On

Excision of the Hip joint

a

Thesis for the degree of M.D.

by

Robert Kink, M.B.

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Surgical operations at different periods of the past have from time to time appeared either more or less to have become ignored by the generality of Surgeons. Amputation, for instance, before the ligature was invented was looked upon as so excessively dangerous that many surgeons even of considerable eminence never performed it, or if they did but only through gangrenous points, after the introduction of the ligature however it rapidly became practised and was considered the most perfect of all operations. Now however it shows, according to a well known surgical authority, only the very great distance between our science and the perfection in our art at which all should aim.

Excision and resection and excision of portions of bone and of joints are all advances towards our goal, and the successes, which have attended each of these operations show that as our science gets older it also gains ground. Many of the results, no doubt, can be ascribed to the great care in after treatment shown in enforcing pers.
fect cleanliness— a result due in great measure to the labours of Lister. Lister, for not only does the antiseptic method rest on cleanliness as its foundation, but it also compels, as it were, every surgeon, who does not agree with the theory, to be as careful in this respect as possible, so as to be able to bring forward statistics which can compare to advantage with those obtained by the former method.

Now Statistics are the only means of judging whether an operation is justifiable or not; and on this account the method of after-treatment must be, almost as much as the operative treatment itself, taken into account when judging of the merits or demerits of a special operation. Again they depend very much on the class of cases operated on, whether the patient be still in health or wasted by disease, whether in the regenerative time of youth or in the frailty of old age, whether in a patient of healthy parentage or in one of syphilitic or stunted family history. Such a statement at first sight seems unnecessary, but nevertheless it is a fact which demands some little attention, because if a surgeon operates only in cases in which youth, strength, and a good family history combine to give him all the chances possible for a successful operation surely his statistics will compare very favourably in point with those of a colleague.
who does not choose his cases but who operates only
in those cases which have gone on so far as to leave
operation the only chance of recovery. The mortality
by such a procedure must of necessity be high but
in this case every recovery is clean gain while in the
other list an expectant treatment might have been
the means of affording equally good results. Now
these remarks bear very especially on excision of joints
and they throw much light on the relative mortality
statistics of various schools. As an instance in point
the excision of the Knee joint may be taken, and by com-
paring the statistics of the English and German schools
it is found that in the former the mortality is very
much lower and the results much more successful as
regards the utility of the limb than the latter.
This fact according to Prof. Volkman being simply due
to the English surgeons operating early before the strength
of the patient has begun to suffer from the toxic or the
other results of long continued discharge, whilst the
German surgeons past off until the bones are ex-
traordinarily involved, the soft parts are infiltrated with
inflammatory products, that internal organs are affected
by amyloid or fatty degeneration and the patient's
flushed cheeks and thin, glistening pulse show him to
be already the victim of hectic.
A more frequent instance however is the operation which I have chosen as the subject of this thesis—the excision of the hip joint. An operation which, although most successful in Germany in the hands of such surgeons as Langer, Beck, Volkmann, Billroth, and Schulte, in this country—the land of its introduction—is still looked upon by many of our highest surgical authorities as a proceeding which can only be sanctioned in so small a number of cases as to be practically unwarrantable. But if we look more closely at these cases we find that those in which, in this county, excision is decided upon, are usually very unfavourable ones. That indeed the patient is far reducible and the disease has extended far into the femur and wide into the pelvis. We will also find that the German surgeons above named usually operate whenever the patient is evidently losing ground and thus they are enabled to remove the whole of the diseased parts and thus to place the patient in as favourable a condition as possible for recovery with a useful limb; and of course all the cases are not so favourable and even in those when the acetabulum is diseased, when the cavity of the pelvis is opened into and that most dreaded complication pelvic abscess is present, where indeed certain death is the result if the disease goes on unchecked, excision has been performed by them often.
with amazing success. In these latter cases the statistic
of necessity appears to be most unfavourable, but then is not
every successful case, doubly successful? Is not every such
case a triumph of our art? And if besides life the surgeon
can also give a useful limb, is not this all the more reason
why the patient should at least have the chance which
even a most dangerous operation can afford.

The conditions in which this operation is practicable
are chiefly those of canes and gunshot wounds but
occasionally, as in a case of Mr Holmes to which I will
again refer, necrosis of a portion of the neck of the femur
may be an indication for the operation. As to the path-
obology of the former I need say nothing, nor need I enter into
the diagnosis or treatment of the disease in its earlier
stages as it is not until suppuration has taken place
in the joints that the question of excision can or ought
to be raised. Even then the prognosis as to recovery is
not very unfavourable especially in children and a con-
servative treatment may give an excellent result; but
in adults the case is different as, under a conservative
treatment, the result is usually fatal. Happily the
disease is rare after the age of puberty, so rare that
the various indications or contra-indications to be
mentioned will be only in reference to the disease
as it occurs in children.
Diseases of Children 2nd Ed. p.463.


Science & Art of Surgery 3rd Ed. Vol. II.
And first as to indications.

Mr. Holmes says: "Some surgeons (as Tuck) say that the operation ought to be performed as soon as caries can be certainly ascertained. I myself believe that the rule should be beneficially applied to the class of hospital patients with whom we have to deal. I think, however, that the operation should always be recommended when along with caries there is progressive diminution of the general condition, and at the same time an immunity from visceral mischief."

Miller holds rather different views, and says: "Thus an case, however, in which the propriety of resection may be not unreasonably entertained, when, in an open state of the joint, after spontaneous dislocation, the head of the bone seems to cause much excitement in its new site; when there is good reason to suppose that the disease has all along been chiefly limited to the head of the bone, leaving the acetabulum comparatively uninjured, and when it seems probable that, after removal of the head, if the femoral neck might be restored to the joint, and a certain degree of useful motion might be regained."

Eichstein is of opinion that: "It is impossible not to be struck with the strange inconsistency of those surgeons who, looking upon caries of the bones entering into the formation of the hip joint as necessarily fatal, yet condemn as im.
Chirurgische Pathologie und Therapie. 1876. p.582
proper the only means of saving the patient's life viz. the
excision of the diseased osseous structures, and blame
others for performing an operation which has saved the
lives of numerous patients afflicted by a disease which they
themselves have declared incurable."

"When the morbid action extends to the osseous structure
and the Acetabulum such as the rents of the ischium & pubis
the body and the tuberosity of the ischium and the upper
lip of the Acetabulum and even the Borm of the ilium, the
disease usually proceeds more of the nature of necrosis
than caries and is perfectly incurable except by operation.
In such extensive pelvic disease as this, natural means
are quite unable to effect a cure and the patient must
die of hectic or intermittent disease unless recourse be had
to excision of the head of the thigh bone and the whole of the
involved and carcinoseous structures."

"Billroth says "In other cases a tubercular condition some
arises, which runs its course with anaemia, disturbance of the digestion,
and ends with wasting degeneration of the internal organs or tuberculosi
of the lungs, so that one cannot think of cure under
these general constitutional conditions. If one in such instances
lets the disease advance quietly, the patient succumb either
sudden or later, so much sooner the larger the affected joint
is (Knee, Hip) and the greater the number of joints affected,
as is not seldom the case. There are two means, in the
Hbd. 5:86.

Principles of Surgery 3rd Ed. 2:60
cases which still may help. 1. to remove the limb to save the life, that is to amputate. 2. to give up the cure of the diseased joint, to cut out the diseased bone so as to retain both limb and life, that is to make the resection of the diseased joint.

"In cases of the shoulder, the resection is less dangerous than disarticulation at the shoulder joint, with the hip joint the same holds good. the disarticulation of the hip is one of the most dangerous operations, the resection of the head of the femur is in young patients not so very dangerous. At the shoulder, hip, the question cannot be one of disarticulation on account of cases, the only question of issue is, is the general condition such, that one can let the disease run its course, or will we attempt to cut short the progress by resection. In the most favourable cases and those in an unfavourable position follows; if the recovery is after resection, the extremity generally remains movable in the shoulder a help, the limb in favourable cases fairly useful. But although this testimony is given in favour of certain indications, there is another side of the question in which views are stated which are more or less at variance with the quotations I have just made.

Sykes in his "Principles of Surgery" states: "When the disease goes on to destruction in adults, the case may be considered nearly hopeless, as caries then almost always ensues and being stated in a part where excision cannot be
Lectures on Surgery 2nd Ed. Vol II. p. 56

Manual of Surgical Operations 3rd Ed. p. 126
performed, inevitably proves fatal to the patient soon or
late. In children the chance of recovery is much greater,
but the limbs in this case remains small rigid and distort
ed, the toes being turned sometimes inwards, sometimes
outwards. Prof. Spence in the last edition of his work also
looks unfavourably on the operation. He says: "I think that
looking to the pathology of morbus coxaneus, and the
extent to which the acetabulum is generally affected at the
stage in which we would be warranted in abandoning other
curative measures and recom
mending excision, I doubt whether we could ever be sure of
removing the whole diseased structure. In other words, whether
we could effect what I have stated as the paramount object
of excision of the joint. — I cannot recollect of ever having
seen a specimen of morbus coxaneus where the acetabulum
was not affected and generally to a great extent."
Dr. Bell in his manual says: "From an extensive experience
in a special hospital for hip disease, when fresh air, abun
dant nourishment, and very excellent nursing are provided,
the author is learning more and more to trust to the power
of nature in the cure of even very advanced cases of hip
disease in children, and he believes that operation is rarely
necessary, or even warrantable, except for the removal of
sequestra."

