OBSERVATIONS
ON
FRACTURES
OF THE
BONES OF THE PELVIS.

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FRACTURES and dislocations of the bones of the pelvis must always be regarded as very serious accidents, and are often attended with fatal consequences, from the injury inflicted on the important viscera contained within the bony cavity.

They are most commonly the result of great violence, either from falls from considerable elevations, or from the pelvis being firmly compressed by great weights, or between two opposing forces. The diagnosis of some of these accidents is at times obscure, and the extent of injury cannot be ascertained during life.

Having met with some well marked cases of fracture of the os innominatum extending into the ace-

tabulum, in which the same diagnostic marks presented themselves, and in one of which I had an opportunity of verifying the opinion entertained during life, by an examination which took place some months after the receipt of the injury, I conceive that a short report of the cases may not be uninteresting to the Fellows of this Society.

I am further induced to submit these cases to their consideration, from the circumstance of the most prominent characteristic symptom which existed in these cases having been overlooked by all the authors whom I have consulted on this subject. Sir Astley Cooper, in speaking of these accidents, states that they are liable to be mistaken for dislocations of the femur. It will be seen, in the cases about to be related, that the symptoms more nearly resembled fracture of the neck of the femur. From considering the subject, and the nature of the accident, I am at a loss to understand what species of dislocation such an accident would be liable to be mistaken for. The direction of the force applied would lead to the suspicion of fracture, and the position and direction of the limb would clearly prove that no dislocation had taken place. But it will be better to proceed with the relation of the cases, and afterwards to discuss the phenomena which presented themselves.

CASE I.

—— Booth, aged forty, was admitted into St. Bartholomew's Hospital, in October, 1829, with a

fracture of the pelvis, caused by his falling from a height of thirty feet upon the left side. He had lost all control over the left lower extremity, and could not raise it from the bed. There was no visible shortening of the limb, but the foot was everted. Any attempt to rotate the limb caused great pain, and was accompanied with very sensible crepitus when the hand was applied over the hip-joint. On applying the two hands to either side, with a view to compare the relative position of the trochanters with the anterior spines of the ilia, that on the left side was not nearly so prominent as that on the sound side; it appeared indeed nearly on a level with the anterior spine of the ilium, and could with difficulty be felt. On pressing the trochanters the patient complained of deep-seated pain in the hip-joint. The patient was placed on a double inclined bed, a broad leather bandage was passed round the pelvis and buckled firmly in front, and the feet were secured to the foot-board. Subsequently a bandage was applied round the upper part of the thigh, to press upon the trochanter, and to support the whole more firmly. A catheter was passed, but no injury had been sustained by the bladder or urethra. It was necessary, however, to employ the catheter for some time, as the patient could not empty his bladder without it.

Some days after his admission he had a severe attack of pneumonia, which required active depletion, and which increased a cough to which he had been liable for some time.

No sinister circumstance occurred in the treatment of the fracture, and the patient was discharged in about eight weeks after the receipt of the injury, at which time he could walk nearly as well as before the accident.

Soon after leaving the hospital, he was admitted into St. George's Infirmary, where he died of disease of the chest.

The pelvis was examined after death by Mr. Howship, through whose kindness I am enabled to present to the Society the injured bones. It will be seen that the fracture extended in two directions through the acetabulum ; that there was an extensive comminuted fracture of the ilium, with some displacement ; and that the os pubis was broken in three places. The reparation has been very complete ; and it is interesting to observe how nature has guarded against any considerable deposit of new bone within the articulation, which might have interfered with the functions of the joint, although there is an abundant deposit of callus around the other parts of the fractured bone.

CASE II.

John Samuel Kilpin, aged forty-four, a robust, healthy looking man, was admitted into Harley's ward, on the 29th of August, 1834. He stated, that whilst at work on the previous day he fell from

a height of about sixteen feet upon his left side, and injured his hip and elbow. Immediately after the accident he was able to walk, with pain and difficulty, a distance of about fifty yards. But at the time of his admission he had no power of using or moving the limb.

