CLINICAL LECTURE

ON

A CASE OF FATAL PELVIC INJURY IN A CHILD,

IN WHICH A COLLECTION OF BLOOD IN THE PREVESICAL
SPACE (CAVUM RETZII) SIMULATED DISTENSION
OF THE BLADDER.

Delivered at St. Mary's Hospital,
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GENTLEMEN,—In these days of successful surgery I do not often invite you to go with me to the *post-mortem* room, but when the mortal injury of a patient takes us there it is practically certain that we shall learn something of interest and value, even though it be only by the revelation of our faults both in diagnosis and treatment. I am glad therefore of the opportunity of lecturing upon a case on which the light of *post-mortem* investigation has been shed, and I fully expect that you will agree with me that the case on which I am about to speak this morning is worthy of our consideration from several points of view. I will endeavour to relate the story of the case wholly without reference to what was found after death, and to tell you also at the same time what was in our minds in the matter of diagnosis, and what we did in the way of treatment. And then when I come to describe the treatment which we ought to have employed, instead of that which we did employ, I shall refer to two cases of a similar kind which were in the hospital some years ago, in which life was, I believe, saved by the treatment adopted, and which I am very pleased to have the opportunity of bringing forward now.

The case was that of a boy, aged 7, who was admitted to the hospital on March 11th. He had been knocked down by a vehicle in the street. He was in a state of collapse, and the signs of external injury seemed to suggest that the wheel of the vehicle had passed in an upward direction over his right leg and thigh, and had then smitten him on the right side of the abdomen and chest. A few drops of blood were seen to be trickling from the urethra, and Mr. Hill, the house-surgeon, passed—as he believed—a soft catheter into his bladder and withdrew a small quantity of blood. No urine was drawn off—a circumstance explained, it was then thought, by the fact that the child had passed water only a short time before he met with the accident. At any rate, Mr. Hill was quite clear in his own mind that he had passed a catheter into the bladder—with a certain amount of difficulty, it is true, but nevertheless he had passed it and had drawn off blood. He sent for me, and when I came to the hospital in the course of two hours afterwards the child had very markedly rallied. He was lying upon his side; he was asleep, his pulse was quiet, he was absolutely tranquil, and, as far as external marks were concerned, there was no evidence of grave injury. But there had been the very serious indication of blood from the urethra, and I thought it right to suggest that an instrument should be passed again. Mr. Hill accordingly passed a catheter in my presence and again withdrew a few drops of blood.

Looking at the manner in which the accident had happened, we came to the conclusion that in all probability the child had sustained a laceration of his right kidney, and that the blood came from that source. There was no reason to suspect that the bladder itself had met with any injury; there was no mark or special tenderness about the abdomen, there was no indication of urine in the peritoneal cavity, the respiration was perfectly natural, and, inasmuch as the child's general condition at this time was good, and as also, after examining all over his body, we were unable to detect any other evidence of lesion, we determined to wait and see what time would bring forth and then act accordingly.

In the middle of the night I had a letter from Mr. Hill, telling me that he was not quite clear what he ought to do; that the child's bladder was distended up to the umbilicus, that he had passed a catheter, but had been unable to draw off any urine, and he believed that the bladder was distended with blood clot, by no means an unreasonable supposition,

seeing that we believed the right kidney to have suffered serious injury. I replied that the proper thing to do was to pass a catheter of as large a size as could be got up the urethra, and to move the end about freely in the bladder so as to break up the clot, and then to wash out the bladder until the clot was removed; or if he failed by that method, to use a large aspirator needle above the pubes, and to do the same thing by that route. It was absolutely essential that he should wash the blood clot out, and so put an end to a condition of things which of course was causing a great deal of pain, and making the child extremely restless. And here perhaps I may interpolate a remark with reference to distension of the bladder by blood clot. One meets with it occasionally; in the course of my time, I have seen four or five cases. It is a rare condition, and one not very easy to deal with. The bladder may be distended right up to the umbilicus, and the patient himself of course cannot expel the coagulated blood. I well remember the first case of the kind which came under my notice when I was house-surgeon at the London Hospital. A student had caused profuse hæmorrhage at the neck of a patient's bladder by catheterisation. The bladder became distended with blood clot, and I had to send for one of the surgeons. A large catheter was passed, and the blood clot having been ultimately washed out of the bladder, no harm resulted. But in other cases I have seen greater trouble, and in this hospital one was fatal some years ago. You must in such cases, whatever may have been the cause, get rid of the clot, so as to relieve the patient's condition and relieve the bladder also from the risk of prolonged distension, either by catheter through the urethra, or by some instrument such as a large aspirator inserted above the pubes. And if these measures failed, I should imagine that the best mode of dealing with the condition would be to make a suprapubic opening of sufficient size to enable the surgeon to break up the blood clot with his finger, and then empty the bladder.

