CLINICAL REMARKS ON TWO CASES OF TUMOUR OF THE BLADDER.

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GENTLEMEN,—There have been recently in our wards some excellent examples of those rare affections, tumours of the bladder. I propose to-day to select for remark two of these cases, partly for their rarity, partly because we have the morbid growths themselves for your inspection.

In speaking of tumours, I mean true morbid growths; and exclude those swellings of the hypertrophied prostate met with in certain old men, which, by their deformity, produce a train of sufferings sufficiently acute. During the year just past, we have had several such patients in our wards, affording examples of some or other of the consequences of hypertrophy of the prostate. But with such cases it is not my intention to occupy your time to-day.

The list of morbid growths comprises :

1. *Fibrous polypi*, fibrous outgrowths from the surface of the bladder, an extremely rare affection, described by Civiale and one or two others. Of these growths, a few specimens are preserved in museums.
2. *Scirrhus and encephaloid* of the walls of the bladder, growths nearly always secondary to cancerous disease elsewhere, but occasionally occurring primarily in this situation.
3. *True epithelial cancer*, beginning in and slowly extending in the wall of the bladder.
4. *Villous tumour*.
These growths may all begin in the bladder itself; but affections of the organs may lead to projections into, and invasion of, the bladder—as, for example—
5. *Malignant disease of the prostate*, generally encephaloid in character.
6. *Tubercular disease* of the vesiculæ seminales, or of the vesiculæ seminales and prostate.

At this moment, there is an old man in Ward 10, seventy years of age, and in fair general health, who has, for the last eighteen months, been unable to void any urine by natural efforts. He draws it off through the catheter, by which the urethra is easily traversed until the prostate is reached, where, if not well curved or very supple, it stops short. There is no suprapubic dulness; but, when the prostate and floor of the bladder are examined *per rectum*, an irregular mass of stony hardness is felt; one firm nodule projects at the upper margin of the sphincter ani into the rectum. This condition of the base of the bladder not only obstructs the flow of urine, but is also the cause of the tenesmus to which he is frequently subject, though the rectum itself is at present free from the growth. The urine is normal, always clear, and free from blood or pus; but the increasing irritability of the bladder is the patient's constant torment. By night or day, he seldom passes an hour without being compelled to use his catheter; for, as soon as two or three ounces of urine collect, his bladder makes violent efforts to expel it. The wide extent of the induration of the prostate and floor of the bladder, and its irregular stony hardness, are the grounds on which we consider it to be a case, not of simple hypertrophied prostate, but of malignant, probably scirrhus, disease.

There is also at the present time, in Ward 9, a young man, whose life is tormented by cystitis and great irritability of the bladder, sometimes more, sometimes less acute, but of already more than twelve months' standing; and occasioned by a condition of the vesiculæ seminales, which we believe to be tubercular. He has already undergone Syme's amputation at the ankle for strumous disease of that joint. On another occasion, I shall draw your attention to tubercular disease of this region, of which, from time to time, we get examples sent in as cases of stone. I will pass to the two cases of which the bladders are before you.

The first is the case of epithelial primary disease, whose history has been carefully recorded by Mr. A. J. Grant, the ward-clerk. The patient, No. 2,448 in the hospital register, was sixty-three years old; and, until four months before his admission, had no sign of disorder of his urinary organs. The first symptom of his disease that attracted attention was

hæmorrhage. The urine became red, and the blood increased so much that in a week's time it came away from the bladder in clots. Soon, but after the appearance of clots, pain began to be felt; but only after the bladder was emptied. So long as the patient was still, and did not pass urine, he was free from pain. This character of the pains continued until after his admission to hospital; but, in a few days, there were added violent attacks of spasmodic effort to void urine, which, always painful, became excruciating towards the end of his life, growing more and more frequent, and at the end almost constant.