Such then are the views of the Edinburgh school as far as the
writings are concerned, and they also express the views of a num
city of British surgeons. Certainly all those whom I have quoted ought to be greatly pleased with the success which they have had by the expecto-
tive and treatment, but undoubtedly some of the cases have gone wrong.
and if life has been saved, it has only been at the expense of the
utility of the limb, and if the utility of the limb is impaired, then also are its functions. Its growth is retarded, it muscles
atrophy, and if to this we must add the disadvantage of its
being fixed in a useless position, then the patient would have
been better far without it. But even with all this, this result
in bad cases of disease, in cachetic patients, is a good one and
in saving the life we must put the preservation of limb out
of the question altogether.

But if a means is given whereby, with it may be some extra
risk, we can be sure of relieving the pain, can cut short the
treatment, can remove the disease and give the sufferer a limb
of some use—in some cases almost as useful as the healthy
one—of a limb with some freedom of movement. And if this is
free movement at the hips then do we have the spine straight
and the lordosis and deformity which very generally follow
the spontaneous curve is prevented.

Now as to the indications for the operation and a question
faces us at the very beginning. When are we to think of an
operative treatment? Certainly not in the first stage of the
disease, certainly not till supraspinous has occurred and
even not necessarily then. If supraspinous itself, although
of course more unfavourable to recovery than simple effusion, 
can not as yet, and I doubt much if it ever will, be looked upon 
as a symptom demanding excision. Mr. List's views are that 
"if there is suppuration without an external opening, I am bound 
to express my strong conviction in favour of merely opening 
the abscess. I know of numerous cases in which the abscesses 
have been treated antiseptically, and in which the patients 
have recovered." Even if suppuration has occurred, if the 
abscess has burst or been opened and fistulous openings 
remain, excision need not be at once decided on especially if 
the discharge is not profuse. The pain is slight, the temperat 
ure remains constant and the patient's general health does 
not become affected. But if this state of things changes and 
the discharge becomes more profuse and the evening temperature 
rises then one of the operative procedures ought to be determined 
on at once. These are scratching out the sinuses and fistulas 
with the sharp forceps, or excising the joint. Which of 
these proceedings is best suited for the individual case, 
it is impossible to say until the patient having been 
anesthetised the various abscesses have been opened and all 
the tracks been carefully examined. Indeed if the temperature 
varyations were not excessive, and the pain not so deplorable 
as to point at the mischief being really in the joint cavity 
itself. I would consider it right to give the patient the chance 
of recovery after scratching out all the diseased tissues possible.
and the progress of the case would then be closely observed as to whether or not the discharge diminished and the temperature fell. If the symptoms became less severe, perfect rest would of course be enjoined, so as to allow of the deep tracks closing up and the joint itself gaining every chance of healing — recovering.

When, after time the parts again come to a standstill, the granulations becoming fully and the parts infiltrated, renew an again be laid to the abscess spoon without the least fear of wounds the healthy tissues, because it is impossible, if can be taken to injure tissues which are of normal firmness. The mode of using the spoon, which Volkmann has introduced, is different according to whether the part to be operated is an abscess or a fistula. In the former the spoon is only drawn over the surface, after the manner of a brain-brush, until all the pyogenic membrane is removed; in latter the movement ought to be of a cork-screw-like character and some force may be applied so as to remove thoroughly the diseased structures which be deeply.

Of course when this procedure is applied on several occasions very much the same state of affairs is brought about as after excision and as the shock of the operation is not slight, the gain to a delicate or worn out patient is proportionately great. Indeed the patient with the exception of feeling more comfortable need not know, need have no idea that an operation has been performed and the quiet part of the
Disease removed.

When in Berlin in 1877 I watched a case in the "Städtischen Krankenhaus" under the care of Dr. Max Schiede; the notes of which bear directly on this point.

A. B. aged 12, was admitted in the end of May suffering from two fistulas over the outer aspect of the left thigh. The leg was semiflexed and fixed, but the trochanter bone a normal relation to Schiede's line.

Notwithstanding careful nursing and plenty of good food the discharge continued, the temperature remained about 102° F. and Dr. Schiede therefore determined to explore the fistulas by means of the sharp spoon. The patient being anaesthetised the whole of the thigh and hip was thoroughly cleansed with carbolic acid. The fistulas were then scooped out and were found to lead to the great trochanter a piece of which, rather larger than a split bean, was removed in two pieces. The cavity in the bone was thoroughly scraped and washed out with a saturated solution of chloride of lime. A small drainage tube was inserted and an antiseptic dressing was put on. From this time recovery was very rapid for three weeks when the granulations were found to be weak and the fistulas were again scraped out but this was very easily effected as they had closed up for more than half their length. The same treatment was employed and the patient was dismissed cured.
Volkman, Lewis, 2 Hs.

a fortnight later. The chart on the opposite page shows at a glance how the temperature was affected by the operation.

Of course it will at once be said that this was not a case of hip-joint disease at all, but that it would most likely have affected the joint if more than probable seeing that there was fluid present in the joint as shown by the position of the limb. Indeed I do not for a moment doubt that had the case been allowed to go on without operation it would have shortly presented all the symptoms of Volkmann's case—Anna Künze of Potsdam—in his paper on excision of the hip.

But if scooping fails or if the exacerbation of symptoms is great, then excision of the joints should be at once performed and the patient thus be given the only chance of recovery. And the sooner the operation is performed in these cases the better will be the result, whether as regards limb or life.

Excision ought to be undertaken when in a case, originally a chronic one, and without any exacerbation, the dry granulations, which have filled the acetabulum, and almost without any symptoms, did their mischief, suddenly give way and with high increase of temperature an acute suppurating condition sets in.

Caries atra—the dry form of caries—seems to be much commoner in Germany than it is in our own land, because there it
is one of the most frequent affections of the hip joint and it is in this situation of anywhere that the disease occurs in its most exquisite forms. Here the whole joint may be destroyed, the head and neck of the femur gone, the acetabulum filled with a mass of granulations, without a single symptom, except perhaps atrophy of the limb, which would point to anything like the amount of destruction which has actually taken place. Again the neck may have been gradually absorbed by the granulations, and the head left attached by a cicatricial band to the acetabulum. In either of these cases if an examination be made it is only too easy to notice the shortening and distortion, too easy to discover that the whole of the joint is destroyed. In these cases then when a sudden rise in temperature accompanied by severe pain and swelling point directly to the hip joint no time should be lost in excising the joint as although the prognosis after excision in these cases is very unfavourable still more so is it when the disease is left to nature.

When however the disease has not been of such exquisite a type when some small abscess has formed, when a fistula has opened to the joint, then is the excision done due to the spread of the suppuration less marked, the subsequent course less acute and the chances of recovery after operation much greater. In August 1877 I saw Prof. Volkmann operate on a case of the former kind the notes of which are as follows.
| Day | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
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B.C. a well-nourished peasant girl eleven years of age was admitted on the afternoon of the 5th August suffering from high fever and acute pain in the right hip joint.

For about a year she had limped when walking until about a fortnight before, when she had to give up walking altogether. The limb was only slightly flexed on the body, it was slightly inerupted, but the shortening was well marked and the muscles of the thigh were atrophied. The left thigh measured 1/2 inch more than the right one. The temperature on admission was 103°, the pain was very acute, the tongue dry and the general condition of the patient shewed a serious state of affairs to be present

Next morning an examination under chloroform was made when the joint was discovered to be quite disorganized and the excision was at once determined upon and carried out. In the joint cavity being opened a quantity of pus escaped, containing a large quantity of debris, consisting mostly of granulation tissue and minute particles of bone.

The cartilage of the head of the femur was gone and the neck and head were much reduced in size.

Antiseptic dressings were applied to the wound and every thing looked very favourable, the temperature had fallen considerably, the wound was looking healthy the pain was gone. A week after the operation however, the temperature without any evident cause rose to 102° again, the discharge became more purulent, discharge set in and the patient
and exhausted the days after the operation.

The post-mortem examination showed that even then the greater portion of the wound was covered with granulations, and that the discharge evidently had been set up from a loose piece of bone in the acetabulum. There were a few small abscesses in the lungs, and the intestines were much congested.

As an example of the second class of cases the following one, which was under the care of Dr. Israel of the "Institute Montenardino" in Berlin, may suffice.

C.D., a Jewish boy aged 6 years, had been in hospital some months when I saw him first.

When about three years old he fell off a stool on his right side and the same evening complained of a little pain in the hip. No notice was taken of it for a considerable time although the boy was observed to run about much less than formerly and to limp a little. The limp continued and increasing, according to the mother, even at an "■■■■■■" day, she claimed was peculiar and out of sorts. About a month later a small abscess broke and the fistulous opening continued to discharge a little pus until and after his admission to hospital. On admission the limb was put up in the extension apparatus and the progress he was making was considered satisfactory, when in the very hot weather his appetite began to fail, his bowels became loose, his temperature rose. The wound too began to discharge more faeces, which was of an ichorous nature. Prof. Langenbeck, the operating surgeon, to the institution
saw the case and determined on operation.

The parts removed were very extensively diseased, the head of the femur being represented merely by a small nodule the size of a bean. The neck was also much diseased but the section below the great trochanters showed conclusively that the disease was confined to the neck of the bone. The acetabulum was also diseased but the various portions were very easily removed by the gouge and sharp spoon. The cavity of the joint was filled with a considerable quantity of granulation tissue some of which was of a hæmorrhagic nature.

The limb was put up in extension and the wound dressed anaesthetically. The sinuses were scraped out in the course of 2 or 3 weeks when again a considerable quantity of unhealthy granulation tissue was removed. On leaving Buda in August he was still under treatment but he was able to move about with a crutch and only one pistol remained open. The discharge from which was very slight.

The chart of the case for a week before the operation and the ten days succeeding it is appended.

From the state of the joint as seen at both operations there can I think be little doubt that in both cases the disease was incurable by expectant treatment, and certainly in the second case where the patient was for a considerable time in hospital the disease could not be said to have come to a stand still far less to progress toward cure, and this with all the advant...
Volkman to Evison of the hip.