Now, I am not going to say more about this particular condition. Mr. Hill acted as I had suggested. Failing to pass a catheter by the urethra, he passed an aspirator above the pubes, and that being too small, a trocar and cannula and then a full-sized metal catheter by the suprapubic opening, with which he succeeded in breaking up the clot and washing it out; so that the child, as far as the bladder was concerned, was apparently in a state not likely to give further trouble. I saw it on Monday, and there was then no evidence of further bleeding—that seemed to have been arrested—but the child was extremely restless, and had a temperature of 102° F. On looking at the wound above the pubes it was obvious that urine was flowing continuously out of it, a fact which we accounted for by the instrumentation above the pubes having taken a considerable time, by the size of the instruments, and by the consequent non-closure of the opening in the bladder. And inasmuch as the urine was clearly escaping by this route, we rested content with this explanation, and were not much concerned. Certainly there was no longer any bleeding or possibility of accumulation in the bladder, and we believed that in the process of time the wound would close, as is usually the case. But the child's restlessness and his high temperature made me question whether our diagnosis had not been altogether wrong, and whether there was anything more that we could possibly do. Hot fomentations were ordered to ease some slight abdominal pain, but the respiratory movements of the abdomen, although not quite as good as they were, nevertheless were not so impaired as to suggest that there had been any injury to the intestines or abdominal contents other than the assumed injury to the kidney. I saw the child the next day (Tuesday). He was then much worse, extremely restless, and practically in a state of collapse again. The temperature was high; he was beginning to wander; there were all the indications of a very serious condition. The only thing of which I could think was this, that as the wheel had injured his abdomen on the right side, in addition to the lesion of his kidney he had in all probability sustained some injury either to the large or small bowel in the immediate neighbourhood. The child, however, was obviously dying, and no further surgical interference was admissible. He died in the course of the evening in a state of collapse accompanied by high temperature.

In the *post-mortem* room we found to our great astonish-

ment that not one of the things which we had suspected had occurred. The kidneys were both perfectly healthy, and had met with no injury whatever; the peritoneum and intestines were natural; there were no broken bones either of the thigh or leg. On opening the abdominal cavity, however, one saw at once that immediately above the symphysis pubis there was a cavity containing a large quantity of broken-down stinking blood-clot mixed with urine. It suggested that there must of necessity have been a fracture of the pelvis, and when the pelvis came to be examined carefully it was seen to have been broken in three different places. Here is the child's pelvis, and you can see that there is a green-stick fracture running across the right body of the pubes, another larger fracture through the left body of the pubes just above the acetabulum, entering into the thyroid foramen and communicating with the cavity which I have mentioned; and, in addition, a third fracture here, a little below the junction of the rami of the left pubes and ischium. Furthermore there was found a laceration amounting to total rupture or division of the urethra in front of the prostate. Mr. Clarke has discovered a minute puncture in the rectum also, and there can be no question whatever, when we come to consider matters, that the urethra had been directly torn and the rectum had been punctured by displaced bone.

You know as well as I do that the most ordinary way in which the urethra is ruptured is by falling astride of something hard, so that the urethra is crushed between it and the arch of the pubes; but the urethra may be lacerated in cases of fracture of the pelvis by actual displacement of bone, and in this particular instance there is hardly room for doubt that bone had been displaced, and that by displaced bone—in all probability the ramus of the ischium close to the urethra—the urethra had been torn across.

Another question which presented itself was this: How had the pelvis been fractured in this peculiar manner? We had thought—I, at any rate, had thought—that the vehicle had run up the child's leg and had passed over his right side. Now was it, nevertheless, that the pelvis had been broken into so many fragments? I have to thank my dresser (Mr. Sumner) for a suggestion which seems satisfactorily to explain this particular occurrence. His observing eye had noticed that the left side of the child's face was dirty and not the right. In other words, it was probably the fact that the child, having been knocked down, was lying on his left side with his cheek in the mud when the vehicle went over him. His pelvis was thus squashed flat from side to side; and so these various fractures were caused and the forcible displacement of the ischial ramus, whereby the urethra was ruptured at this point.

