case was that of a native-a Sycee
or groom, who received a compound com-
minuted fracture of the upper third
of the femur, the integuments being
freely lacerated, but the artery uninjured.
Amputation by antero posterior flaps

was performed. The operation was followed by excessive vomiting, which was partially allayed by Chloric ether and Opium with effervescing draughts. he sank 24 hours after the operation. In both these cases Chloroform was used. ~~The extent of~~ the original wounds were so extensive as to leave little hope of life: the amputation however, certainly increased the chance, allayed pain, and delayed death.

Another case occurred which is so nearly allied to amputation at the joint that I just mention it. An Officer, aged 36 years, had the upper third of the thigh fractured by a musket shot, the femoral vein was also wounded. In this case the bone was comminuted so high up that amputation was performed at the trochanters, the operation having been commenced and the impression, that it might be necessary to resume the bone at the joint. It is stated that the venous haemorrhage in this operation was excessive, whilst the arterial was trifling. The patient suffered greatly

from the shock of the Operation. all the
performed under the influence of Chloro-
form: Reaction never took place and he
sank within six hours.

Another case of amputation at the trochanter
is recorded after a comminuted fracture by
Grape shot. the patient sank from hæmorrhage
during the night after the Operation. He
was a sickly man when wounded, had
suffered much from the climate of
India, and was depressed exceedingly
by the shock of the wound and the Operation.
Amputations of the thigh have been
innumerable, but these are the only
cases where the Operation has been
performed at the joint, so far as I have
at present been able to ascertain.

During the last Burmese Campaign
in 1852–53 it was performed twice,
one case, hereafter to be described, lived
29 days and died of Tetanus; the other
sank within a few hours after the Operation.

Mr. Legouest a French surgeon has
placed on record some interesting

information on this subject. It appears that the French had thirteen cases primary and secondary after the battles of Alma and Inkerman; all terminated fatally. One Russian soldier who was operated on by M. Legouest on the 3rd October 1853 at Constantinople, died on the 4th Feby. 1856, from the result of an accident: he fell, causing hæmorrhage from the stump, which so reduced him that he sank under an attack of Diarrhœa. This might fairly be reckoned a recovery as far as the amputation was concerned. M. Thomine reports three of the cases: one patient lived 15 days; another 20 days, the third died of Cholera.

M. Legouest states that out of 44 cases collected by him, he finds that three were Primary Cases 30, All fatal
Early secondary " 11, Three recovered
Later secondary " 3, One recovered
Total 44 - 4 recovered
a total of 4 recoveries out of 44 Cases.

Some of the primary cases died on the table, all excepting two, before the tenth day. Thus, if we reckon the cases recorded by Legouest, our own Crimean ones, the Holstein and Indian ones, we find a total of 170 cases, out of which 5 only recovered; or a mortality of 92.86 per cent.

The Russians in Sebastopol had 3 cases, Dr. Pirogoff was the Operator, all proved fatal. One died in three hours, one in two hours, another in two days. This is very discouraging for Military Surgeons, the proportion of deaths being enormous; but it must be recollected that most of these cases occurred under unfavorable circumstances. We know how our men suffered from privations and hardships in the Crimea and in India; and it is not improbable that the debilitated state of constitution in which they were when they received the wounds, added to the extent and severity of the injuries inflicted, might have rendered them

more likely to succumb, than under more favorable circumstances.

Thompson says. "To form a judgments on the results of great operations performed in military practice, it is necessary that we should be acquainted with the situation and accommodation of the hospitals into which the wounded were received, the diseases of the Climate, the season of the year, the healthy or unhealthy condition of the air, the treatment of the wounded, with the period, manner, and circumstances in which amputation had been performed and with the cause resulting in death in particular cases."

The history of wounds of the Crimean Campaign is still sufficiently fresh in our memory to obviate any difficulty in conceiving our half starved, half famished men to have been in an unfavorable state for bearing great Operations.

It must also not be forgotten that the Operation of Amputation at the hip joint, terribly fatal as it proved was the only

alternative of still more certain death.
The records of civil practice are more encouraging, but here also the advantages proposed by both Surgeon and patient should receive due allowance.
Mr. Sands Cox states that the experience of civil and military practice combined up to 1846, gives in all 84 Cases, out of which were 26 Recoveries; 14 of the successful Cases being after accidents, and 20 of the unsuccessful, after Injuries.
He gives two Statistical Tables of the results, one of the successful Cases, the other of the unsuccessful. There is omitted in them but one case mentioned by Delpech as having been seen by Delaunay at Moscow, in which the patient had partially recovered from amputation at the Hip-joint after gangrene of the limb. It is also said that a Sailor who was operated on at the battle of Aboukir recovered from the effects of the Operation; but this is not well authenticated.

Wm. Cot himself performed a successful operation on a Girl of 23. She had previously undergone amputation of the thigh for disease of the knee joint. This is the third case in which disarticulation of the limb has been performed after amputation of the thigh lower down: and all three successful cases.

Of the successful cases recorded by Wm Cot.

14 were traumatic
7 from disease
In 6 the nature of the cause unknown.

} Successful

20 were from injuries
18 " " disease
20 " " Cause unknown

} Unsuccessful

In the Medical Times for April 1857 I find a further record of 8 Cases, of which two were for accidents, one being primary and the other secondary, the other 6 Cases were for disease. There were three recoveries and five deaths.

Double

One from haemorrhage on the second day.
one from exhaustion on the Eleventh day
one from shock in two hours
one from haemorrhage in two hours
one from shock immediately.

Two recovered, amputation performed for Malig: disease
One recovered " " " Necrosis
The 8 Cases were
2 Compound fracture
5 Malignant growths
1 Necrosis.

In the "Medical News" of 1857 April, I find that Mr Stanley operated for malignant growth of the bone, of a thigh amputation. The patient died from hæmorrhage after the operation.

A case is also mentioned by Mr Curling for Medullary Cancer in the thigh: the patient survived the operation ten months.