S.P. Society, Winter, 1876, p. 401
days of careful nursing, absolute rest, and good diet. In such
cases then although the prognosis may not be very good for oper-
ation, it is much worse for the expectant treatment and in the
acute forms of any the operation if successful may be considered
as a triumph of the act while if it fails unsuccessful it will still
relieve the pain, and make more comfortable the little sufferer.

Another indication for the operation and one which is more
than any other, considered by almost all surgeons as the chief in-
dication for excision of the hip joint is dislocation of the head
of the femur, after suppuration has destroyed to a greater or less
extent all the structures about the joint, and when the head
of the bone lies as it were in an abscess cavity. These dislocations
is no indication for excision however for the cases which are
most amenable to treatment are those of dislocation or at least
when dislocation may occur. They are those inflammatory con-
ditions, without cavities, which under suitable treatment tend to
spontaneous cure. For instance the effusion in rheumatism
from a typhoid or in the exanthematic or even after injury,
may push the head out of its socket and as soon as the dislo-
cation takes place the inflammatory symptoms subside.
These dislocations permit the trial of a reduction and Volk-
mann has succeeded in reducing a number of them with
very good results.

The diagnosis of these conditions is not difficult on the
history of the case both before and after the dislocation has
occurred, being almost of itself a sufficient reason for founding our opinion on. Very different indeed is the case with those dislocations from the same cause which accompany osteomelitic processes in the upper end of the shaft of the femur. They are brought about by one of two conditions, either the suppuratation may have extended from the shaft to the joint, the head of the bone being more or less destroyed, or almost certainly a fatal condition, or the suppuratation may have merely extended to the trochanter or even to the neck of the femur producing, only on account of the proximity of the joint, an acute exudative inflammation or caraboidal suppuration which effects a dislocation of the head but after a while with greater or less severity. In this region more than in any other is the diagnosis between these two states, these two forms of osteomelitic infiltration or suppuratation, most difficult. The depth at which the joint lies, and the masses of bone which surround it, and the facilities which the fascia lata for drawing away the soft parts make the diagnosis at times impossible.

In cases of cancer then when the femur is dislocated and the head lying in an abcess cavity, the operation right to be performed. The dislocation may be due to a variety of causes, the head may be more or less destroyed by the disease, so that only a stump remains, or the head may be quite separated by disease from the shaft, in either case the femur is drawn up under the muscles, or the acetabulum may be
widen and shortened and the femur may remain in its socket but as far above the anterior line as to make the surgeon sure that dislocation has occurred in each of the cases, treatment by excision is certainly indicated. And in these cases the operation is a comparatively simple one and the results most favourable. The foreign body is removed, if the head is detached; the capsule and surrounding parts are removed and the limb gets every chance to become a useful one, if the head is in situ. And although recovery is not to be regarded as hopeless under conservative and expectant treatment, still the chances are very much greater after excision. Among the poor indeed when the disease has reached the stage of abscess with dislocation of the head. I have no hesitation in saying that in over ninety percent the children die for the very simple reason that they cannot get the food, the nursing or the medicines which the wealthier classes can afford. There is not accommodation in our hospitals to treat all cases by the expectant method and the generality of the working classes cannot be expected to pay for surgical skill extended over a period not of weeks, or months, but years. It is therefore only a very small percentage of the cases, and these generally bad cases which linger on for a year or more in our hospitals and which either succumb or recover with a deformed and shortened limb, a limb, which may be quite useless, in always very short and which is never so useful as that after an only moderately successful excision.
Another indication is perforation of the acetabulum and the sooner the operation is performed after this state of affairs is diagnosed the better for the patient, indeed the Halle school, with Volkmann at its head, considers this the most urgent of all the indications for excision of the hip. Without the operation the patient cannot possibly recover with the operation the chances, although small, are infinitely greater not only as regards the life but also the possibility of having a useful limb. Here the statistics are as far as percentage goes very bad but then every case is one of clear gain and although the deaths should be as ten to one is not there always the possibility that your case will be the one that your patient’s life may be saved? Volkmann says: “As soon as we are able to diagnose, and principally by the more sudden appearance of an iliac abscess that has, has found it’s way into the pelvic cavity by perforating the acetabulum, we must excise the joint immediately. The prospects of ultimate recovery, however, are in these cases very slight, which is also shown at the post-mortem examinations, where we mostly find an intrapelvic suppuratation, a laying bare of the bone, and curious distinction on the inner surface of the faucial, ischiatic and iliac bones.”

A question then naturally crops up. How does perforation of the acetabulum take place? Is it always of the same nature? What are the factors involved?
In young subjects the perforation usually occurs through suppuration of the Y-shaped cartilage. The component parts of the acetabulum are thus separated and the condition may be diagnosed by the mobility and crepitation. Then again in cases of the acetabulum, the pressure of the head of the femur may by its constant character and the irritation thus set up, gradually thin its walls until in one or more places minute perforations occur.

A third and rare form is that of fistulous openings caused by the long continued suppuration in the joint. The most serious of these conditions is the first and this not only from the very nature of the disease but also from the extent to which the perforation usually extends, and the necrosis which generally accompanies it.

But another most important point is the rapidity with which the perforation takes place, preventing that inflammatory thickening which a barrier against the spread of the suppuration—taking place. The soft parts of the pelvic walls thus lose a most important protection, and every facility is given the fangs as it boring among the muscles, and bringing about a state of matters which must surely lead to a rapid termination.

In cases of the acetabulum whether combined with necrosis or no, where indeed the long continued irritation of the parts has caused an inflammatory exudation with the formation
a dense layer of fibrous tissue the parts seem to have been more or less prepared for the perforation, and the bruising is more or less checked. The formation of abscess is in this case a constant, although it is decidedly a most serious complication, still it cannot by any means be considered as a necessarily fatal one.

So far for diseased condition, the traumatic need not occupy much time. As I mentioned before they are chiefly cases of gunshot wound in which primary excision of the joint is indicated. The operation in this case is still in its infancy and as far as the most distressing results have been obtained, indeed whether the conservative treatment be excision, the summary treatment by amputation, or the expectant treatment be employed, the results are equally bad, so bad that but a very small proportion of cases survive and this not perhaps as much from the severity of the operation on the accident, but from the want of proper care which is a necessary accompaniment of every great battle bestowed upon the patient.

When a wound has been diagnosed as being one of the hip joint one need not go on at once to resection, for although some surgeons still hold that inflammation and sepsis of the joint after an injury are always fatal this can be no doubt that the number of cases which recovered during the Franco-Prussian war was a very considerable one. Still it is not advisable to let the patient's strength sink too far.
before the operation as the chances of a successful issue would then be sadly impaired. Before the operation is considered as necessary, or according to others even indicated at all, five incisions must be made when abscesses form, and prevent given by drainage and by these means healing may be brought about without leaving a frame to an operation always a difficult one and in cases of fracture of the neck and splitting of the head often an exceedingly tedious one. Indeed excision, according to the general view of military surgeons, 13. Achilles and Billroth among the number, ought only to be indicated by the condition of the patient, by the injury to the head of the bone or by secondary disease of the bone.

The cases of injury to the hip joint suitable for excision must be rare, because it must be a rare case in which the head of the bone alone is smashed, or fractured, and in which the pelvis is not more or less extensively involved, or the soft parts so much torn as to give the patient little chance of even surviving the shock. Ochs, in his classical work has collected 85 cases of excision for injury, and of these 4 recovered equal to 10.58 per cent.

In the circular No. 7. issued by the Surgeon General of the U.S. Army, Washington, 1867, will be found statistics of in all 161 cases of gunshot injury treated by amputation at the hip joint and of these only 18 recovered or 11.2 per cent. So that these statistics are slightly in favor of excision.

Wagner of Königsberg had a successful case during the Bohemian
Handbuch der Krieger Chirurgie
Leipzig 1872.

Über die Schusswunden der Hüftgelenke
Archiv für Klinische Chirurgie
Vol. XVI p. 264.
campaign of 1866. The progress of the case was exceedingly tedious, abscesses formed, and a bed sore on his back necessitated the patient lying on his face for some months.

The case was of course not treated by antiseptics and the condition of the patient was at times anything but comfortable. Subjected as he was to an almost constant change of attendants. Even when he had as far recovered as to leave his bed and move about on crutches the limb proved more of a nuisance than a benefit as it was quite useless for locomotion, allowed indeed only passive movements. As is customary in Germany the patient was exhibited before a society but all the members were of opinion that it was quite useless as a fixed joint had resulted. But as the patient's health recovered the limb seems also to have improved as Neuburger reports six years later, that he could without a stick and without difficulty walk on any ground and go up and down stairs. A result which must have been as satisfactory to the surgeon as it was pleasing to the patient.

Langenbeck, who perhaps has seen more cases of shot wounds of the hip joint than any other, sums up thus: "If we look over the history of military surgery past or present, the result is far from satisfactory, we find, that the shot wounds of the hip joint are exceedingly helpless injuries, and that the wounded, by whatever treatment adopted, with the rarest exceptions succumb."
Holmes gives under the title of "rare conditions especially suited for excision" a diagram of the head, neck and trochanters of a femur removed from a girl, aged 11. It shows a large cavaneous cavity situated in the neck, within the joint, but leaving the whole of the articular surface free. At the bottom of the cavity is a piece of disused or rather necrosed bone not yet loose. In such a case there can be no doubt that excision gave the patient the best chance of rapid recovery. He also quotes the notes of a case where the neck separated both from the head and trochanter and excision was had recourse to with a satisfactory result.

The indications for the operation stated above are often found in each of these cases, and indeed it is only by the indications that one can judge when the operation is to be performed or not: the diagnosis of such a state of affairs can not usually be made with certainty although one can read symptoms which would distinguish it from a case of ordinary hip disease.

Now as to the contra indications to the operation.