Unhappily there was nothing to tell us that this condition of things existed. A catheter had been passed, as was believed into the bladder; I was myself present, and so believed on one occasion. And I have told you our reasons for thinking that the urine escaped by the bladder route afterwards, and was actually seen to flow from the puncture made by the house-surgeon in the abdominal wall. But the chief interest is this, which was discovered at the necropsy, that the bladder had never been punctured at all. When Mr. Hill in the night, by my directions, endeavoured to wash out the child's bladder by suprapubic puncture his instruments never even entered the bladder. He was every whit as astonished as I was myself when he heard of this. I do not blame him in the least. I feel practically confident that had I come myself in the night to see the child I should have been misled, as he was, by the indications of the bladder being distended up to the umbilicus by the blood which we had suspected came from the injured right kidney. I should have fallen into the same trap as he and have acted in the same manner. And if there is any blame attaching to his mistake I take it upon myself, and shall make use of the legal maxim, *Qui facit per alium facit per se*. Indeed, what really had happened was this: the urethra was ruptured and neighbouring soft parts were extensively lacerated by displaced bone, and blood was effused in large quantities into the space between the bladder and the pubes, into the space which may be called the "prevesical," but which is sometimes spoken of as the "cavum Retzii," after the anatomist who first described it. It was into this cavity, distended, as it was, by blood, that the catheter was passed when it was

believed to have been passed into the bladder. And the blood collected in this place caused dulness on percussion in the front of the lower abdomen, and inevitably simulated distension of the bladder. Moreover, when urine made its way into this same area decomposition ensued, and death from septicæmic poisoning.

It is interesting that just at this moment a paper has been read before the Royal Medical and Chirurgical Society by Dr. Ernst Michels, of the German Hospital, on Prevesical Abscess. He points out how rare the condition is, and how great may be the difficulty in diagnosis, and for this reason, amongst others, that there is the formation of a pelvic tumour which resembles very much a distended bladder.

You see then exactly what had occurred in this patient of our own. Bone was broken and displaced, there was injury to the rectum, and complete rupture of the urethra, and extravasated blood found its way into the space between the bladder and pubes, and there made a cavity into which the instrument was passed by the suprapubic opening when it was thought to have gone into the bladder, and in which the blood increased in quantity until there came to be a swelling of the abdomen, such as to produce the very signs which one ordinarily recognises as those of distended bladder. Here is a rough drawing which Mr. Clarke has made. I will hold it in

the position of the patient as he lies upon his back. Here we have the surface of the abdomen; here is the rectum (R); here is the bladder (B); here is the rupture of the urethra (X); here is the cavity (C) which, as it gradually filled, increased in the upward direction, and led to the empty bladder being pushed altogether out of the way. You see the limits of the large swelling up to the umbilicus (U), into which Mr. Hill passed the instrument through the abdominal wall (O), and so washed out this artificial prevesical cavity. And it is obvious how the blood in that position gave rise to dulness on percussion, and how easy it must have been to mistake it for a distended bladder.

This, then, is the chief point of clinical as well as pathological interest in this extraordinary case, and makes it well worthy of our consideration. We may ask this question: Had we known what actually had happened, that the pelvis had been fractured and the urethra torn, although as I have said the latter injury was suspected when blood was seen to come from the meatus, would the ultimate result have been different? How might we have acted had we known what had really occurred? Doubtless we should have made a perineal opening by which, with a tube in the bladder, we should have been able to divert the stream of urine from the prevesical region, and put it by irrigation into an aseptic condition. And here it is that I may appositely refer to two cases which were in the hospital some time ago, and both of which were extremely interesting and instructive.