The frequency of micturition, at first not unusual for a man of his time of life—twice by night and about every four hours by day—steadily increased during the three months which elapsed after the first appearance of the blood, until the call to pass urine came every quarter of an hour. Up to this time, the urine, though bloody, was not offensive, and had no sticky deposit. At this stage of his malady, an irregular practitioner sounded the patient for stone. After this exploration of his bladder, which he described as being prolonged and very painful, his sufferings increased; micturition became necessary every quarter of an hour; and the urine, still loaded with blood, grew very offensive. Probably the exploration was the immediate cause of the cystitis, though this affection was almost certain to arrive sooner or later. Still, the danger of thus aggravating the patient's sufferings by instrumentation should always be kept carefully in view, when deliberating on the expediency of sounding a patient. On his admission, on December 7th, 1880, he was found to be a fairly stout man, and in pretty good general condition; of this stoutness he lost little before death; but his state as to micturition was pretty much as already described; frequent (half-hourly) calls to pass urine—its ejection being accomplished with much straining and pain, the latter referred to the end of the penis; and blood and ropy pus passed every time with the urine. The sound introduced into the bladder struck no stone, but caused great pain in passing over the neck; indeed, the exploration could not be completely carried out, owing to the pain it excited. The prostate was not enlarged, nor could any unusual condition of the bladder be detected by rectal examination. There were no enlarged glands to be felt in the inguinal or the iliac regions.

Thereafter, various remedies were employed to allay the cystitis and consequent irritation of the bladder, but without avail. On one occasion, the patient was anaesthetised, the bladder carefully sounded, and its ammoniacal ropy contents washed out by Clover's bottle. As before, no stone was found; but, in the purulent deposit from the fluid so exhausted, shreds of tissue were found on microscopical examination, by Mr. Stanley Boyd, our surgical registrar; these consisted of patches of epithelial and nucleated cells, to some of which a shred of fibres was attached. In spite of anodynes, of attempts by tying in India-rubber catheters, or by washing out with quinine or astringent solutions, or simple warm water, to diminish the accumulation of foetid urine, the patient's sufferings increased; the catheter could not be retained more than four or five hours; then the spasm it excited became unbearable. At this time constitutional disturbance began. His tongue became dry, and coated with brownish fur; and his strength rapidly diminished. In these circumstances, I proposed to him that he should submit to operation—not with any expectation of cure, but, by establishing a free drain for the urine as fast as it reached the bladder, of relieving him of the constant pain and straining excited by its accumulation and putrefaction therein. With this object, on December 29th, I performed the usual lateral operation for the removal of stone from the bladder: making at first a small opening in the neck of the bladder, through which I introduced my finger, and recognised a soft mass projecting from the floor on the right side. By enlarging the incision in the neck of the bladder, I was able to bring away, in a lithotomy forceps, the mass I felt, which proved to be a pedunculated growth of cellular tissue, as large as a marble, but too much disorganised by sloughing for its structure to be minutely examined. By free injections of cold water, several such masses were washed out, along with much stinking pus and mucus. The hæmorrhage during the operation was unimportant. The patient was but little relieved by the operation, though bleeding ceased and the urine drained away continuously through the wound. His spasms, though less frequent, continued with nearly the same severity until his death, on the third day after the operation.

Post mortem, the condition of the urinary organs was very interesting, and, especially so, when compared with that of the case of villous disease, whose examination we made on the same afternoon. The bladder was contracted, of about six ounces' capacity; and, when laid open along the mesial line from the neck by the anterior part to the apex, and everted, it revealed this condition. There is a growth, which, commencing on the inner surface opposite the pubes, continues along the right side to the apex, and there crosses to the left. On the right, the growth is much the thickest; while, on the left, its advancing margin