The first of these is cavities of the acetabulum spreading to the neighbouring parts and this only in a contra indication when so extensive that the surgeon cannot remove the greater part of the disease. Indeed one surgeon may consider a case hopeless and the operation unwarrantable, while another with more experience and more tact might think the operation not only a possible, but one that might be performed with some
chance of success. The sharp spoon is an instrument of the most valuable kind in such cases, allowing the operator to remove a very large diseased surface without a necessary large incision and without injuring the soft parts.

But aside from this unless the patient is very much exhausted the operation in these cases may do good although the whole of the disease is not removed. One of the most common factors in keeping up chronic joint diseases is the pressure and contact of the diseased surfaces, and there can be little doubt that many cases of hip joint disease recover after excision, when the whole of the disease was not removed, may when the disease was extensively developed both in the femur and pelvis and this most probably on account of the diseased surfaces being wholly separated from one another, and the consequent irritation allayed.

But the indications, which are received from the abdominal and thoracic viscera are very much more serious than the above, and first, as to the lungs, the organs most commonly affected... If the lungs give evidence of tubercular deposit even in the earliest stages of tuberculosis, I would consider it a contraindication to the operation as far as the expectation of cure is concerned. But even this would not may should not deter the surgeon from operating in a case where pain was the chief symptom, preventing sleep and exhausting the patient.
In some few of these cases the wound promises to heal kindly, occasionally does heal, the general health seems to recover, but sooner or later the mischief advances in the lung and death results.

Waxy Liver and Kidneys are alsoperhaps even more so than phthisis a contra-indication, for before the disease has so far advanced as to be diagnosed, the chances of cure are indeed small.

Hectic alone I do not consider a contra-indication, I would rather judge it as an indication for immediate operation as long as the patient is not exhausted. An examination of the viscera however in this case more than in any other is necessary, because the flushed cheek may be due only to the discharge from and irritation of the joint on the one hand or it may be due more especially to the diseased visera.

Another general consideration is the age of the patient. Here I think is one of the most cogent of all the indications, because above puberty the patient recovers so rarely after excision that I do not think, unless in most favourable cases, that the operation is justifiable and not only from the immediate results but because in the most successful cases, as the surgeon thinks, the patient is generally cut off in the course of a year or two. Childhood then is the age during which excision of the lungs should be performed, in adults the chances of success do not justify an operation.
Before speaking of the operations which have been proposed and are employed still a few remarks as to the anatomy of the joint may not be out of place. I know that the anatomy of the articulation has been studied by such men as Bigelow and it would be presumptive on my part to affect the discovery of some grand anatomical fact, nevertheless I do not think that sections of the joint have had so much attention devoted to them as their importance seems to warrant and on that account I have taken the liberty of affixing the photograph of a frozen section of the joint. On looks at the section from aboone and the chief parts of the section are sufficient ly well brought out. Unfortunately the long railway journey from Vienna to Hamburg and the rough passage across to Leith has not improved the section as regards the more minute points, but the general relation of parts is very well drawn. The comparative superficiality of the joint through the depth of the round ligament, the arrangement of the capitular ligament and the relation it bears to the neck of the Femur are all well seen. The chief value of the section lies in the pelvic portion, and one sees at A how that when the Acetabulum is thinnest the layers of muscles and fascia protecting the fabric viscera is of very considerable thickness, so that in the event of a slow perforation of some inflammatory thickening took place, there would be very little probability of the abscess bursting into the
pelvic cavity. The relations of the rectum, prostate, and bladder are also shown, although the edge of the section of the bladder in the posterior position is not so sharply defined as I might have wished.

A point too which bears directly on the operation and the relative ease with which the operation is performed in children is the comparative shortness of the neck, and the comparatively small size of the great trochanter, which is also until the eighth year more or less entirely cartilaginous. The joint in front of the trochanter is therefore much more easily cleaned in children and the elevator more easily used than in adults. A small artery, of irregular origin, and not constant as it may arise from the sciatic or the obturator is the only vessel which may, when of some size, cause considerable annoyance and trouble, as it occasionally gives rise to some considerable hemorrhage.

As to the operation itself, Ignot, Scobert, Rives, White and Langenbeck all advocate different incisions, devised according to varying principles. One operation is performed from the front because the head of the bone is most superficial there, another has a crucial incision to give the operator plenty of room, a third has the incision running round the upper border of the great trochanter, others have flaps, and lastly a single linear incision has been recommended. Which of these is freshest from
objections? Which comes nearer the ideal operation by which all is effected with the least possible detriment? Which allows of the easiest and best after-treatment? Which is the safest for the patient and calculated to give the best results? These questions must be answered, and that satisfactorily.

The Velpeau incision encircled the outside of the trochanter, passing round the superior edge of the great trochanter and divided besides the insertions of the muscles attached to the great trochanter and trochanteric fossa, a considerable portion of the glutaeus maximus. The edges of the wound and the divided muscles are then drawn apart by means of broad hooks, and the capsule is opened transversely to a great an extent as possible. The ligamentum tertium can then be divided, if division is necessary by introducing a fine narrow knife from behind. The head of the bone, or as much as is judged necessary can be removed with the chisel or fingers saw.

Gruber's incision is a semicircular one extending from the inferior anterior edge of the great trochanter backwards, upwards and then forwards to the superior anterior edge thus encircling the whole of the posterior edge of the great trochanter. It is a modification of Schedeletti incision which is also a semicircular one and which bears its flaps directed forward instead of backward.
The crucial incision over the great trochanter needs no description.

Koss's incision is a horizontal one, extending from the external edge of the anterior crural nerve and passes outward, dividing the rectus, the sartorius, the tensor fasciae femoris, always and if the wound is needed of greater extent dividing a still greater number of muscles. The joint certainly can be easily got at and the head of the bone easily removed, but if the amount of bone to be removed is great, the operation presents many difficulties.

As to Langenbeck's operation. The patient being laid on the healthy side, the thigh is flexed at an angle of 45°. A straight longitudinal incision, beginning on the middle line of the trochanter, is made in the axis of the femur. This incision if extended upwards would pass through the superior posterior raphe of the thigh. The length of the incision varies from 1 ½ to 2 inches and two thirds of the incisions lie above the trochanter. The incision is made boldly down to the bone and a periosteal elevator, if the muscle be fat, is carefully inserted beneath the periosteum on either side and the gluteal muscles with their insertions into the are carefully separated. In the same manner the muscles attached to the anterior and posterior surfaces of the trochanter and the capsule of the joint itself are separated from the bone while at the same time preserving their relations to the periosteum. The head
and neck of the femur now lie with their upper and lateral aspects free, and by abduction of the limb, air easily enters the joint cavity. The ligamentum teres is now divided by introducing a thin straight knife from behind and outwards, and the head of the bone is easily dislocated. If the great trochanter is to be removed the peritoneum must of course be removed to a corresponding extent if the head and neck only a chain saw must be employed and in this case of course little of the peritoneum need be raised.

Thus we see that there are quite a number of operative procedures, many of which have very grave objections on the face of them. The first four operations have all one serious objection and that is that they divide common vascular fibers and remove the attachments of other. Sédillot's operation besides does not give the facility for drainage which the other operations do, and free drainage is one of the chief points to be observed in the after treatment. Ross's operation if Sédillot's is bad, in this respect is infinitely worse. It also divides most important muscles and after all does not give free access to the joint. Indeed Ross's operation is I think only war.

In cases where the head is lying loose in the joint and a sinus is present in front, in this case however the operation divisible done merely to the enlarge.
ment of a sinus. Laney's method has fewer objectionable characteristics, the incision being in the line of the muscles does not divide the fibres, the periosteum with the muscular attachments of the weight of the muscles is saved and in young patients holds out the chance of a reformation of the bone which has been removed by the operation if not also by disease. The chances are which this operation holds out as regards the strength of the limb operated upon are infinitely greater than by those operations in which the muscles are divided and in which extension must keep the divided ends at a considerable distance from one another. On these accounts the operation may be recommended but there are one or two circumstances connected with its performance which must also be stated. No doubt in cases of disease in children the thickened periosteum is removed from the bone very easily, indeed I have on several occasions seen Prof. Volkman remove the greater portion with his finger nail; but in cases of injury Prof. Langenbeck himself admits that it is a most tedious and difficult undertaking, but at the same time he affirms that the result of his operation is a very superior one to that of any of the other operative procedures.

He also states that his endeavour in all excisions is to make the wound as nearly as possible that resulting from a simple compound fracture, or in other words to remove by means of the knife as soon as remains of a synovial membrane.
The treatment of the patient after operation is, however, of as much importance, almost of more importance than the operation itself, and it is perhaps for this reason that so many different methods have been and are still employed to describe one half of which would more than fill up a moderately sized volume. Machines have been invented for the purpose which would have graced an Inquisition chamber, as complicated in their mechanism that no wonder it is that they have been laid aside, while the simplest of all is the weight and pulley, so simple as to appear beneath the notice of many of the more fashionable surgeons. Nevertheless the weight and pulley will ultimately. I have no doubt, sufficiently vindicate its claim to general use. I will therefore describe more minutely the mode of treatment by this means and glance shortly at those by splints and galvanism.

The indications for after-treatment in excision of the hip joint are rest, free drainage, free access to the wound without disturbing the patient, and each method of treatment must be examined in relation to these.

For the first three or four weeks after operation, the surface of the femur must be kept well apart from that of the acetabulum and the limb ought to be abducted by this means the much dreaded adduction is prevented while there is no fear of the parts being too lax against the case by weakness, even more
unfavorable cases, after operation, in the end prove very successful ones. The keeping separate of the parts also allows the bone to take on a healthy action and a healthy crop of granulations in opening up while it also gives other things being equal, free vent for the discharge. To obtain these results, however, rest is essential, absolute rest of the parts and the weight and faulty can be so nicely adjusted as to give this result in an exquisite degree. Nay more it allows the patient considerable latitude of movement as far as the back is concerned and thus aid very materially in the prevention of bedsores. The drainage is also preserved, for if extension be employed the jerks cannot pull up the wound, and as there are no part of the apparatus which can possibly come in contact with the wound, as there is nothing hard pressing against it, this method as far as drainage is concerned leaves nothing to seek.