The first was that of a boy 15 years of age, who on November 9th, 1887,

was riding on the top of a cart along a road covered with sharp stones. He fell from the cart in a sitting posture, and afterwards as he lay on his back one of the wheels passed over his left groin. On admission he was suffering slightly from shock. A catheter was passed, and there was no blood; he was able to pass water, and there was no obvious indication of mischief about his urethra. There was a wound near his anus on the left side, and with the finger passed into it one could distinctly feel that it had probably been caused by displacement of bone, for there was a sharp-edged fracture with displacement of the ramus of the left ischium. In the course of a few hours urine began to trickle out of the wound, and there was a suspicion of faeces also, and I came to the conclusion that there had been injury by displacement of bone both to the urethra and the rectum, but that the opening in the urethra was not of such a size as to deflect the whole stream of urine, because the boy had been, and was still, able to pass water. And as it seemed to me that if this conclusion was correct we were certain to have trouble because of the extravasation of urine into the ischio-rectal fossa, and it might even be above the pelvic recto-vesical fascia, the proper thing to do was to make a perineal opening, keep his bladder empty by means of a tube, and so divert the urine from the lacerated parts. This was accordingly undertaken, and the need of it was shown by the fact that although the cystotomy was done within thirty-six hours of his admission, there did ensue the most violent septic inflammation, with profuse offensive discharge from the original wound, which had to be much enlarged. The patient had, indeed, to be sent to the isolation ward. It was a long time before the discharge ceased and the parts had closed up, but the boy ultimately left the hospital in every respect perfectly well, with the fracture united, the wound healed, and the urethra restored. I have no doubt that the perineal opening and drainage of the bladder in that instance was the means of saving the boy's life by preventing the spread of sepsis in the pelvis.

The next case was even worse, and was that of a man, aged 30, who was admitted on the evening of Saturday, February 23rd, 1895. He was seeing a friend off at Baker Street Station, when the train started and he fell. He was drunk at the time. It was not known exactly how he was injured, but, at any rate, he was brought to the hospital in a state of great collapse, with a desire to micturate but unable to do so. A No. 10 silver catheter was passed without much difficulty, and 3 ounces of blood-stained urine were drawn off. Nothing was to be felt *per rectum*, but we suspected that there had been some injury to the preprostatic urethra. A soft catheter was tied in. There were bruises about the trochanters, especially the right, but no fracture could be detected anywhere. Examination had been made under anaesthetic. On the following day the patient passed water with some difficulty, but a No. 7 silver catheter went comparatively easily into the bladder. The state of collapse was somewhat long in passing off.

On February 24th, in the evening, it was noticed that the right iliac region was tender and discoloured, and the temperature began to rise. Nothing very special was noted in the course of the next few days except that his temperature was high and he seemed ill, but on March 13th it is recorded that the urine contained pus. On March 16th there was distinct redness just internal to the right anterior superior spine of the ilium, with a suspicion of fluctuation on deep pressure. The bladder was washed out twice daily with boracic acid, but, nevertheless, on the 18th a great deal of pus was still present in the urine, and the smell was most offensive. The swelling in the right iliac region was now more distinct, the redness had increased, and it was extremely tender; there was marked fluctuation.

We now came to the conclusion, which ought, perhaps, to have been acted on before, that urine had been making its way into the prevesical region, and that an abscess had been formed, and was trying to escape by spontaneous opening near the anterior superior spine. On March 19th the patient was anaesthetised and a median cystotomy was performed, while at the same time the abscess was opened above Poupart's ligament. A large quantity of pus escaped, and fluid readily passed from the opening above to the opening below. A silver tube was left in the bladder. Improvement now set in both in the general and local conditions, but the case was complicated later on by a troublesome bleeding as I have ever seen.

On March 27th, eight days after the cystotomy, the act of micturition through the perineal wound, which had for the first time been accompanied by slight straining, was followed by hæmorrhage, which the house-surgeon stopped by plugging round the silver tube, and by placing ice in the rectum. The next morning hæmorrhage was again profuse, and was once more arrested by plugging. On the 29th there was more bleeding, and again the wound had to be plugged. On the 31st hæmorrhage having again occurred, the patient was put under anaesthetic and the perineal wound was explored. It was found in a sloughing foul condition. The bleeding seemed to come from the right side, but no vessel could be seen, and we had to be content with plugging, which once more arrested the bleeding. On April 2nd the hæmorrhage occurred again, and again we had to have the man in the theatre. On this occasion I had the advantage of the presence of Mr. Owen and Mr. Pye. We arrived at the conclusion that the bleeding in all probability came directly from the internal pudic artery itself, and it was necessary to enlarge the opening very freely by incision on the right side, so that the whole ramus of the ischium was exposed to view. Distinct arterial bleeding was now seen from this vessel, and as it was found practically impossible to secure it and apply either a ligature or any effective plug, the only plan left to us was the actual cautery, no easy thing to use in such a situation. It was fortunately successful, and there was no more bleeding afterwards. By slow degrees his temperature dropped to normal, the discharge ceased, and ultimately the patient left with his wound perfectly healed, but having some tendency to urethral stricture, which we dealt with by the occasional passing of a catheter instrument. About two years ago he called to tell me how he was. He had been an in-patient for nearly a year, and he knew I took interest in him. I think he told me he was going out to South Africa, and for all we know he may have been in Jameson's ride.