I believe it has been performed more than once since in Civil practice, and I have no doubt in the present campaign in India; but as I am not in possession of any satisfactory information on this head I do no more than allude to it.

In this brief and imperfect sketch of the history of this Operation I do not profess to have communicated all the

cases in which it has been performed can to have referred to all the authorities who have written on, and described it. My object is simply, in giving an outline of its history, to shew that it has been always advocated and countenanced by the best authorities; that its statistics prove that it has had an amount of success to warrant its being performed when the exigency of the case indicates that it is the only remaining chance of life to the patient; that decision having been arrived at after mature deliberation. Chelius says that the proportion of successful and unsuccessful cases is about as 1 to 2½. This has reference to the death alone solely to the operation, and does not include such as have resulted from other extraordinary causes. I am not in possession of a sufficiently accurate detail of all the cases, with the results, in which it has been performed to enable me to arrive at any distinct conclusion on the subject of average results, but one thing is evident

that the mortality attending this operation is excessively high, whether in Military or Civil practice, but greater in the former as shewn by the Surgical Statistics of Civil hospitals, compared with the records of Military practice; nevertheless as Morand sup. "C'est toujours en balançant les avantages et les inconveniens d'une Operation quelconque qu'il faut juger de son utilité" - and if the result prove that it saves life at all, that must otherwise inevitably be lost, sufficient has been said in its favor.

Cases in which Amputation at the hip-joint is required.

With reference to the necessity for amputation and the cases requiring it. First of all it is to be remembered, that it is never to be resorted to, but when the patients case affords no hope otherwise of escape from certain death. Sabatier sup that Barbet recommended it in cases "where a Cancer

shot or other such cause has crushed the limb or carried it off. the remainder should be amputated at the hip joint. if too high to admit of amputation through the thigh. Complete Sphacelus extending close to the joint and which has destroyed the greater part of the surrounding soft tissues, renders the Operation equally necessary and easy. It would also be required, if the femoral artery should be shred, or an aneurism should have occured beneath the ligament of Fallopius, which did not leave hope that the circulation could be reestablished in the wounded limb." The treatment would be rather different now.

Larrey says, "amputation at the joint must be performed when the limb is disorganized, or carried off by a cannon shot or shell so near the joint, that it is impossible to amputate below it.

2d When a blow from a ball of large size has crushed the limb near the trochanter and divided the femoral

artery, or crushed and disorganized the
Sciatic nerve.
3d when the limb in consequence of an
injury is threatened with Sphacelus
close to the superior joint."
Thompson says, "where a musket
ball, bit of shell, or grape shot has
fractured the neck of the femur, or the
head, and gaped through it, or has lodged
in the joint" — such a case would now
be treated by excision.
"If a principal artery, in addition to
the bone, be wounded, the operation is
still more necessary; but if the ball
have entered the pelvis, the operation is
useless. If it have merely wounded the
Acetabulum, without entering the
pelvis, there is hope of success, but the
case is very doubtful.
When the Capsule is opened, but the
bone not injured, amputation will
probably be necessary; but such cases
may also terminate by anchylosis —
Secondary amputation at the joint.

1st In cases such as have already been mentioned where the primary Operation has been deferred, or neglected -
2d In cases where the disease has extended to the joint, after an attempt to save the limb, hectic supervening.
3d In cases of dangerous hæmorrhage, ulceration or sloughing of the soft parts; or if incurable disease of the bone supervene after amputation of the upper part of the thigh.
Balls may open the capsule, and only anchylosis be the result: but more probably abscess, disease of the bone, caries, hectic and death, if no Operation be had recourse to.
Balls may also lodge near the joint; and in the parts in its vicinity, occasioning abscess in or about it: also they may induce ulceration of the articulating cartilages, and absorption of the head and neck of the femur."
Mr Guthrie says "It may be laid down as a principle in all cases of accident; whether

from shot, shell, or railway carriages, that no man should suffer amputation at the hip-joint when the thigh bone is entire. It should never be done in cases of injury, when the bone can be sawn through immediately below the trochanter major, and sufficient flaps can be preserved to close the wound thus made: an injury warranting this operation should extend to the head or neck of the bone, and it may be possible, as I have proposed when then to avoid it, by removing the fragments. If, after a fracture, in course of treatment, the principal artery should be wounded by some accidental motion of the bone, amputation should be immediately resorted to; a ligature on the artery higher up would fail. When the femur is suffering from malignant disease commencing in the periosteum or its cancellated structure, I am reluctantly obliged to say that the removal of the whole bone at the hip-joint offers the best, perhaps the only, chance of success."

Velpeau says, "a comminuted fracture, of necrosis, Caries, Osteo Sarcoma, Spina ventosa, any incurable alteration whatsoever of the femur extending to the upper part of the shaft: Gangrene, or, in a word, any other disease that attacks close up to the hip-joint, and which is of so grave a character as to need amputation, require it: provided that the Cotyloid Cavity and the bones of the pelvis be not affected. Gunshot-wounds with injury to the bone in the upper third of the thigh are the most formal indications of its necessity. In such cases it is requisite that the Knife should divide at a certain distance above the evil. I see no reason why it should not be attempted: Exam Analogy and a knowledge of previous facts, leads us to believe that, "Celeri paribus", it is not more dangerous than amputation in the upper fifth of the thigh. The operation is easier and infinitely quicker. The wound is much larger: we divides the same muscles

and vessels: and there is not need of so much material to obtain adaptation of the flaps. Only let it be practised in less desperate circumstances, and I am convinced that it will have a sufficiently large proportion of success"—

Sir A. Cooper says. "A question in the first place arises whether we should perform the Operation of amputation at the hip-joint when it can be done through the trochanter major. I say no. unless the disease of the thigh bone extend quite up to the joint: It is undoubtedly better to saw through the trochanter major than to cut the bone from the acetabulum. When the acetabulum is laid bare, great constitutional irritation is produced by the suppurative process. abscess after abscess arises and the life of the patient is placed in imminent danger."