And so as to the point it plays in free access to the wound for as far as regards the extension apparatus the wound is as free as on the operation table.

By the splint method at the very first we have an objection to it in the difficulty of adjustment which is so often experienced. Rest is ensured but to be effective the long splint and its modification must extend into the axilla, the whole body must be kept at rest and the risk of bedsores is thus one of the greatest hindrances to this mode of
treatment. The comfort of the patient is also a matter of little importance and in this respect the splint comes far short of the extension method.

Then again unless a window be made in the splint, the pressure on the whole of the outer aspect of the thigh acts injuriously as far as drainage is concerned and at the same time affords no access to the wound.

The least satisfactory of the three however, is the plaster of Paris method. Here rest is obtained by fixing the whole pelvis and thigh in a plaster of Paris case, in which a large window is cut to allow of access to the wound. Some surgeons even make the case include the upper part of the sound thigh. Whichever way the case is adjusted after a short time the whole becomes loose and the femur slips up so as to block the wound, or the case itself either blocks it up or by pressure on the parts slips up and an amount of irritation as to prevent the patient getting rest or even to prevent healing. Thus in the most important consideration - absolute rest - the Paris plaster method leaves much to be desired and from what I said as to its blocking up the wound as regards drainage, the same conclusion may be arrived at. The window of course allows of free access being had to the wound without any moving of the patient and therefore the followers of this method have supplemented it with that of extension and so combined both results, but with no
greater benefit than if they had given up the practice altogether.
As to the dressing to be employed every surgeon must judge
for himself between the antiseptic and other methods.
It would be silly and I feel for me to advocate either plan
as no school is as yet at one on this point. Langenbeck
goes in for “use and wot” and Boekeloo has an antiseptic
system of his own which however is almost as inefficient
as it is unique. Volkman and his school are strong
upholders of the new method and Billroth is at present
giving it a thorough trial before he will finally adopt or
neglect it. What holds good in Germany also holds good
both in France and here. Although supporters are getting more
numerous to the antiseptic method. Cleanliness and
through drainage must be observed, whatever corner is adopt-
ed and the more attention given to these points will give
in the long run the better results.

A very great difficulty, which must be faced in every case,
is that of allowing the defecation of the patient without
interfering with his immobility. Volkman generally
employs a mattress composed of four pieces - two large
end pieces which fill up the bed with the exception of about
nine inches corresponding to the region of the buttocks and
two smaller pieces nine inches broad and half as long
as the breadth of the bed to fill up the space completely.
Such a mattress does for either limb joint and by draw.
ing aside both small pains. defaecation is permitted without
disturbing the patient. Another apparatus which the same
surgeon uses is a frame by which the patient is lifted com-
tpletely off the bed by means of a network of strong tapes. But
the disadvantages of this method are greater than any that
which can be said in its favour.

Enward occasionally employs only half a matress, fixing
the legs in plaster of Paris and slinging them up from
the centre downwards, but such a procedure can only be
guaranteed when the patient is extremely restless.

A form of mattress mentioned in a late number of the
'Medical Times and Gazette' and called the universal invalid
rubber water and air bed - would seem to be the best yet
made to allow of defaecation and dressing without the patient
being in consequence in the way least. The tubes can be
emptied singly and withdrawn without the others necessarily
changing position in the very least.

When the wound is so far healed that the patient is able
to go on crutches, a couple of splints, jointed at the knee, and
fixed on the boot, and on a circular ring for the support
of the buttocks - should be employed for some considerable
time so as to keep the weight of the body off the still weak
joints. The crutches must be gradually given up and
a stick used and Lastly the side splints can be put
aside when the limb is strong enough to bear the body.
This brings me naturally to the immediate results of the operation as far as the utility of the limbs is concerned and although different surgeons have very different results which will be noticed when we speak of statistics still we can here in a few words give the general results of the cases which recover. About half the number can walk about without a stick, about three eighths need a stick and only about one in eight need crutches or an unsatisfactory. Of course there are many helps which must be looked to as for instance raising the seat of the boot on the operated side, and this must at first be done to a greater extent than the amount of bone removed during the operation.

How much of the femur ought to be removed? How much is an warranted in removing? Is there any difference as to mortality when the great trochanter is left or removed? Is there any difference in the function or length of the limb under the same conditions? To answer these questions satisfactorily is an easy matter, but as each is a question of vital importance, an answer must be given on the operation as a whole.

The femur is developed from one principal ossific center for the shaft and from four epiphyses which appear as follows: one for the lower extremity at birth, one for the epiphysis at the end of the first year, one for the great trochanter in the 4th year and one for the small trochanter in the 13th or 14th year. These
Pacific centi-# however are of very varying importance as far as the growth of the bone is concerned. Indeed the centi-# in the small trochanter and great trochanter do not affect the length of the bone in the very least, that of the head of the bone appears from experiments to be the main centre of growth, or at least to be equally so with that of the lower end until about the fifth year although it may continue active to a very slight degree until its junction with the shaft about the eighteenth year. It is however from the lower epiphysial cartilage that the growth of the femur chiefly proceeds, especially after the fifth year and on this account theoretically there should be little difference whether the head alone or the trochanters should be excised.

When in Halle in the Autumn of 1877 I made a series of experiments on rabbits as regards excision of the hip and I may be allowed to quote the results of these. I took four young rabbits of the same litter, three weeks old, and in two I excised only the head of the femur, in the other two I excised below the great trochanter. I also took four rabbits of the same litter about nine weeks old and operated on them in the same manner. I examined the length of the femur of two of the first series when the rabbits were half grown and the other two when they were full grown. One of the second series died of tuberculosis but the other three lived and their femurs were examined when they were full grown.
The operation in each case was performed by a single longitudinal incision and the skin wound was left quite open. With the exception of the rabbit which died, the whole of them progressed about as if nothing had happened within a week of the operation. The first two rabbits were killed five weeks after the operation when they were just two months old. The joints in both were very much alike, the periosteum below the line of section was thickened and vascular and in the area which had been left small particles of bone could be felt quite easily. A paracentesis was made from the head of the bone to the acetabulum, and allowed very free movement.

In the first rabbit the head only was excised. In the second the trochanters were removed along with it, and the whole amount that excised would be almost three sixteenths of an inch. In the first rabbit from the tip of the great trochanter to the external condyle was exactly 1¾ inch in both femurs. In the second the excised femur was 1¾ inch long and the unoperated one 2 inches.

In the other two rabbits of the same series, the joints excised under the same conditions as the above, when three months old the femurs were as follows. In the first where the head alone was excised, the operated femur was if anything slightly longer than that of the sound side, but after manipulation this was found to be due to a thick fibrous mass which enveloped the head of the bone, and it was then seen that the operated bone was about 1/16 inch shorter than the other. In the second where about 3/16 of an inch had been removed the head of the bone was rounded.
but there was no new head properly so called and the difference in length between it and the sound femur was barely 1/8 of an inch. The difference was made up by the length of the fibrous band between the bone and the acetabulum the most of which was filled up. The result in this rabbit was as good that one could not tell by seeing the rabbit running about which leg had been excised.

In the other series, the half grown rabbits, the head of the femur only was removed in two cases, the whole of the great trochantin, about 3/8 of an inch in the other two cases. Unfortunately one of the rabbits died a week after the operation of tubercular masses in the lungs and liver. The upper surface of the femur was already granulating and the sharp edges of the bone were removed. The tissues round the joint were hyperaemic and the periostium was much thickened. A small bit of removed bone was found in the cavity. The whole of the great trochantin was removed. In the corresponding rabbit in which the head only was removed the appearance were the same as those in the fourth rabbit so that one description will do for both.

In the third rabbit, the head of the femur being removed along with the trochantin, the amount of bone excised being almost half an inch, six weeks after the operation the length of the bone was slightly more than 2 1/2 inches. The sound femur measuring 2 7/8 inches. The head of the bone was enveloped in a very dense and thick layer of white fibrous tissue.
which completely filled the acetabulum.

In the fourth rabbit the head of the bone was not nearly as well enveloped in fibrous tissue but the two femora were almost of exactly the same length. The difference being slightly in favour of the sound side.

The lengths of the femora in the last two cases are diagrammatically drawn on the opposite page.

The most interesting of the last series was certainly the third excision for here the total length of the excised portion and the femur was as nearly as may be three inches while the length of the sound femur was only 2 7/8 inches.

In the fourth rabbit the same holds good but to a less marked extent, as in the 24th series the bones were not so fully developed. The extent to which the periosteum was thickened and the ossous nodules scattered throughout it, which extent was also interesting points to also was the very strong band, which in every case passed from the head of the bone to the acetabulum, filling it up almost entirely.

An interesting point is also the shortening of the femur on the operated side of the last rabbit. Here the trochanters was not touched at all, and yet a very considerable shortening is observable, may not this be due somewhat to the fact that the limb was less exercised immediately after the operation, and therefore the growth and nutrition would also be impaired.
The series of experiments also shows that the growth of the femur was almost if not entirely wholly from the lower end and the last two experiments prove that in this case at least the lower end was the only one from which growth was taking place, as in half grown rabbits this head is usually joined to the shaft.

From these experiments there is no justification in saying that an equally good limb results whether the femur be excised above the trochanter or below it as far as the formation of a false joint, and if new bone is concerned. Indeed if the periosteum is left there is no reason why a considerable portion of the shaft, if diseased, may not also be removed. At any rate the medulla of the bone can be scooped out and the results be quite as good as the most favourable case.