These two cases throw light upon the line of treatment which ought to be adopted in such injuries, that a perineal opening should be made, first with the object of diverting the stream of urine, and secondly of enabling us to cleanse and

asepticise the perivesical parts in which blood and urine may collect. In the case of the child the treatment which has been advocated was not carried out, and we may fitly ask if it would have given any better chance of life. After the terrible injuries it had sustained I do not know that drainage by any opening could have saved its life, but it would have done something towards lessening and preventing the risks of septicæmia. Furthermore, do not forget the fact which the case exemplifies, that blood—pus for that matter, if you will—which has made its way in large quantities into the pre-vesical space, may push the bladder aside and give rise to the indications which are commonly attributed to a distended bladder, and so lead to grave error in diagnosis. How wrong we all were in this case the incontrovertible evidence of the *post-mortem* investigation has told us, and we must derive such consolation as we can from the fact that the injuries were mortal from the first, and from the hope that the lessons we have learned may help us to more successful treatment in the future.

APPENDIX.

As the surgery of the prevesical space receives but scant notice in our textbooks, it may be of use and interest to refer briefly to some of the scattered papers upon the subject. It appears that Retzius, a Swedish anatomist, first described the space before the Academy of Stockholm in 1856, and that Hyrtl in 1858 brought his communication before the Academy of Science of Vienna.

In 1880, an exhaustive treatise on the surgery of the space was published by Dr. G. Bouilly in a thesis entitled *Les Tumeurs Aiguës et Chroniques de la Cavité Prévésicale (Cavité de Retzius)*. The author refers to several cases of injury as well as disease, and points out how distension of the space may readily simulate a distended bladder.

In the *Annales des Maladies des Organes Génito-Urinaires* of November, 1892, is a paper by Dr. Noel Halle, *Des Péricystites*, dealing with inflammatory exudations and suppurations around the bladder, some owning an origin from cystitis, some due to mischief in neighbouring intestinal or genital structures. He refers to the lax space in front of the bladder as one in which effusions of fluid may collect.

In the same journal for January, 1893, is a paper by Dr. E. Martin, of Geneva, *Note sur un cas d'Abscess de la Cavité de Retzius*. He says that tumours in this region may exactly simulate the form of a distended bladder.

In the *Gazette des Hôpitaux* of November 24th, 1891, M. Guyon writes on *Les Collections Liquides Prévésicales*, and therein points out how in one of his cases the swelling due to serous effusion greatly resembled a distended bladder, but three symptoms helped in the diagnosis, to wit, the outline of the tumour, which was irregular at the sides, the fact that rectal examination failed to detect any bladder distension, and that no urine could be drawn off by catheter.

In the *Wiener medizinische Wochenschrift* of 1891, Nos. 42 to 46 inclusive, is a series of papers by Dr. J. Englisch, *Ueber idiopathische Entzündung des Zellgewebes um die Harnblase in Cavum Retzii*, full of most valuable information on the subject, and containing copious references.

In the *Medical Record*, April, 1895, p. 461, Dr. Eugene Fuller writes on the Clinical Symptoms due to Chronic Perivesical Inflammation.

In January, 1896, Dr. Ernst Michels read the paper already referred to at a meeting of the Royal Medical and Chirurgical Society On Prevesical Abscess; and lastly:

In the *Annals of Surgery*, February, 1896, is a paper by Dr. L. W. Hotchkiss, of New York, on Chronic Perivesical Inflammation. Each and all of these papers are well worthy of study.

THE tenth congress of the French Association of Surgery will be opened in Paris, at the Faculty of Medicine, on Monday, October 19th, under the presidency of Professor Terrier. The opening session will be at 2 o'clock. Two questions are especially suggested for discussion at the congress: (1) The Surgical Treatment of Club Foot, to be opened by M. Forgue, of Montpellier; (2) Treatment of Prolapse of the Genital Organs, to be opened by M. Bouilly. Communications should be addressed to M. Lucien Picqué, General Secretary, 8, Rue de l'Isly, Paris.