Cheselden says "so great an extension of mortification as affects the thigh, throughout its whole thickness, and such crushing of the bone and of the soft parts as renders

Flaps amputation below the great trochanter impossible, can alone be considered as indications for amputation at the hip joint. Caries in the hip joint can never indicate this operation because the socket is always affected."

Wm Lynne says. "The thigh may be amputated at the hip joint; but in this case the shock inflicted on the system is so great, and the wound which remains to be healed is so extensive, that the operation ought not to be performed unless the patients situation affords him no other chance of escape from certain and speedy death"

Other authorities might be quoted to the same effect, but I think that from the above I may deduce the causes necessitating Amputation at the hip-joint - to be the following.

Injuries from Cannon Shot. Shell. Machinery, Railway Carriages, or Musketry, rifle and pistol Shot, causing compound comminuted fracture of the femur near or at the joint;

combined with wound of the principal vessels and nerves; Malignant growths, necrosis and Caries of the femur, destructive crushing of the soft parts of the limb from machinery, shot or shell, or any other cause of violence by which the vitality of the limb is destroyed, or the great vessels and nerves torn across, with laceration of the Muscles & Integuments so high up as to render amputation through the thigh impossible, Gangrene of the whole limb extending near to the pelvis and disease of the bone not implicating the pelvis.

It has also been considered necessary in the case of painful and obstinate neuralgia in the stump of a previously amputated thigh; but the propriety of the proceeding may certainly admit of question — In cases of injury of the head and neck of the femur, or indeed of the upper part of it uncomplicated with wound of the femoral artery or vein, or crural or sciatic nerves or much laceration of the soft parts amputation is not indicated

section of the injured part of the bone should be had recourse to. This I shall again refer to; as also to the proper time for operating.

Mode of Operating.

It would be more curious than interesting or profitable, to enter into a description of the various ways in which this operation has been performed; I shall therefore content myself by describing that now recommended.

Tho many of the various methods suggested by different Surgeons have doubtless their respective advantages, yet it is manifest that in a large proportion of cases they would be inapplicable, as it frequently happens that the Surgeon has to be guided entirely by the peculiar circumstances of each case as to the mode after which he will operate. Where the injury necessitating the operation has been attended by much laceration of the soft parts, the flaps must be selected from what is left according to the ingenuity of the Surgeon and as he may be best able. In cases of Gangrene he may have full

still greater difficulty. When the soft parts have remained comparatively uninjured, as in cases of disease of the bone, or when the wound has been inflicted by a small bullet wounding the artery, as well as comminuting the bone, a choice is left to the Surgeon; and in such cases he has the option of selecting the method which may appear to him best adapted to the case.

In such an instance I should, as I have done, perform the Operation which may be called a modification of Beclard's and Lisfranc's. it is recommended by Mr Syme and other distinguished Surgeons.

Some of the olden Surgeons, and among them Larrey. Delpech. and even Sir Astley Cooper, placed a ligature on the femoral artery before commencing the Operation. This plan is not now recommended, for it is unnecessary. The artery is to be compressed by an assistant against the bone, who following in the track of the knife after it has transpierced the thigh for the anterior flap, grasps the artery and thus commands

it until a ligature can be applied. The arteries in the posterior flap are to be provided for in a similar manner. The knife should be long narrow and sharp pointed; the flaps may be made by cutting from without inwards, or the reverse; the latter is the plan recommended, supposing the Surgeon to have his choice of the mode in which he will operate; the best plan is to enter the knife midway between the anterior superior spine of the Ileum and the trochanter major, letting it emerge near the anus, cutting outwards and backwards posterior to the bone, and downwards, to form the posterior flap. The anterior flap is made by cutting down close to the bone in a ~~sufficient~~ such manner, an attempt, to make it sufficiently and large to adaptitself well to the posterior flap which is shorter & smaller. In cutting the anterior flap, the finger of the assistant should follow the knife to seize and command the vessels as soon as divided. Which will happen as the knife is directed away from the bone to complete

the flaps. The limb should now be forcibly abducted, the point of the knife inserted into the capsular ligament, and as the head of the bone is turned out, the round ligament should be divided. Any muscular attachments left undivided may now be separated, and the limb removed. In fractures of the neck of the femur from gun shot wounds, the advantage of being able to use the limb as a lever is lost, and the detached head of the bone must be dis-articulated by the best manipulation the Surgeon can adopt: it renders this part of the Operation much more difficult than when the shaft of the femur has remained entire.

Of course in Cases where the destruction of the integuments and soft parts prevents the possibility of adopting the above described mode of Operating, the Surgeon must use his own discretion and ingenuity in selecting and devising the best flaps that the circumstances admit of: endeavoring

to secure sufficient integument and soft parts to close the wound perfectly, and form as good a stump as possible. The various modes of operating proposed by different Surgeons are described and arranged by Chelius under the following heads: the Circular, Oval, and flap amputations: he describes each fully and by Submitowar recommended. I have neither time nor space to transcribe them, nor would it serve any purpose to do so - I believe the double flap amputation I have described, with such modification of it as the circumstances of each particular case may require, the best.

In no operation is the Surgeon more dependent on his assistants for its successful and satisfactory termination than in this. It is essential that the femoral artery be committed to the care of an experienced Surgeon, whose presence of mind and nerve should

be no less than that of the Operator. It is his duty to compress the vessel where it passes over the bone, until it is divided in forming the flap, and then following the knife to tie and compress the cut extremity until a ligature can be applied; he will not only have the femoral, but the small branches of the anterior flap to attend to. The vessels of the posterior flap must be managed by another assistant. The proper management of the limb too is of the greatest importance and assistance to the Operator both in making the flaps and in disarticulating the head of the femur. Should the neck of the bone, or its upper third, be broken, the lever aid is lost, and the fragments with the ruptured portion and head, must be secured as they best can be by grasping them with the fingers and disarticulating them as best he can with the aid of the knife in dividing the ligaments.