is well defined, being raised near the apex a quarter of an inch above the general level of the mucous membrane. The surface of the growth is generally sloughy and very irregular; long shreds hang down from the upper portion, and from the right side depends a finger-like process, one inch long and a quarter of an inch across. The mucous membrane of the bladder elsewhere is grey and pigmented, thus showing considerable chronic inflammation. The walls are rugose, from moderate hypertrophy of the muscular tissue. Here are some sections of the growth, showing the nests of nucleated epithelial cells, occupying the meshes of a fine connective network, freely supplied with capillaries. You should compare it with the specimen from the villous growth, showing the delicate branching processes hanging freely from the tumour. The ureters are but little, if at all, dilated—though, like the bladder, the mucous membrane and that of the pelvis, especially of the pelvis in the left kidney, are thickened, greyish, and marked with small hæmorrhages. The kidneys themselves are congested and interstitially inflamed, the left particularly so. These changes in the kidney are of recent origin, set up by extension of the irritation from the bladder.

You will note, that the condition of the body after death confirmed the indications of the symptoms during life, that the patient died of exhaustion consequent on the irritation of the bladder, and from the cachexia of the tumour. The general system was but to a small extent invaded. A few of the lumbar lymphatic glands were enlarged, and pale grey on section; but no consecutive multiplication of the growth beyond the bladder was found.

Next come the notes of the case of villous growth. J. M., 38 years old (No. 2,615 in hospital register), a lamplighter, and, therefore, walking much daily, had been a healthy man, and noticed nothing unusual in his habit of passing urine until April 1880, eight months before admission. Then suddenly his urine became red with blood after exercise, and flowed less freely than before. This red coloration was for some time only observed during and after exercise, never on rising from bed in the morning. The intermixture of blood continued, without intermission, to be the main trouble until last Christmas, with the exception only of three or four days, during which his urine was of ordinary aspect. About Christmas new symptoms appeared—namely, constant desire to micturate and uncontrollable dribbling. On Christmas Day, clots of blood came away during the efforts to pass urine; at the same time pain commenced to be felt in passing urine, and for three or four minutes afterwards, at the end of the penis. When admitted on December 30th, he walked to the hospital from Kentish Town, and the urine passed on his arrival was dull crimson. The next day the patient was passing urine and blood every few minutes, with much painful straining to void the last few drops; often black clots, without any urine, were then ejected. There were no renal or suprapubic tendencies; no swelling of the testes or cords. The prostate was of normal size, but the trigone of the bladder, felt through the rectum, appeared to be thickened though yielding. The finger experienced the kind of resistance afforded by a moderately distended bladder. To clear up this doubt, a flexible *coudé* catheter was passed into the bladder, encountering no difficulty, and giving rise to no pain in its passage; but as only a few drops of blood escaped through it, some water was injected; this returned almost untinted with blood, being forcibly driven out both through and along the sides of the catheter. The bladder being thus proved to be empty, the catheter was withdrawn, and brought away in its eye a grey granulation. This was at once put under the microscope, when it was seen to be a compound papilla, covered by slender columnar epithelium. This discovery materially aided the diagnosis, otherwise difficult, of vascular tumour of the bladder. This diagnosis, suggested by the persistent painless hæmorrhage, and by the fact that villous is the most frequent form of tumour of the bladder, was rendered certain by the structure of the papilla. This examination took place the day after the patient's admission—viz., December 31st. The treatment ordered was turpentine, in five-minim doses, every four hours, opiates to relieve spasm, rest in bed, and ice to the perinæum. It was also determined that, if this did not check the hæmorrhage in twenty-four hours, recourse should be had to subcutaneous injections of sclerotic acid, a form of the active principle of ergot. As the bleeding had not diminished by 11 A.M., on January 1st, a subcutaneous injection was given, not of sclerotic acid, but of ergotine itself, specially prepared on a new method by Mr. Gerrard, the hospital pharmacist. The injection was repeated at 5 P.M., and again at 11 A.M. on the next morning (January 2nd). On each occasion half a grain was injected, about half the dose usually employed. By 11 A.M. the hæmorrhage had greatly diminished, though not wholly ceased, when suddenly syncope set in, and he died. *Post mortem* examination twenty-seven hours after death. The body was somewhat blanched, and the viscera were all more or less drained of blood. The heart contained a small quantity of fluid blood, free from clot, and