Volkmann indeed says that the best results be ever obtained after excision of the hip joint, and in which the patient made use of the newly formed joint almost as well as of a sound one, was in the case of a boy, where he not only removed the whole trochanter, but likewise gouged out the diaphysis of the bone, which had been affected by central caries to the extent of 1½ to 2 inches.

But the removal of the trochanter presents very many advantages, in free drainage, removal of pressure and certain of leaving removed the whole of the disease. If left it presses into the wound and by its pressure, especially if it oliges ino.
De la veintiún. Correspondencia con caní
1869.
initiates the wound. And this, though perhaps in itself seemingly unimportant, causes a variation in the mortality which is quite striking. Richard Good collected 49 cases of excision in the neck of the femur and of these 30 died or 61.2% and out of 53 excisions below the trochanter 27 died a 48.21% percentage. Lissinck gives the results which he collected as 66.6% and 63.3% respectively.

From all this then it appears that it is quite the same as far as the limb is concerned whether the great trochanter be removed or no, but when the life is looked to, it is very much better to remove the trochanter, that we may remove even a portion of the shaft of the bone and may have as good a result as any one could reasonably expect. Nay more if we look at what the Germans very appropriately call their "Endresultate", or results, some years after operation we can also find that the results are of anything better when the trochanter is removed.

As to the result as seen long after excision has been performed, there is no reason why one ought not to get perfect, i.e. physiologically perfect, joints. For in dislocations of long standing, whether of the knee joint or indeed of any other one, one finds that a new joint surface is formed on the ilium or on the other osseous surface, a surface which quite surrounds the dislocated bone, and which, although occasionally forming obstructions to certain movements yet allows of a perfectly
smooth motion. There is no reason to suppose that the new bone formation should not follow the usual course, and that therefore it should not adapt itself in a more or less perfect degree to the existing acetabulum more especially if this was at the time of the operation free from disease.

But why rest here, may one not follow up the course of the dislocation and see how it applies to the formation of a capsule? In these old cases of dislocation one usually see a capsule firmly adherent to the soft parts, but with a smooth inner surface surrounding the new joint. The new surface may also present a quiet smooth and limpid appearance to admit of easy motion. And if this be the case can we not also look for a capsule of connective tissue bearing a similar relation to the ends of the bone in our artificial joint? And if this is obtained is it not a result far more successful than the most magnificent attempt after amputation aided by the most ingenious artificial limb which the instrument maker can produce? Such a result might indeed be considered a triumph of surgery, properly so called, showing forth perhaps more strongly than any other operation can do that surgery is both a life saving and a limb saving branch of the healing art.

But to attain to such a result one must of necessity have various conditions. In cases where dislocation has been the result of trauma, there is no perfect acetabulum—
in the position of the head, the nearest approach being a slight thickening of the division of the joint. That one may leave a new joint after a resection, a reproduction of bone more or less thorough must take place, and this reproduced bone must be constantly kept in position while at the same time through motion, whether active or passive, a certain amount of movement is given. That this can be possible the muscles, acting upon the joint, with their attachments to the capsule or periosteum must be carefully retained or in other words one can only reach the goal when the resection is conducted thoroughly and painstakingly. This is of course not always possible, but every excision should be made with this aim in view and the results would show that the new result would be well expanded as far as the utility of the limb is concerned.

Unfortunately the best results disappear from the view of the operating surgeon and as a consequence preparations of the new joints are exceedingly rare. Nevertheless as ultimate results of the excision fluid joints and arthrosis - I mean osseous arthrosis - are almost unknown. By attention and wise splinting fluid joints are always useful and the results of the past, for example Wagner's cases, seem to justify the belief that they may even improve so as to deserve a place among the list of most successful cases. If arthrosis should occur, which
is very problematical, it must have been due either to gross negligence on the part of the patient or to sickness and ill health preventing his using the limb. Osseous ankylosis must be extremely rare, although it is recorded in Langenbeck's Archiv for a case in which an osseous ankylosis is stated to have been made by Mr. Holmes. Here, however, exact proof is wanting as the patient was at the time alive and well, and in those circumstances it is by no means an easy matter to determine whether ankylosis is osseous or ligamentous.

The generality of results, as far as the limb is concerned, gives about half in which the limb is useless and is sufficient for locomotion. Rather less than the other half move about easily with a stick and only a very small percentage need crutches. A thick solid cast is always necessary, and if the patient does not use the limb as brought and allows it to hang useless, by this inactivity the nutrition will be impaired and some little apparatus must be employed. The factor always gives to a certain extent, and thus the apparent difference in length may be slight, while the actual difference may amount even to a couple of inches, so that a result of this kind is a very good one. The tibia may be a little shorter than the one on the sound side, but here the difference is usually slight.
and is only due to the impairment of function and vitality.

As to the result on the general health, of course little
can be said. The diathetic peculiarities and family
history of the patient must be taken into account and
calmly considered and each conclusion however foolish
must be refrained from.

There can be no doubt that after spontaneous cure of hip disease
the patient may live to a good old age and enjoy even good
health, and this is the opinion the case the middle in the
disease, for it is not to be wondered at that patients, who have
been long confined to bed, long weakened with discharge, and
rendered irritable from their long wakeful nights, should be
more prone to sink under some allied disease than the
one who has received proper suppuration has begun. It
may be that a traumatic origin may be traced as the source
of almost all cases of hip disease by surgeons who wish it so,
but is then not generally something more? Has not sciaphle
much to do with it? Do it merely a matter of idiosyncrasy
that as many as three of our family should suffer at the
same time from this malady, as noticed by Morawetz's friend?

Nay, if sciaphle were banished from our land hip joint disease
would appear much less frequently and when it did would
be more amenable to treatment. If sciaphle were banished to do
with hip joint disease as a passive cause, it stands to reason
that the surgeon must combat not only with the manifestation
but with the diathesis. Promoting good, codliver oil, iron, iodides and phosphates must be the agents employed to withstand the disease, and to bring the state of the patient’s health to such a state that he will be able to live his own until he has passed the age of puberty. If this must be done in cases that have not undergone operation, it should surely be done more carefully in operated cases, for they have generally been serious cases and in their suppuration discharges have very generally reduced the system. The operation cannot remove the diathesis and therefore it is that so many cases of excision die some few years after operation but one has always the reward, at least of making life bearable and of giving the patient the chance of reaching to a good old age.

Before entering on the subject of statistics especially it is necessary to give a few characteristic cases with their results. By characteristic I do not mean those exclusively which have been successful, but cases which teach a lesson more pointedly than the generality of cases do.

Surely I would be wanting in national pride, and this paper would be very far from comprehensive were I to pass over the first British case operated on by Anthony White. The patient John West when nine years old fell down stairs and bent his left hip. A few weeks after he was observed to limp complained of pain and in short exhibited all the symptoms of
hip joint disease. He suffered much from the disease and more
from the doctors, who expelled him, blistered him and put in
issues paralyzing with these remedies until the bone became
dislocated and the great trochanter was felt far back on the limb.
At the end of three years, after a series of abscesses had been opened
and a number of pieces of necrosed bone had been extended,
the patient was in a state of extreme emaciation, and the
discharge was still profuse. His right side on which he
could alone lie was the seat of a number of ulcers which
still further rendered his very existence depressing to himself.
In the month of April, 1821, in consultation with Mr. Fares,
Anthony White decided to excise the joint.

An incision, beginning an inch above the head of the bone and
carried in its axis to the point where the femur was to be seen
through, was carried through the integument. The muscles
and soft parts were dissected to either side, keeping close as
possible to the bone, and when cleaned this was divided below
both trochanters with a straight saw. The head of the bone had
some adhesions to the acetabulum and these required some
considerable force to break up, but with a spatula in between
the same ends used as a lever, this was successfully accom-
dated. A very small quantity of blood was lost during the
operation. The head of the femur had not lost its original
form although the cartilage was gone, and then was evidence
of superficial caries. The acetabulum had entirely disappeared.
...and there was no evidence of disease of the skin.

Such is Mr. White's case, but the above does not point out the chief difficulties he had to encounter, for it was not the condition of the patient but the opposition of his colleagues which nearly kept him from English surgery. In this early case of excision Mr. White's colleague Mr. Black refused to assist him, but the then member of parliament for Norwich, who was acquainted with the boy's mother, informed Mr. Edward Hume of the proposed operation. He and his colleagues at St. George's Hospital examined the patient and wrote out a statement which they said was the operation would not only be useless, but impracticable and most likely would be attended with loss of life. Mr. White says of this - "I was not present at the consultation and only knew of it by being shown this document or protest by the child's mother, of course after such a published declaration I abandoned the case altogether." Fortunately, however, Mr. Hume saw the boy and being told of the proposed operation he at once wrote to Mr. White offering him his assistance. Backed by such a surgeon, the operation was performed by Mr. White with a result as splendid as the operation was contemptible. Such then is the history of the first British case, which, according to Mr. White's own words, was "for the removal of the pimple as far as it should be found in a lot of cavities" and not merely for the removal of deformity as some surgeon seems to claim it.
Another case of almost equal interest was that under the care of Prof. Volkmann in which both hip joints were excised. During my visit to Halle I was fortunate enough to see the patient who could then walk about with ease on two sticks. At that time he was looking very pale and seemed already to be suffering from the first stages of consumption which carried him off a few months later. The very tender and weak child, of a tubercular family, had suffered for more than two years from a chronic inflammation of both hip joints. The pain was slight, and indeed the chief symptom of disease was the gradual limitation of both active and passive movement. The pelvis was in its normal position, every symptom of suppuration was absent and therefore on account of the chronic course, and the constitutional conditions of the disease, a primary oseous coxitis (primary osteale coxitis) of both joints was diagnosed and expectative treatment was decided on.