The great danger of the Operation is the terrible shock to the system & the loss of blood which may occur if the vessels be not skillfully handled and promptly secured. The dangers subsequent to the Operation are all those peculiar to other great amputations, intensified in proportion to the size and importance of the part removed: the exposure of a large articulating surface, produces suppuration and consequent exhaustion or irritative fever; secondary hæmorrhage; ulceration or sloughing or inflammation of the stump; Pyæmia, Phlebitis. Tetanus; or the shock of the Operation may be so severe, tho' apparently partially recovered from, as never to be succeeded by perfect reaction, and the patient may sink within immediately after, or within two or three days subsequent to the Operation. Chloroform is, I believe, of the greatest service. It prevents pain and renders to a great extent the dread of the Operation, it diminishes the shock

both of the injury and the amputation, and so economizes the patient's vital powers: under its influence I believe the operation may be earlier performed than it could be without it, and this is a point of great importance.

The great mortality that has attended amputation at the hip-joint is perhaps more due to the extent of the injuries for which it has been performed than to the operation itself, which indeed, so far from aggravating the patient's sufferings or increasing his danger, has usually been followed by comparative ease and freedom from pain, as well as amendment in the pulse, and other signs of reaction, such as probably would not have been manifested, had the patient not been so assisted.

Larrey and other Surgeons have thought, that were the operation more immediately resorted to and in desperate cases, a greater proportion of success

might be anticipated: he says.

"Le pense que si un habile Chirurgien avait le Courage de faire cette Operation sur and les blessures le Commandent immediatement apres l'accident; elle reussira en proportion pre celle pr'on pratique a l'articulation de l'Epaule."

The Opportunities Offered during the late wars in the Crimea and India have been frequent, but in many Cases the extent of the injury has rendered the Operation all but useless: While the privations and other disadvantageous circumstances attending the patients position, have been so great, that the mortality has been exceedingly high. Surgeons in Civil practice have been more successful, probably from the cases having been of a more favorable nature and the circumstances under which the patient underwent Operation of a more favorable character.

Proper time for amputation.

"Cut off the limb quickly" says Boiseau,

"whilst the Soldier is heated and in mettle;"
with few exceptions since his day early
amputation after gunshot wounds has
been recommended. The discovery of the
anaesthetic properties, and their applica-
tion, of Ether and Chloroform, has done
much towards the success of primary
operations, as contrasted with secondary,
yet none marked; as by it, all pearly
intensifying the shock by operation
is obviated: Consequently the tendency
at present is to still earlier interference
than formerly. There seems to be but
little doubt that as a general rule
amputation after an injury can
hardly be performed too soon, especially
in cases where the arm, forearm or
leg below the knee are concerned. but
it is somewhat different with the thigh;
for the shock is so great, that in many,
probably most cases, immediate
amputation would be fatal.
My own experience derived from
three Campaigns, the Charges of the

Field-hospital of an army in the field and of a large Civil hospital in Edinburgh for some years leads me to the conclusion that in those cases where the patient is ever to recover from the shock at all he will be able within the course of a few hours, I might almost say immediately, to undergo amputation if it be of the arm or leg below the knee: but that the collapse following extensive simple fracture of a thigh, and still more extensive injuries and disorganization caused by round shot, shell or machinery, is not so speedily removed from: and that to amputate in such a case before reaction had set in would be inevitably fatal — In many cases of injury of the thigh so severe as to require amputation, the collapse is so complete that reaction never occurs, and the prostrated powers of life sink within a few hours after the infliction of the wound, or perhaps much sooner without an attempt at re-action. A pale

skin bedewed with Cold perspiration, a
sunken and almost inaudible voice,
barely perceptible pulse, hiccough, vomi
ting, with sometimes trottelling of the
lacerated muscles & frequently absence
of all pain are the signs of this state
of fatal collapse. To amputate in this
condition would be useless -
I should add that I have occasionally
seen the same results from amputating
trifling wounds, but they are the exception
and not the rule in such cases -
Particular Constitutions possess powers of
rallying after severe injuries, that others
are incapable of &: and I have seen
a shattered thigh cause less alarm, mental
perturbation and physical prostration,
than a simple and compunating harmless
flesh wound. but these also are exceptions.
Examples. Miss P— aged 18 years
had the limb carried away completely
at the middle of the thigh by a round
shot which had passed through the
wall opposite to which she was standing.

in an hour She was able to undergo amputation, which I performed in the hope of saving her life. but as happened in most other of our fresh operations during the Siege of Lucknow. She sank under the effects of it.

Lieut A— of the Artillery aged 28 yrs a powerful young man, and as healthy as could be expected, under the circumstances, for it was towards the end of the Siege that the case occurred, had his thigh shattered by a 6 pound shot; he remained upon the ground upto his death in a perfect state of Collapse. he survived about 8 hours. In this case the injury was not so extensive as the other, yet there was no attempt at reaction.

Lt K. L— an old Officer about 50 yrs of age, with an enfeebled Constitution and suffering from chronic disease, had the upper part of the thigh lacerated, and the head of the bone Comminuted by a piece of a Shell: he lived 2 days

and within an hour after receiving the wound was perfectly able to give his attention to what was going on about him, he directed the operations of the defence up to a short time before his death, appointed his successor, and gave all the instructions that he thought would be most useful after his death. He was, notwithstanding, never in a state to submit to operation, had such been deemed desirable, which, from the extent of the injury involving fracture of the pelvis was not the case.

Ensign D— aged about 19 years had both legs, below the knee, carried away by a round shot. He underwent amputation within 3 hours after the injury, and survived several days; death was due ultimately to privation and the results of a burned hand when the Residency was evacuated. I could easily multiply illustrations but it is unnecessary.