On examination, the leg of the injured side was slightly everted, but not perceptibly shortened; a fracture of the crista of the ilium was readily detected, which apparently extended into the acetabulum, as a crepitus could be distinctly felt when the limb was rotated and the hand applied over the joint. The whole limb could be moved with great facility in different directions, and in rotation and abduction a sensation was communicated to the hand, as if the head of the femur sank more deeply than natural into the acetabulum, that cavity affording no resistance to the force of the long lever of the lower extremity. On comparing the two trochanters, *that on the injured side was not so prominent, and could with difficulty be felt.* I entertained no doubt of the nature of the case, and directed a similar plan of treatment to be followed as in the last mentioned case. The urethra and bladder were examined with a catheter, and proved to be uninjured. On examining the arm, I found a compound fracture of the olecranon, with much synovial discharge. The olecranon was quite separated from the shaft of the ulna, but there was no disposition to retraction of the fractured portion, which retained its natural posi-

tion in the cavity at the back of the humerus. As there was much tumefaction around the wound, the arm was kept steady at an angle of about 160 degrees, with a pasteboard splint in front of the arm and fore-arm, and leeches and a bread and water poultice were ordered to be applied to the elbow. He was twice bled to the extent of ℥xvj ; and salines with antimony were given, and leeches were applied several times to the elbow.

The case went on most favourably; not a single untoward circumstance occurred, and he was discharged well in about three months, without any shortening of the thigh, and with perfect motion in his elbow joint. The olecranon united by firm ligamentous union which admitted of a slight lateral motion of the fractured portion.

Thesymptoms in both these cases very closely resembled each other; in both, the nature of the injury was the same, namely, a fall on the side. In both, the most marked symptoms were the *loss of prominence of the trochanter*, and the freedom of motion of the joint, particularly of abduction, which is always attended with the severest pain in fractures of the neck of the femur. The nature of the accident was that which most commonly produces fracture of the neck; the total loss of power over the limb, and the eversion of the foot, resembled what occurs after that accident; but there was no sensible degree of shortening, there was greater freedom of motion, and

instead of the trochanter being more elevated and prominent, as in fracture, it was below its natural level when compared with the healthy limb.

The second case was rendered more interesting by the circumstance of the compound fracture of the olecranon,—an accident on which I find all systematic writers silent; but which is of great importance, as involving some practical questions of moment. It is now generally admitted by the best authorities, that in simple fracture of the olecranon the best position to keep the arm in is that of flexure to about 160 degrees, which admits of the divided portions being kept most accurately in contact, without incurring the risk of opening the inner or outer edges of the fracture. But this position would render the limb nearly useless in the event of ankylosis; and as in compound fracture of the olecranon the wound communicates with the cavity of the joint, there is of course some danger of suppuration taking place within that cavity, which might be followed by ulceration of cartilage and ankylosis. Should the inflammation run high, and should there be any risk of ankylosis, it would of course be far preferable, without regard to the broken olecranon, to keep the elbow steadily flexed to a right angle. This is the second case of compound fracture which has occurred in my practice, and both were restored without lameness.

The only practical rule which I can venture to lay down is, to treat the case in the first instance as

common fracture, only by repeated leechings, and a strict antiphlogistic treatment, endeavouring to keep down the inflammation. Should the progress of the case lead to the probability of ulceration of cartilage and ankylosis, sufficient time will be allowed to alter the position of the limb to that of flexure to a right angle. Until such circumstances arise, we are, I conceive, warranted in attempting the more perfect restoration of the limb by keeping the fractured ends in contact.

I have met with two other cases of injury of the pelvis, in which the same symptoms presented themselves. One occurred in the person of a medical friend, Mr. Green, of Marlborough Street, who was forcibly jammed between a turnpike gate and a wheel, in consequence of his horse running away with him. In this case the patient recovered, but halts a little with the affected limb, which is slightly everted, and the trochanter is not so prominent as it ought to be.