In December 1874 abscesses formed for the first time about the left hip joint. The granulations which had certainly been present in the joint for a considerable time (Caries circin.) broke down. There was high fever. The joint became movable and exsanguinated.

On the 20th May 1875, the left hip joint was excised. And yet even before the operation was determined on, symptoms of subacute suppuration appeared also in the right hip joint, and while the operation would heal slowly on the left side, the destructive process advanced rapidly on the right. This joint suppurred, abscesses formed and on the 27th July, ten weeks
after the section of the one hip joint. Prof. Volkmann says, if he would not give up every hope of saving the patient's life, himsely placed in the necessity of the unexampled one, of excising the other hip joint. The very delicate boy, who was referred to the lowest extremity of the suppuration, the repeated opening of abscesses and the long confinement, lived through the shock of both operations. Gradually his health was restored and he began to move about by holding on by tables and chairs, and when he left hospital he could stand without assistance and walk three or four steps; but he was so timorous that he did not care about trying experiments. Volkmann says: "I believe that the question whether locomotion without crutches is possible after double excision of the hip joint is possible, can already be answered in the affirmative."

In this case, on both sides the bone was seen through below the great trochanter, the after treatment was carried out in antiseptic principles. Extension was used and the result is that the limbs have both good movement and the patient can sit comfortably. The excised bones showed numerous small abscesses of varying size in the medulla both of the head and neck and to a less extent in both great trochanters, as also masses of tubercle some of which had not yet broken down. Both hip joints were excised happily at the right time as in both perforation of the acetabulum had almost taken place. In that case the abscesses, which must have formed in the pelvis, would have rendered the prognosis exceedingly unfavourable.
Beiträge zur Chemie.
Leipzig 1875.
Another case of Volkmann's is very interesting not so much from the operation itself but from the accident which was the cause of the patient's death.

A labourer, 18 years old, was admitted to the Halle Clinic in May 1873. He was suffering from a virulent tuberculous inflammation of the synovial membrane accompanied by suppuration. On the day of admission as the symptoms were urgent excision of the joint was performed. The sinuses were scraped out and the articular cartilage was gouged as there was a large, quarter of an inch in diameter corresponding to the junction of the epiphyses behind which was a moderate quantity of pus. The head of the bone was denuded of its cartilage and its surface was much ulcerated.

On account of the bleeding, from the small vessels crossing the neck of the bone a number of sponges were introduced into the wound by Dr. Volkmann, who was called away immediately after performing the operation. His assistant removed as he thought, all the sponges and sewed up the wound. With antibiotic precautions the wound healed almost in its entirety by first intention. Fourteen days after the operation pneumonia with hectic character set in, and was diagnosed as a septicemia of the lungs.

As the fistula now remaining showed nothing special, at the excision there were small nor any other sign of decompression the antibiotic dressing was dispensed with on June 10th.
experience about the same," says Prof. Yollesmann, "was still small, and we held the statement, which was made on all sides, that it hindered the healing of wounds in the later stages, as well formed. Then followed, however, after this change a rapid addition to and decomposition of the discharge, as also a very high evening temperature. Acute military tuberculosis was now diagnosed. Five weeks after the operation on the 19th, the patient died.

At the autopsy there was found in the acetabulum partially covered by granulations a sponge as large as an apple. That had caused a perforation as large as a shilling in the acetabulum and extended, for half its size into the pelvis. How it was covered with a layer of pus so thin that an abscess could not be diagnosed from the pelvis. In the lungs there were about a dozen small pyemic abscesses.

This case is of peculiar interest. The presence of the sponge was borne without any reaction for fourteen days and for a further ten days during which fever certainly developed and the wound was less healthy but there was no decomposition. Had the sponge been found now, the patient had most probably recovered as no abscess was found and even at the autopsy the end of the bone was covered with granulations. The careful counting of all sponges used at an operation both before and after the operation is surely especially indicated by the result of this case.
In June 1857, I assisted Dr. Kirsten of the Augusta hospital at Berlin at a removal of the right hip joint for septic arthritis. The little patient, a girl of eight years, had suffered from the suppurating form of typhoid for more than two years and on admission was exceedingly emaciated, and quite worn out with constant purulent discharges and high fever. With both hands clasped on her knees she tried to keep the limb steady but every movement however slight, every jar of the bed elicited a groan which showed how much she was suffering. Although the chance of recovery was very slight the symptoms were such that Dr. Kirsten decided to operate. There were numerous fistulous openings all around the joint and some over the waist with the history of abscess showed that perforation of the acetabulum had taken place. Langebeck's incision was employed and the femur was drawn through below the trochanter. The acetabulum was removed and almost the whole of it with part of the femur was removed the remaining diseased part being well scraped with the sharp spoon. The knee was extended and the extensor apparatus was adjusted while the child was still under the influence of chloroform.

She slept for some hours after the operation and when she awoke requested to have some coffee and milk and very soon fell asleep again. Next day the discharge was not nearly so profuse as before the operation, the anxious look was gone and the patient was lying comfortably, without the constant dread
of being agitated by the least movement. Her temperature and pulse were both lower but her strength had not increased. In the evening the temperature rose again, and continued to fluctuate until her death six days after the operation.

The autopsy showed the region of the hip to be undermined with abscess tracks. The abscess cavity in the pelvis had extended over the whole of the inner surface of the ilium, and the surface of that bone to be the seat of extensive superficial cavities. The liver was extremely fatty. The lungs had tubercular masses scattered through their entire substance.

The chart of the case is appended.

In the Bethanien in Berlin under the care of Dr. Wilms I saw a case similar to the above whose operation was not until the abscess cavity had resolved to much harm and when the patient was doing well. Eichhorn's case already referred to is also a case in point.

In the Berliner Krankenhaus I also was present when Langenbeck excised the left joint, merely to give the patient ease and more especially as he had removed the right arm some months previously for very extensive cancer. In both cases by the open method, the discharge was removed constantly and the little patient was made as comfortable as possible, but that was all that was looked for by the operator, and the result was gratifying in the extreme.
According to Mr. Hancock, Mr. Barwell was the first surgeon who systematically replaced the floor of the acetabulum for pelvic abscess in connection with hip joint disease when the bone was not perforated. His first case is interesting although unsuccessful. J. H. aged 16, came under Mr. Barwell's care September 14, 1864, very much reduced with long-standing hip disease of left side. There was a large abscess near the great trochanter, and an opening in the inner part of the groin below Psoas' ligament, which discharged freely. An operation was proposed on October 3, but the boy refused, and it was delayed until November 26, when it was considered necessary to save his life, the symptoms being urgent, and the discharge from his groin very copious. Mr. Barwell removed the head and neck of the femur and replaced the acetabulum. The patient rallied for some days after the operation, but the discharge became very copious. On December 3 it had a putridulent odour, and a few days after that pus was found in his faeces. This subsequently increased in quantity, diarrhoea, which merged into dysenteria, set in, and he sank, and died on January 14, 1865.

Mr. Barwell next case, operated upon on May 20, 1864, was in recovery with a useful limb, as the boy could walk about without support of any kind.

But it would be so easy as it is unnecessary to multiply cases. The above are very interesting and instructive ones, and on that account alone claim some attention.
Statistics may be obtained which will prove anything, just as the collector has a mind to go in with the affirmative or negative side of the question and of course in this way they may be of little value, but on the other hand they are the only means at our disposal for the investigation of the results of any operation.

As to the frequency of cases of the hip joint, Professors Billroth and Menge have made very interesting statistics.

<table>
<thead>
<tr>
<th>Disease</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease of the Vertebrae</td>
<td>35.17%</td>
</tr>
<tr>
<td>Skull and Face</td>
<td>14.27%</td>
</tr>
<tr>
<td>Knee</td>
<td>11.42%</td>
</tr>
<tr>
<td>Hip</td>
<td>9.46%</td>
</tr>
<tr>
<td>Sternum, Rib, Spine</td>
<td>9.22%</td>
</tr>
<tr>
<td>Elbow</td>
<td>4.63%</td>
</tr>
<tr>
<td>Foot and Ankle</td>
<td>7.01%</td>
</tr>
<tr>
<td>Other regions</td>
<td>7.33%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Of all Hip cases 10.9 were males or 57.5%.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>57.5%</td>
</tr>
<tr>
<td>Female</td>
<td>42.5%</td>
</tr>
</tbody>
</table>

Of all Cases 11.6 are males or 59.4%.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>59.4%</td>
</tr>
<tr>
<td>Female</td>
<td>40.6%</td>
</tr>
</tbody>
</table>

From the above it is seen that a comparatively large number of cases of cases have the hip joint diseased, and that the proportion of males to females affected is almost.
exactly the same in hip disease as it is in cancer generally, or in other words, that males have no greater predisposition to hip disease than they have to cancer generally.

I have been unable to find satisfactory statistics of the result of hip joint disease when treated by the expectant method, indeed I have got no statistics at all, and indeed it would be a matter of very great difficulty to obtain accurate ones on this subject as the stage of the disease, the age of the patient, and the special treatment would all require notice, as well as the result, which are not always as satisfactory as one would wish.

As to the operation generally the results may be tabulated under the headings of Recovered, Died, Doubtful, i.e. not decided.

Leminek has collected 176 cases all operated on before 1869 and arranged according to the country in which they belonged the results are as follows:

<table>
<thead>
<tr>
<th>Country</th>
<th>Recovered</th>
<th>Died</th>
<th>Doubtful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>85 cases</td>
<td>18 died</td>
<td>5-8 death</td>
</tr>
<tr>
<td>England</td>
<td>42 cases</td>
<td>21</td>
<td>12</td>
</tr>
<tr>
<td>America</td>
<td>29 cases</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Russia</td>
<td>4 cases</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>France</td>
<td>16 cases</td>
<td>2</td>
<td>12</td>
</tr>
</tbody>
</table>
The total results give 56 recoveries, 98 deaths, and 22 doubtful cases, or 32.9 p.c of recoveries, 12.4 p.c. of doubtful cases, and 57.7 p.c. of deaths. The French and German results are very bad according to the above, but those of the latter are now, with greater attention to after-treatment and the removal of the great toxic elements, very much better.