was firmly contracted in rigor mortis. The pulmonary arteries were clear of coagula. Owing to the obscurity surrounding the cause of death, all the viscera were carefully examined, and were all found to be free from disease, with the exception of the urinary organs. These, from the great size of the growth, formed an admirable example of a villous tumour in the bladder; such tumours usually are not larger than a marble or small strawberry; but this, you see, is as large as a hen's egg, measuring over two inches in length, by one and a-half inches in breadth. The growth itself is formed of long delicate villi of deep red colour, and attached by a short pedicle, measuring less than half an inch across, to the margin of the orifice of the right ureter, around which it so grows, that a probe passed down the ureter reaches the bladder only after traversing the growth. These growths are scarcely ever, if ever, found away from the trigone, and usually spring from one of the three orifices. In structure they are true papillomata, almost warts; and they prove fatal, not by any malignant character of their growth, but mainly by their mechanical action, wearing the patient out with pain and irritation, and partly by exhaustive loss of blood, for the structure of the tumour is loose and highly vascular, each of these delicate papillæ being provided with its capillary vessel, so that the frequent rupture of blood-vessels is an unfailing occurrence. We owe to our surgical registrar—Mr. Stanley Boyd—the preparation of the specimens for our inspection, and also these beautiful sections of the growths under the microscope now before you. You will at once recognise the fine branching papillæ, each one containing its capillary, and covered by slender columnar epithelium, of which the mass is almost entirely composed.

The bladder, ureters, and kidneys, are excellent examples of the changes which take place as simple results of impediment to escape of urine from the bladder. The bladder itself is of ordinary capacity, its mucous membrane is healthy, not chronically inflamed as in the example of epithelial cancer. It is rugose and slightly sacculated from the great hypertrophy of the muscular coats, being half an inch thick in some places. The ureters are vastly dilated on both sides; that from the right kidney almost admitting the little finger, and having its coats much thickened; but, like the enormously dilated pelvis and calyces, presenting no trace of inflammation either recent or old. The kidney itself shows an extreme result of distention, being little more than a bag of fluid. All signs of papillæ or pyramids are gone; their sites at the heads of the calyces being occupied by depressions. The cortex forms a thin layer, nowhere more than a quarter of an inch thick, and with the expanded pelvis and calyces constructs the bag which the kidney has become. The left kidney in all respects resembles the right, except that the dilatation of its several parts is considerably less. The cortex is of ordinary thickness, pale yellow, and of normal consistence; and a good deal of the pyramids still remains. It is obvious how these changes come about. The growth began at the outlet of the right ureter; consequently impediment to the escape of urine from the right kidney commenced very early, and was kept up, long before any difficulty occurred to the entry into the bladder of urine from the left ureter; thus expansion of the left ureter and kidney began only when the tumour had gained such a bulk, that would enable it to overlie the orifice of the left ureter, when it fell on the floor of the bladder, or was compressed against the trigone in the empty state of the viscus. So again, the hypertrophy of the muscular coat of the bladder was caused by the impediment to the discharge of urine when the tumour blocked the neck. This position of the tumour against the neck of the bladder probably excited the violent spasmodic contractions which were so painful during the last days of the patient's life.

It is interesting to compare the absence of inflammation in this bladder with the abundant evidence of cystitis, pyelitis, and nephritis in the case of epithelioma. There we have the slaty grey colour, and punctiform hæmorrhages in the mucous membranes, the shiny muco-pus adhering to the walls of the bladder, ureter, and pelvis, and the nephritis most decided in the left kidney, and not quite absent in the right one. You will recollect in the patient's account of his state previous to his admission here, that his urine, though bloody, was neither ropy nor offensive before the sounding by the quack; in fact, probably it was very similar to that which our patient with villous tumour passed; dark red, though fairly clear, and with a sediment consisting almost wholly of blood-clots. After the sounding, the urine quickly changed, and showed evidence of cystitis. Cystitis being set up, it was not difficult, in a bladder deformed by thickening of its coats, for a shred of putrid muco-pus to slip into, or be driven into the orifice of an ureter during some expulsive effort of the bladder, and there excite inflammation, which would quickly travel along the irritated mucous surface to the pelvis of the kidney. This is one mode, though probably not the only one by which pyelitis is set up in cystitis; but it is a mode that explains why, in cases of cystitis and pyelitis set up

by upwardly extending irritations, one ureter and kidney shall be affected while the other escapes.