The other case occurred lately at St. Bartholomew's. James Cock was driving a cabriolet, and was thrown from his seat in consequence of the horse falling. He fell on his side, and was so immediately deprived of all power of moving the right lower extremity, that he could not stir from the position in which he fell, although in great danger of being run over by a waggon. When examined, it was found that he had no power of moving the limb, and the trochanter was below its level; there was also some

crepitus felt when the limb was rotated. The urethra was examined, but no injury was detected. The patient was treated for fractured pelvis, and recovered in about eight weeks, at which time he only complained of pain near the ascending ramus of the ischium. All these patients were placed on my double-inclined beds, which are particularly adapted to such cases, admitting of perfect rest for the injured pelvis and lower extremities, and every facility for cleanliness and the evacuation of the bowels.

I venture to subjoin some cases of complicated injury to the pelvis, in each of which, circumstances presented themselves of sufficient interest to deserve being recorded.

CASE III.

In the winter of 1833, I was called to a man, between 60 and 70 years of age, who had been riding a young colt without a saddle. By a sudden start of the colt he was forcibly thrown forward upon the withers. He experienced very severe pain, was unable to retain his seat and fell from the horse. When I first saw him, he was lying upon a bed in a very faint, exhausted state, and appeared like a patient dying from internal hemorrhage. There was no external wound, but blood was flowing freely from his anus, and had run through the bed on to the floor. There was great flatness of the pubes, and the pelvis appeared broader than natural, allowing a

greater separation of the upper part of the thighs. On placing my hand on the front of the pubes, I found no resistance, and over the symphysis and behind the scrotum, extending to the perineum, there was extensive effusion of blood. I conceived that the ossa pubis were fractured, and apprehending effusion of urine, I carefully introduced a full-sized catheter, which, on arriving at the bulb, took a direction much to the right side, and then entered a great cavity, evidently not the bladder. I immediately made a free incision in the perineum, and let out a large quantity of blood and urine. On introducing my finger, I found that the symphysis pubis had been torn asunder to a great extent, and I felt a smooth projecting body, which at first I supposed to be the distended bladder; but on more accurate examination I found it to be the internal surface of the bladder, into which my finger readily entered, and that the prominence was caused by the pressure of the intestines above. On tracing my finger over the surface, the moment I reached the trigone, the patient exclaimed that he wanted to make water. On repeating the contact of my finger with this spot, he was again most urgent to be allowed to make water. The patient lived forty hours, and on the following day I again gently introduced my finger and touched the trigone, when he again was most desirous of passing water.

On examination after death, the symphysis pubis was separated to the extent of three inches, and the

sacro-iliac symphysis on the left side was nearly separated, and gaped to the extent of more than an inch. The prostate gland had been torn away from the bladder, leaving a large aperture communicating directly with the cavity of that viscus. The urethra still retained its connexion with the ligament on the right side of the pubes, and the prostate gland hung loose in a cavity filled with coagulum. An extensive laceration communicated with the rectum,

This case is interesting in many respects. It shows what extensive injury may follow an apparently trivial accident, when circumstances are favourable to such an occurrence. The man's legs being separated at the moment of being thrown forward, no doubt favoured the accident, and caused the forcible disrapture of the powerful union of the ossa pubis at their symphysis, and the consequent opening of the sacro-iliac symphysis, both of which are generally considered so strong as to admit more readily of fracture of the neighbouring bones than any dislocation at the symphysis. The case likewise illustrates very powerfully the importance of immediately examining the state of the urethra in all cases of fracture or injury of the pelvis, as the only chance of safety is in the securing an exit for the urine, when the urethra is torn asunder. But the most important feature in the case is the evidence which it affords of the correctness of the opinion which has been entertained by

some anatomists, of the mucous membrane covering the trigone possessing a peculiar sensibility, and that the sensation of a desire to make water is first excited in this part ;—a position which at first appears difficult to reconcile with the known fact that this part of the bladder is most exposed to the continual drip of the urine, as it enters through the ureters.