It may, I think, fairly be concluded

that the proper time for amputation 49
is when reaction has well set in, and
I think that under the influence of
Chloroform, a little earlier than
without it. The proper condition of
the patient to bear amputation is
recognized by a glance at his face, or
a touch of his skin or pulse -
I have used, and have seen Chloroform
most extensively used, and believe it
to be of the greatest benefit. I have repeatedly
used it when I had no professional
assistance and when it was admin-
istered by natives or by others equally
ignorant, and have seen nearly any
accident or evil result. I believe it
to be of the greatest benefit, as great a
boon and blessing in Military, as it is
in Civil practice - We fortunately
had a good supply of it during the
Siege of Lucknow; enough to last
throughout the entire Siege, in the
most serious cases: how much
suffering it spared our mutilated

companions and comrades may be imagined: it was freely used and highly appreciated.

The question of primary amputation can hardly admit of doubt as to its propriety, where the circumstances are such as to admit of its being had recourse to, and especially in the hip-joint; for the additional wear and tear of the vital powers inevitable in the inflammation and suppuration of a joint of this magnitude, during the time that precedes a secondary amputation, with the additional difficulty of the operation owing to the alteration in the conditions of the structures about the joint, and the greater loss of blood always attendant on secondary operations, must reduce the patient's chance of recovery, at the best according to statistics, in the proportion of one to three.

Excision or Resection of the head of the femur.
Wm C. White of Manchester is said to have been the first to suggest this operation in 1769. Wm A. White of the Westminster hospital first performed it in the year 1822: he removed 4 inches of the femur for Morbus Cotarius, the head of the bone lying on the dorsum ilii. The boy who had suffered for 8 years, recovered: at the end of a year he was able to walk, lived 5 years after the operation, and died of Phthisis.
Wm Hewson of Dublin performed it, but without success: the disease continued in the pelvis and proved fatal.
Wm Green records a case: the patient survived the operation three months.
Mr Coote also excised the head of the femur and I believe the case terminated favorably.
Sentin, Oppenheim and Schwartz operated, removing several inches of the bone with the head, after comminuted fracture from gunshot wounds. Sentin's case survived 4 days. Oppenheim's case 18 days.

Sector operated three times; once successfully on a child of 7½ years of age, on account of fracture of the neck of the bone followed by abscess; in the second case, on a young man for caries, he died on the 4th day; in the third, on a man of 54 years, on account of caries of the great trochanter and neck of the thigh bone. 6 inches of bone were removed, the patient surviving 53 days.

Sir B. Brodie also performed the operation in a case where the bone had, from disease, been displaced into the dorsum of the ilium. the case terminated fatally.

Mr. Earle in 1831 recommended it in some rare cases of disease of the joint.

In 1845 Mr. Fergusson performed a successful operation for morbus coxæ in a boy, the patient recovering with a tolerably useful joint; about 4 inches of the bone measuring over the head of the neck of the femur, were removed. After recovery, the limb was apparently about two inches shorter than the other.

Mr. Greene records a case in which he

operated: the patient survived three months. Mr. Coote excised the head of the femur in hip disease; the case is said to have done well. Dr. Rose also in 1850, but the result was ~~fatal~~ doubtful Mr. Lee also performed the operation, and gives it as his opinion that the surgeon is justified in removing the head of the bone. Dr. Sayre of New York gives a case of excision for Morbus Coxae in 1855; and a summary of the operations up to that time: of 30 cases Dr. Sayre says. 20 recovered, 10 died.

Mr. Carmichael performed the operation on a young woman for Medullary Sarcoma, but she died the next day. Cases are reported to have been operated on by Kluge, Ohle, Schwartz & Rogers but I can ascertain nothing of their history or results.

In the Medical Times of 1857 there is a further record of 4 cases:

one by Mr. Hancock, Charing Cross hospital

one by Mr. Erichsen, University College hospital

one by Mr. Ive, at St Mary's hospital,
one by Mr. Stanley, at St Bartholo: hospital:
All these operations were said to have
been followed by great relief from irrita-
tion, & improvement, and to have dones well.
Of late years it has been frequently performed,
and is strongly advocated by some, tho'
deprecated by other authorities.
Mr. Jones of Jersey and Mr. H. Smith
of London have spoken favorably of the
operation from their own experience.
In short since 1845 it has been
frequently performed for disease of the
hip joint, and it is said, with success.
How long the beneficial effects lasted
it would be interesting to ascertain.
but I doubt very much whether the
subsequent history of the patient would
bear out and confirm the reality of what
has been said in its favor.
Fergusson, who performed the second
successful operation says of it.
"I can scarcely say more on the subject
than express a belief that in some

instances of disease, or pushed injury of the head or neck of the bone such a proceeding might be service. If the operation were undertaken for disease of the hip joint, it would probably be necessary in most cases to scoop away any portions of the Coty loid Cavity at the same time, but as in such cases, the extent of disease in the Os innominatum could not well be ascertained before making the incision, and probably not even then, I fear that the results of the operation would often cause disappointments. All this I have for more than ten years meditated the performance of this operation in Morbus Coxarius, I have never, amongst the numerous cases of this kind which have come under my notice, met with a single instance, where the practice could have been deemed justifiable. The incurable nature of the disease after caries has been established is but too well known — In pure Shot injury, the operation has been

proposed to save the patient from almost
certain death, or the fearful and preca-
rious alternative of amputation at the
hip-joint: and in future years the
recommendations of such high authorities
as Mr Syme & Sir Geo. Ballingall,
and others of almost equal note, may
possibly be put to the test of experience".
Subsequently, Mr. Ferguson appears to
have changed or modified his opinion
for he relates a case in which, deeming the
operation desirable, he performed ct.
Mr. Syme's amp. of excision of the head
of the femur in hip disease. "It is evident
that the extent to which the acetabulum
is almost always affected in the hip
disease, forbids any attempt at excision".
Chelius amp. "Caries of the hip joint
can never indicate amputation, because
the socket is always affected." For the
same reason excision is contra indicated.
And I believe that other Surgeons of
eminence are of the same opinion
with reference to excision of the head of the