In both these patients, the sign that enabled us to make a correct diagnosis during life, was the evidence obtained by putting under the microscope fragments of the tumour itself; these fragments coming away in the fluid withdrawn from the bladder in the one case, and being brought out in the eye of the catheter in the other. But such good fortune is rare, and probably portions of the growth are separated only when it has attained considerable development. Hence in many cases the diagnosis (on which depends the treatment) has to be made on symptoms. Now the three leading symptoms of tumour are—1. Irritable bladder; 2. Hæmorrhage; 3. Pain of a particular kind. But these symptoms also often accompany several other affections—namely, stricture of the urethra, stone, chronic retention from enlarged prostate, malignant and tubercular disease of the prostate and vesiculae seminales, and certain diseases of the kidney; even piles or ulcer of the rectum are occasional reflex causes of irritable bladder. The presence or absence of such possible causes as these must be ascertained by physical examination of the parts. In these two cases, the exclusion of all causes of vesical irritative hæmorrhage and pain, but stone, was easy during life. The condition of the urethra, and of the prostate and rectum, could be ascertained; while the clinical symptoms, though not strongly indicative of stone, did not certainly contradict that disorder.

Irritability of the Bladder.—In cases of stone, stricture, and prostatic retention, it usually happens that too frequent and somewhat painful desire to pass urine is the first symptom for which relief is sought. When stone excites it, irritability is an early sign, because the cause of irritation, the stone, most frequently lies on the neck, being continually thrown thither by the action of the vesical muscles. Cases of tumour commonly differ from the rest, in that bleeding is the first symptom to attract the attention. Irritability of the bladder is a late symptom. It did not appear in our two patients for some time (four weeks in one man, and several months in the other) after hæmorrhage had become habitual. The early or late variation in the time of the appearance of frequent calls to pass urine in cases of tumour when bleeding has become a prominent feature of their malady, depends much on the position of the growth: that is, in its proximity to the outlet from the bladder. In our case of epithelioma, the morbid growth began at the right side of the bladder, and, spreading in all directions along the mucous membrane, soon reached the neck. But in the case of villous tumour, the tumour was attached to the right ureter by a pedicle, and could affect the neck only when it had attained bulk sufficient to enable it to fall against that part. In the former, irritation soon came; in the latter, only shortly before death. Nevertheless, the character of the irritation they excited had features strongly unlike the irritability caused by calculus.

Hæmorrhage.—The bleeding had characters differing from that customary with stone; it was the first symptom sufficiently urgent to attract attention; it was from the beginning comparatively copious, and soon consisted in great part of clotted blood. Again, the hæmorrhage was persistent, and was almost throughout the leading symptom. This is very characteristic of tumour, though intervals of cessation of hæmorrhage do occur during the course of a tumour. Even several weeks may at first intervene between the discharges of blood; no other symptom is developed, and the urine may remain in the intervals quite free from blood or albumen. But when once bleeding is set up, it becomes more and more copious, and the intervals between the bleedings grow more and more short, while the irritability is continuous, slight, or altogether absent. When a stone causes hæmorrhage, it is seldom copious at first, and never prolonged; but it very rarely refrains from causing irritability.