Other statistics have been collected by

Focke who gives the recoveries at 63.7 p.c. the death at 36.3 p.c.
Barmett ... ... 63.9 p.c ... 36.4 p.c.
Lindenburg ... ... 63.4 p.c ... 36.6 p.c.
Sower ... ... ... 63.6 p.c
Le Fort ... ... 59.2 p.c ... 41.0 p.c.
Girald ... ... 42.8 p.c ... 45.2 p.c.
and Heyfeld ... ... 52.3 p.c ... 47.7 p.c.

The above give one only the bare facts as to whether the patient has recovered or not, but there are a few statistics which give the results as far as the activity of the limb is concerned. Dr. Hodge has collected 111 cases of which 56 or roughly speaking one half recovered with more or less useful limbs.

Dr. Wood collected 112 cases of which 52 recovered. 42 of the patients could use the limb in 10 the result is not given. Of the 42, 19 could walk without any support, 9 with the aid of a stick, 1 with two sticks, 1 with a splint, 1 with a crutch, and 2 with two crutches. In the remaining 9
Medical Times and Gazette
June 12, 1872
the extent of utility is not mentioned. But in 40 out of the 52 cases the limb could bear the weight of the body.

Hence again Mr. Hinde has collected statistics of the results of the operation as regards the age of the patient as follows:

<table>
<thead>
<tr>
<th>Age</th>
<th>No. of Operations</th>
<th>Successes</th>
<th>percentage</th>
<th>Deaths</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2</td>
<td>0</td>
<td>50%</td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>1</td>
<td>50%</td>
<td>1</td>
<td>50%</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>2</td>
<td>66.6%</td>
<td>1</td>
<td>33.3%</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>2</td>
<td>66.6%</td>
<td>1</td>
<td>33.3%</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>4</td>
<td>66.6%</td>
<td>2</td>
<td>33.3%</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
<td>5</td>
<td>83.3%</td>
<td>1</td>
<td>16.6%</td>
</tr>
<tr>
<td>8</td>
<td>13</td>
<td>10</td>
<td>76.9%</td>
<td>3</td>
<td>23.1%</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>3</td>
<td>75%</td>
<td>1</td>
<td>25%</td>
</tr>
<tr>
<td>10</td>
<td>11</td>
<td>7</td>
<td>63.6%</td>
<td>4</td>
<td>36.4%</td>
</tr>
<tr>
<td>11</td>
<td>3</td>
<td>6</td>
<td>60%</td>
<td>2</td>
<td>40%</td>
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<tr>
<td>12</td>
<td>3</td>
<td>1</td>
<td>33.3%</td>
<td>2</td>
<td>66.6%</td>
</tr>
<tr>
<td>13</td>
<td>4</td>
<td>2</td>
<td>50%</td>
<td>2</td>
<td>50%</td>
</tr>
<tr>
<td>14</td>
<td>5</td>
<td>4</td>
<td>80%</td>
<td>1</td>
<td>20%</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
<td>0</td>
<td>0%</td>
<td>1</td>
<td>100%</td>
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<tr>
<td>16</td>
<td>2</td>
<td>2</td>
<td>100%</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>2</td>
<td>2</td>
<td>100%</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>3</td>
<td>2</td>
<td>66.6%</td>
<td>1</td>
<td>33.3%</td>
</tr>
<tr>
<td>20</td>
<td>3</td>
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<td></td>
<td>3</td>
<td>100%</td>
</tr>
<tr>
<td>21</td>
<td>2</td>
<td>2</td>
<td>100%</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>2</td>
<td>1</td>
<td>50%</td>
<td>1</td>
<td>50%</td>
</tr>
<tr>
<td>Age</td>
<td>No. of Operations</td>
<td>Success percentage</td>
<td>Death percentage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>-------------------</td>
<td>--------------------</td>
<td>------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>3</td>
<td>2 66.6</td>
<td>1 33.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>1</td>
<td>0</td>
<td>1 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>1</td>
<td>0</td>
<td>1 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>2</td>
<td>2 100</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>1</td>
<td>0</td>
<td>1 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>1</td>
<td>1 100</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>54</td>
<td>2</td>
<td>0</td>
<td>2 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>61</td>
<td>1</td>
<td>0</td>
<td>1 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>1</td>
<td>0</td>
<td>1 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 20</td>
<td>75</td>
<td>3 30 66.6</td>
<td>2 33.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 and above 21</td>
<td>8</td>
<td>3 38</td>
<td>13 62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>5 8 60</td>
<td>18 40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In this Table it is interesting to note how in the tenderest years the operation has not so good results but from forty to the results are very good and gradually as the patient gets older the operation seems to get more unsatisfactory until death is the rule, recovery the exception.

Dr. Hancock says with regard to this table that the fatal cases are rather unjust to the operation than otherwise for among them are classed a patient who died of consumption three years after he had recovered from the operation, another who died of pneumonia seven months after the operation and others who were reported cured but died soon...
after pleurethysis. Of the other deaths one was due to syphilitic, one of sickliness, one of cancer of the rectum, one of Bright's disease, one of enteritis, and four of purpura. In one case the cause was returned, a second died from the ulceration of the femoral vein, and another from the result of the secondary amputation. Other statistics give the time of death in the recorded cases as follows:

In first 14 days after the operation 13.1 per cent. of all deaths.
In the end of the 1st month. 13.1 per cent. .
In second month. 4 .
In first year. 24.4 .
After first year. 78 .

Of 43 cases which have been collected as showing the result of the operation according to the time of operating the results were as follows:

In 1st year of the disease 23 cases with 56.5 per cent. removed.
2nd. 10 . 90.4 per cent .
3rd. 5 . 80.4 per cent .
4th. 6 . 66.4 per cent .

In this table all the cases must have been favorable ones. The patient must have been young, or the fatal cases must have been devoid of information as regards the length of time the disease had lasted. As any rate the numbers are too small to form any conclusions from whatever.
American Circular No. 2.
From these statistics the following conclusions may be drawn as regards the rate of mortality. The mortality differs widely in different countries. It differs according to the age of the patients. The rate in about 1 in three to four.

Different surgeons have very different rates. Volkman had three deaths in 20 cases. Langenbek three in thirteen.

And according to M.G. Grant some have no mortality others on in two, three, four or five, then in four or no recoveries.

In the report on excision of the head of the femur for gunshot injury there are 85 cases collected divided into Primary, Intermediate, and Secondary.

Primary excision.

39 cases 3 recoveries or 7.6% 36 deaths or 92.4%.

Intermediate excision.

33 cases 3 recoveries or 9.1% 30 deaths or 90.9%.

Secondary excision.

13 cases 2 recoveries or 15.4% 11 deaths or 84.6%.

Truly a very dark sheet of statistics which looks even worse when put in the aggregate.

85 cases 8 recoveries 77 deaths or 90.5%.

Still primary amputation at the hip joint presents just as bad results. And the limb is saved in the one case, while in the other, a crutch or if wealthy enough an artificial leg and a stick are the substitutes. Better ambulance and appliances however may give in the future better results.
These then are the statistics and surely no one can say that as far as regards recovery the tables are now drawn for since the antiseptic method has been introduced the result are very much better, and are always getting more favourable as the selection of cases for operation is being made with an increasing precision as to the time when the expectative treatment will fail and the operative must be employed. There can be no doubt that now the expectative treatment is founded on more scientific principles than formerly, that it is more comfortable for the patient, that it gives less risk of boredom, that it gives more freedom and better results. I will grant more, and will go so far as to say that the rule will shortly be recovery, that the exception will be failure. That is certainly a great admission to make, but then in those exceptions, in these failures which will occur, we are to stand passively by and leave the patient to sink without the chance of recovery; which this operation—most bloody and formidable one—that an author has described it as affords? Certainly not but rather let the patient get the benefit before it is too late, let him at least have the ease and comfort which the operation affords, and in this way keeping the operation in its proper place excision of the hip must come to the fore as an operation both beneficent and beneficial, tending to span both life and limb, to restore health and to relieve pain.
I cannot end this paper better than by quoting from the last of Mr. Hancocks's lectures on excision of the hip-joint. "Look at a patient wasted to a shadow, confined to his bed, not for months only, but for five years, in constant pain and in the last stage of exhaustion from long continued discharge; with his leg flexed on his thigh, that thigh drawn across its fellow, or with the knee forcibly flexed and pressed against the opposite thigh; constantly lying on one side, his frame becoming distorted, his chest turned forward, and his hands employed night and day incessantly maintaining a fixed position of the limb, and endeavoring to prevent the intense agony which occurs on the slightest movement, his sufferings still further increased by the bedsores resulting from the constant pressure on the one hip. Often must we all have witnessed this sad scene. Often have I seen the poor hip-joint patient, when all others have slept, still watchful and anxiously engrossed with the one and monotonous task of steadying the knee and preventing movement. Look again at this patient when the operation is performed: his position now is no longer one of constraint and torture, it is one of comparative comfort and rest. He no longer suffers the extreme pain, he no longer exists in dread of the slightest movement or jar, his countenance loses its drawn and anxious appearance, the hectic
subsides, and whatever may be the ultimate result, we at all events have the satisfaction of feeling that by the operation we have alleviated a very vast amount of suffering, almost beyond the power of endurance. Few indeed can there be amongst us who have had any experience of the operation without having observed the great and almost instantaneous relief following its performance and who will not agree with me in feeling that this fact alone is a very strong argument in favour of its adoption.