bone in disease of the joint.
The records of Military practice up to the time of the Crimean war, do far as I have been able to ascertain, furnish only a case performed by Dr. Scutin at the Siege of Antwerp It has not been done, as far as I know, in any of the Indian Campaigns, nor been during the present one. In the Crimea it was performed 8 times, out of these, only one case recovered: three were 5 primary, and one secondary case; the successful case was a primary one.
Dr. Medard operated on the first: the head and neck of the femur had been fractured by a musket ball, the man was wounded on the 18th June and operated upon, on the 5th July: he died of Cholera in a week after the operation; the wound being, at the time he was seized with Cholera, in a healthy state.
Dr. Blenkins of the Guards did

the neck Operation: the head and neck of the femur had been shattered by a fragment of a shell; the patient died of pyemia at the end of the 5th week.
Dr Crerar of the Staff, operated on the third case; injury from a bursting shell, the head and neck of the femur being fractured; the patient died of exhaustion on the 15th day: nature having made no reparative effort.
Mr O'Leary of the 68th L.I. operated successfully on a private of that Regt: the injury was inflicted by a shell. In this case, 5 inches of the femur were removed. The patient recovered in three months, and has been seen since with the limb, this much shorter, still useful.
Dr Hyde operated on another; the injury was inflicted by a grape shot, and the patient died on the 5th day.
Dr Coulbe of the Artillery operated on the sixth case: the injury was fracture from a gun shot wound

The operation was secondary: the patient survives a fortnight and died at last from exhaustion.

Notwithstanding that the loss was so great in these six cases, I think there can be no doubt that the Operation is a good one. At all events it is the only alternative of the treatment more dangerous one of amputation at the hip joint, or certain death.

Cases in which excision is to be performed.

One of the first living authorities has said, that in disease of the hip joint, owing to the presence of the disease also in the Acetabulum, excision is not to be performed. In this opinion many concur. Others state that they have Operated in such cases with advantage. There may be examples of disease in the hip joint, where, after the head of the femur has been displaced by destruction of the ligaments, or to the dorsum ilii, the soft parts in the vicinity destroyed by ulceration or disorganized by disease, and the

diseased part itself almost protruding through the skin, its subjacent wasted and emaciated tissues, the removal of the head and diseased portion of the bone may be of benefit; but they are the exceptions; and it would probably be found that the operations recorded, if the history of the patients could be traced, do not indicate so great an amount of permanent benefit as has been attributed to them. It is true that in this operation you do not excise the head of the bone in the hope of preserving a useful limb, so much as that you substitute the lesser of two dangerous operations, for the purpose of saving life; and it is especially in this point of view, that it should be (should be) considered by both Military and Civil Surgeons.

Dr. Guthrie says "Picture to yourself a man lying with a small hole in the thigh either before or behind, no bleeding, no pain, nothing but inability to stand on the limb or move it, and think that

he must inevitably die in a few weeks or months, worn out by continued pain and suffering, unless his thigh be amputated at the hip joint, or he be relieved by the operation which I insist upon it, ought first to be performed." It is in such cases then, where the head and neck of the femur, or even also part of the upper third of the bone is injured by gunshot wounds communicating the bone, but not injuring the principal arteries, or large nerves, nor extensively lacerating the integuments or muscles; in cases of malignant growths, disease, caries or necrosis confined to the femur, that the operation is indicated, and in which I trust it will stand the test of future experience. In such cases as I have described I believe there can be no doubt as to its propriety. Mr Guthrie and Sir G Ballingall have recommended it; and I think it would be approved by other authorities who do not regard it favorably in its application to this disease

Mode of Operating.

As in amputation, the mode of operating will depend a good deal on the circumstances of the case. Mr. Fergusson recommends that a semilunar incision be carried across the posterior surface of the limb, about 3 inches above the trochanter; its ends being so limited as not to interfere with the crural nerve in front, nor the gluteal artery behind: and from the centre of this, a straight line of incision should be carried downwards over the trochanter, the two being of a length proportioned to the bulk and depths of the parts. The flaps thus formed are to be reflected, and the head and neck of the bone and capsular ligament thus exposed. The capsular ligament should now be cut when by rotating the limb (which is seldom practicable owing to the fractured state of the bone) the head of the femur is exposed; the round ligament being divided, the part-

to be removed is separated by cutting through the shaft of the bone with a saw. Should the injury be found, at this stage of the proceedings, to be so extensive as to preclude hope of success from excision, the operation can be converted into that of amputation by making an anterior flap, having completed the incision first made into a posterior one.

The treatment after the operation is simple, water dressings strict, and perfect rest for the limb, supporting it on a splint for the purpose of keeping the upper end from protruding through the wound, or resting on the dorsum ilii. The dressings should be so applied that they can be changed without removing the splints. Sir G. Ballingall and Mr Guthrie recommend a very similar mode of operating.

I have now protracted this paper to such a length that I forbear further remarks on the subject of excision and proceed

to relate briefly a few cases of injury to the hip-joint that have occured in my own experience -

Cases.

Case No. 1. The following case occured during the last Burmese war, when our forces were occupying Rangoon; I was at the time in Medical charge of the Civil and police duties of the station, in addition to my military medical duties in the Field hospital.