It must be admitted that this opinion receives much confirmation from the well known facts, that when a catheter or other instrument is introduced into the bladder, so as to touch this part, a distressing urgency to pass water is experienced, even when that viscus is empty, and still further by the circumstance, that when a stone is in contact with this part the same urgency is experienced, which is relieved by change of posture and consequent removal of the stone from pressing on this sensitive spot. It is true that these facts have been adduced by authors favouring such an opinion as has been stated above, but in the present case I had the strongest confirmation of the peculiar sensibility of this part, as I repeatedly traced my finger over the other parts of the bladder without causing any particular uneasiness, but the moment I touched the trigone the patient most urgently entreated to be allowed to make water ; thus affording the strongest possible evidence of the correctness of the opinion that this portion is endued with a peculiar degree of sensibility. I was enabled also to ascertain that the mucous membrane at this

part remains quite smooth when the rest of the bladder is thrown into folds.

CASE IV.

A short time after the occurrence of the last mentioned case, a man was brought into the hospital, having been crushed beneath one of the ponderous iron gates at the new Post Office. The ossa pubis were broken and driven in, and there was extensive effusion of blood into the scrotum, and beneath the integuments covering the pubes, and in the perineum. On passing a catheter, with the finger in the rectum, it was ascertained that the urethra was torn, and that there was extensive fracture of the pubes and ischia. The continuous portion of the urethra into the bladder could not be traced, and an incision was made into the perineum, but no urine followed. I was called to him in the evening, and found the bladder distended, but on gently compressing it urine flowed freely through the wound. In a few hours he ceased to exist, and on examination nine of his ribs and the sternum were found fractured, and the lung on the right side was deeply lacerated. There was a large rent in the liver, and much blood effused within the abdomen. A fracture extended through the body of the pubes on each side, and likewise traversed the ascending rami of the ischia. The pubes were greatly depressed, and the rectum was torn across through the muscular part just beyond Camper's ligament, which remained entire. The lacerated

portion nearest the bladder was partially plugged with coagulum, which explained the circumstance of the urine not escaping into the cellular membrane.

The entire separation of the urethra in this case proved the necessity for the free opening which was made in the perineum, which would probably have saved the patient's life but for the extensive injury to other vital organs.

CASE V.

I was called last year to a very powerful young gentleman, who had thrown himself out of a three-pair of stairs window into the area, and had alighted upon his left foot. When I reached him he was obviously dying from internal hemorrhage. His left foot and ankle had sustained much injury: the os calcis and astragalus were broken into numerous fragments, which protruded through a lacerated wound. The whole of the metatarsal bones were separated from the tarsal. The left inguinal and iliac regions were distended with blood, and it was obvious that the bones of the pelvis on that side had sustained extensive injury. A catheter was passed, which readily entered the bladder and emptied its contents. He became violently convulsed, and died in about an hour after the occurrence of the accident.

On examination the whole os innominatum on the

left side was separated at the symphysis pubis and the sacro-iliac symphysis, and was forced upwards to a considerable extent. The common iliac vein on that side had been torn through, and the pelvis was filled with blood. It is worthy of remark, that in this case, notwithstanding the extent of injury sustained by the foot, the force should have been so great as actually to separate the symphysis pubis and sacro-iliac symphysis, and to drive the whole os innominatum upwards, yet that there should have been no fracture of the neck of the thigh-bone nor of the acetabulum. Fracture of the neck of the femur is said to be sometimes caused by perpendicular falls, but I never yet met with an unequivocal case of such an accident.

It will no doubt be observed, that in the narrative of these several cases I have stated that the catheter was introduced, or attempted to be so, in each case. I take this opportunity of strongly urging the propriety of a cautious examination of the urethra in every case of suspected fracture of the pelvis: next to extensive internal bleeding, the most alarming and certainly fatal occurrence, is effusion of urine. The former it may not be in our power to control or obviate, but the latter we may often prevent, and by timely assistance, save the patient. Whenever it is clearly ascertained that the urethra is ruptured, and the catheter cannot be passed into the bladder, it will be right at once to make a free incision in the perineum, and thus allow of a free exit for the urine.

It fortunately happens in many cases that the effused blood compresses the urethra and prevents the escape of the urine, and thus time is allowed for taking the necessary steps, but these should on no account be delayed.

In many doubtful cases of fracture of the pelvis, an examination with the finger per anum will enable the surgeon to detect the nature and extent of the injury.

George Street,
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