A Burman aged 30, was wounded in an affray with Dacoits: the ball had entered the upper and outer part of the left thigh, taking an oblique direction upwards and inwards, had shattered the femur, and apparently lodged in the muscles on the inner side of the thigh, as there was no counter opening. The wound was small not admitting the little finger, and had been inflicted by one of the slugs with which the Burmans so frequently load their muskets. He was brought to the hospital where I saw him on the

morning of the 16th March 1858; the limb was shortened, and the foot everted, some blood was oozing from the wound, and he said that he had lost a good deal before he was admitted. An attempt to examine the extent of injury being productive of intense pain and additional hæmorrhage, I put him under the influence of Chloroform, and then ascertained that the femur was communicated and splintered in the upper third: conceiving amputation to be necessary, I requested Dr. Balfour, and other Medical Officers of the Staff, to examine the wound; they concurred that the operation was necessary. Some delay was caused by waiting for the consent of the friends, without which he would not submit: They arrived, and made no objection; so having again brought him under the influence of Chloroform. I proceeded, with the assistance of my brother Officers of the Field hospital, to amputate the limb at the upper third of the thigh, by antero

posterior flaps. I found on completing the anterior flap that the bone was much more seriously injured than I had imagined; it being comminuted and split up through the neck into the joint: I therefore completed the flaps, and separating them higher up to enable me to get at the head of the bone, I removed it, and the whole limb with some difficulty. The shortness and irregularity of the fragment left attached to the head, caused great difficulty in its removal, but I effected it without much loss of blood or time, through the excellent assistance I received. Having sponged out the city & County, and the numerous clusters left by the operation, and tied 5 arteries and the femoral vein (the latter I was reluctantly compelled to do); I brought the flaps together when all bleeding had ceased, with half a dozen sutures, and placed the patient in his bed, with cold water dressing applied to the stump: he had

been kept throughout the Operation under the full influence of Chloroform. Though he did not lose more blood than in an ordinary amputation of the thigh, he became very low on the table, and at the completion of the Operation his pulse was barely perceptible; however, on being placed in bed and stimulants given, his pulse gradually rose, and when I left him after 3 hours it had risen to 140. On examining the limb, the bone was found to be split in the upper third and many small fragments, one of which extended through the head of the femur. The preparation was subsequently deposited with another of a similar character, taken from a man who had received very much the same kind of wound, but refused to submit to amputation and ultimately died of exhaustion, in the Museum of the Medical College of Calcutta.

The case progressed favorably, with the

exception of a slight attack of Diarrhœa on the 20th, which readily yielded to simple treatment, until the 4th of April when symptoms of Tetanus made their appearance. The stump had been healing rapidly, the ligatures had separated, and the discharge was healthy in character; a slight quantity coming from the interior of the stump had precisuse by an opening in one of the flaps, the result of the original shot hole. When death occurred the stump had healed all but in one or two spots where the sutures had been. There was no tenderness on pressure, and no evidence of any internal mischief. The shot wound had been kept dilated to allow of free exit to the discharge. Should any accumulate. — Tetanic symptoms made their appearance on the morning of the 4th, after a very restless and troubled night, during which he had been in great alarm from a drunken man

who had been brought in during the night, and had wandered about the hospital tumbling over the beds, and alarming the patients - He said that he had been in a state of constant terror throughout the night lest he should injure his stumps, and that this had caused the symptoms that now presented themselves.

The tetanic symptoms at first yielded to treatment, of which Tinct: Cannabis Indica, Mist: Opium were the chief elements, with Fomentations, Turpentine Enemata, Soothing applications, Belladonna Fomentations to the stumps, with counter irritant along the course of the Spine - I was very hopeful at one time that he would have done well, but he sank from exhaustion on the 17th April after a redoubled and more vigorous attack - To the last the stumps looked well, and excepting the aperture of the Rectum had almost completely healed.

The body was examined, as the friends wished it immediately after death, waiving many objections to any post Mortem Operations -
The Case is described in detail, in the 1st Vol: of the "Indian Annals of Medical Science". I have, for the sake of brevity, given only a resumé of it here —

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Case No 2 - An Officer, between 60 and 70 years of age, received a severe wound in the hip during one of the Blockade actions near Donabew, on the Irrawaddy, in the last Burmese war of 1853 - The limb was much lacerated, and the thigh bone Comminuted. He was sent to head quarters as soon as possible, but did not come under regular treatment for two or three days after the wound had been inflicted, great part of that time having been consumed in his transit to the Field Depôt Hospital -
This Case terminated fatally within

a few hours after amputation at the hip-joint; but the circumstances attending it were as unfavorable as they had been favorable in the previous case. The patient age, his long residence in India, a Constitution impaired by exposure to the vicissitudes of Climate, hardships, fatigue, and anxiety during the operations on the banks of the river, where shelter from sun and rain were rarely to be obtained, and where forced marches, bivouacs, and the constant anxiety of the harassing warfare with a crafty enemy, had more or less impaired the physical energies of all. He had moreover undergone the additional fatigue of his journey to the hospital. On examination, it was ascertained that the head, neck and upper part of the femur had been comminuted, the muscles much lacerated, but the femoral vessels were uninjured. There was much swelling & pain

and distortion of the limb. Such had to be used from the stiffened dressing applied when the wound was received, and from the accumulated dirt and discomfort of two days in a hot and damp climate. Whilst examining the wound, the presence of a foreign body was detected amongst the swollen and lacerated muscles: by a little manipulation, a rough beaten iron ball about the size of a small nut was extracted, it was enveloped in a part of the trousers: one would wonder how it had remained without detection when the wound was first temporarily dressed upon the field: but such cases have occurred before. Amputation at the hip joint being the only chance of saving life, it was performed by Mr Beaton and rapidly as soon as possible. The incisions were made so as to secure the best possible flaps that the lacerated state of the soft parts would admit of.

The vessels were managed and secured as in the former case; little blood was lost, and under the influence of Chloroform the patient got well through the operation: he seemed easier and free from pain after it: but he became completely collapsed, and gradually sunk, & died a few hours after-

Case No. 3. A man of middle age, robust frame, and healthy constitution was admitted into the field hospital at Ramoor, in a gunshot wound of the upper third of the right thigh. The ball had passed through, fracturing the bone into several pieces, high up through the trochanter major, but had not injured the great vessels or nerves. He was admitted two days after the wound had been inflicted, and was suffering much pain from the inflammation and swelling about the wound, but there was very little constitutional disturbance - The wound was carefully

examined, and as either amputation, or excision of the head of the bone, appeared the only chance of saving life, an operation was proposed, but he at once, and subsequently, steadily refused to submit to anything of the kind. All that could be done under the circumstances, was to allay pain and irritation, and to place the limb in the easiest and most favorable position. He struggled manfully for 8 weeks, discharging incredible quantities of pus, and occasionally pieces of bone from the wound, but finally sank from complete exhaustion at the end of about the eighth week.

After death, the bone was found to have been fractured in the neck, and for a considerable distance down the shaft, much comminuted and several pieces separated and lost in the purulent discharge. Nature had made most vigorous efforts to repair the mischief and in any other part

of the body I believe, would have been successful. Quantities of bone would have been formed about the upper part of the shaft and trochanters, and the bone altogether presented a most singular appearance; from the bone thrown out about the fracture, I feel confident that had an operation been performed in this case, the patient would have had every chance of doing well: he was a favorable specimen of a race peculiarly fitted by their simple temperate and active mode of life, to sustain the shock and subsequent trials of a severe surgical operation; he was placed in most favorable circumstances, with good food and sufficient shelter, it being at a time when we were supplied with all necessary comforts and appliances for the sick & wounded, and well lodged in a comfortable building. This was a case where the fracture was too extensive to admit of excision,

and too near the head of the bone to have admitted of amputation at the trochanter, as the fracture extended through the neck. Had I operated, not knowing the exact extent of the injury to the bone, I should have commenced the operation with the view of amputating at the trochanter major, but prepared, if I found the injury too extensive to admit of that proceeding, to amputate at the joint: And this I believe to be the proper practice in such cases, where the extent of injury to the bone cannot be positively determined before you have laid it bare: for it is impossible to estimate with certainty, in a simple fracture round of the femur near the hip, the amount of injury done to the bone: it may be fractured by a ball that has not passed through it, and into large and long pieces, especially if struck in the shaft; a small bullet may bury itself in the trochanter and there remain;

or it may pass through the bone, splitting it into innumerable fragments. These are the more common kinds of injuries, especially since the introduction of the long Conical bullet, for altho' it sometimes happens that a musket ball will produce a simple fracture, I believe such cases to be rare. The fracture may extend up the neck of the bone without any of the usual symptoms of that injury being presented: for the fibres employed in bone will sometimes support and keep it in position. Such injuries have occurred, and only subsequently been detected by the purulent discharge, and great Constitutional irritation they have excited. The Capsular ligament may also be opened without the joint being injured, and such cases, it is said, may recover - I have never seen results very probable, I should think, that an Amputation would sooner or later be the consequence of such a wound.

Case No. 4. Lt. H. L— aged about 56, was struck by a fragment of a bursting 8 inch Shell, on the thigh, in the morning of the 2nd July 1857, during the early part of the defence of the Lucknow Residency. He was lying down at the time when the Shell fell and burst in his room, the piece struck him on his Couch.
I saw him a few minutes after the wound had been inflicted, and found that the piece of Shell had entered the outer side of the thigh near the hip joint; passed completely through, lacerating the muscles and comminuting the bone to a great extent, no vessel of importance had been wounded, and the bleeding was trifling. He was pale, cold and prostrated by the shock, but perfectly sensible, and under the impression that he was at the point of death. I examined the wound and ascertained the extent of the mischief: the muscles were much lacerated, and the upper half of the femur shattered to fragments.

Other Medical Officers examined the wound and joined in their opinion that the injury was mortal and that amputation was out of the question. I concurred in opinion that the fracture extended into the pelvis. From the debilitated state of the patients health, resulting from long residence in India, and from chronic disease of old standing, the extreme state of prostration, and the extent and severity of the injury, with the probability of injury in the pelvis, I also was of opinion that it would not be desirable to amputate.

The only treatment therefore was palliative, supporting the strength, and alleviating pain as much as possible by Opiates & Chloroform occasionally administered. He remained perfectly sensible until a short time before his death, and was able to give very important advice and instructions respecting the defence of the garrison, and other matters of great interest.

He nominated his successor to both civil and Military duties, and repeatedly asked how affairs went: he was in a most critical position and under a terrific fire. Round shot passing through the house in which he was lying, Rifle bullets in the garden, and bullets falling like hail.

He suffered at times from severe and painful Contractions of the lacerated muscles, but at others was Calm, Composed and Comparatively free from pain: he died from exhaustion on the morning of the third day. Had amputation been performed in this case I am satisfied that it would have been speedily fatal, even had the wound been confined to the thigh bone. The shock was so great, the reaction so imperfect, for tho' sensible and able to talk and give directions, the vital powers remained very low: his debility & extreme Constitution and general health so ~~Extreme~~ that operation wore out of the question.

the subsequent loss of nearly every case in which a great Operation had been performed owing to the Scorbutic and unhealthy Condition into which all the Garrison had degenerated from bad air and want of food, exposure, fatigue and anxiety, satisfied us afterwards that had we Operated on the faint chance of thus saving life, the Operation must have been ultimately fatal and that thus the instruction and advice which were given during the last few hours of his valuable life would have been lost

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Case No. 5. A young man aged about 25 years was struck by a round Shot during the Siege of Palermo in 1848, on the right hip, (apparently having first ricocheted) and thus been somewhat diminished in the velocity of its flight. The Muscles of the upper and outer part of the thigh were torn away, and the thigh bone crushed to fragments. There was little or no haemorrhage, the Shock and Collapse were extreme: he retained his consciousness till almost

of pain had gone; he was able to speak in a low, barely audible voice, expressing his wishes and sensations clearly: he had no pain, but was quite blind, perfectly cold, and only conscious of life (to use his own expression) above the waist. I gave him stimulants and did all I could to induce reaction, in the hope that I might by amputation at the hip joint afford him a chance of life; but he never rallied sufficiently, and died about two hours after receiving the wound: his skin remained cold and clammy, pulse barely perceptible, with occasional twitching of the muscles, to the last