Hæmorrhage from calculus is caused by the stone eroding the mucous surface of the bladder where it lies, and opening a vessel whence blood escapes; but such vessels are commonly of small calibre, and are quickly closed by coagulation of the blood. Hence, characteristic of such bleedings, is the small quantity lost, being often sufficient merely to furnish traces of albumen in the urine, or to appear as a few drops of blood *per urethram* distinct from the urine. Copious intermittent hæmorrhage may be caused by stone, but only in cases complicated by hypertrophied prostate, on which some dilated veins are coursing. Such veins often bleed when grazed by a stone, just as they will bleed copiously for a short time, even when there is no foreign body in the bladder, if the organ become congested by exposure to cold, by venereal excitement, etc. But, when the gorged vessels have drained themselves, and their orifices are plugged by coagula, the bleeding ceases until they are again overdistended, or again injured, and their coats give way anew. There is no regular increasing frequency and gravity of the hæmorrhages. It is different with the blood-vessels of a rapidly enlarging tumour. They are very numerous, have but thin walls, and are

ill-supported in the soft cellular tissue, in which the fibrous element is but scanty. In such new structures, the vessels that first give way are plugged, and shrink, while new ones develop rapidly in their place, which are ruptured in a similar manner. Thus, a continual escape of blood from the surface of the tumour is maintained for some considerable time.

Pain.—I have spoken of the *irritable bladder* and of *hæmorrhage* as symptoms of tumour, and how, in their niceties, they vary from the peculiarities of irritability and hæmorrhage set up by stone. The *pain* felt in these cases of vesical tumour closely resembles that due to stone; being felt at the end of the penis, sometimes elsewhere also; but the pain of stone is most acute immediately *after* the bladder is emptied. It is explained by supposing that the bladder's muscular contraction squeezes the stone against the ulcerated patch which it has worn for itself; and that the pain subsides when enough urine has trickled into the bladder to expand its sensitive surface away from the stone. This explanation is probably a true one in many cases, but not in all. The character of the pain in our case of tumour was not exactly of this kind. It was caused by micturition, it is true; but during micturition it was most severe, and culminated in one or two agonising spasms during the ejection of the last drops. It then began to subside, and soon disappeared, until the next act of micturition revived it. Hence the pain was one felt *during*, more than *after*, micturition. In the case of epithelioma, there was ulceration of a great part of the surface of the bladder; in the other patient, there was no ulceration, but there was a foreign body, the villous growth, which was embraced by the extrusor muscles of the neck of the bladder, and prevented their natural contraction. Both conditions accounted for the agonising spasms. These differences in the symptoms were not sufficient to warrant the exclusion of stone as the cause of the patient's sufferings. But they were so far different as to suggest tumour rather than stone. This exclusion of stone was rendered more probable in the case of epithelioma, by failure to detect it with the sound. Sounding is useful to gain information respecting the condition of the bladder, beyond the proof it affords of the absence of stone. The presence even of villous growths sometimes may be felt by the sound, while, when no such growth can be found, the sound forms an useful landmark for the finger in the rectum when searching all that portion of the bladder which can be reached by that means. Sounding should certainly have been performed in the second patient, when the loss of blood had been somewhat checked, and the patient's condition improved by opiates and rest. As it was, instrumentation in both cases obtained positive evidence for us, though in that of villous growth the sound was represented by a soft flexible catheter.

To sum up, then, gentlemen, the remarks which I have made. The symptoms of tumour of the bladder resemble very closely those of stone; this, on reflection, we can see is only what we might expect on *à priori* grounds, for a tumour is—in all that concerns the functional activity of the bladder—as much a foreign body as a stone. The pain in tumour, though like that caused by stone, has its distinctions, which, though not very strong, are useful in diagnosis. It is due in some cases to ulceration; in some, to the efforts at expulsion brought about by grasping of the tumour by the extensor muscles. Hæmorrhage is in tumours an early symptom, and, once established, is the most constantly present; signs of irritation of the bladder are later in their occurrence. With stone, the reverse holds good; bladder-irritation is an early and almost constant symptom, and hæmorrhage, as a rule, is not copious, and is always markedly intermittent: in the cases where stone does produce copious bleeding, this proceeds from an enlarged prostate.

Exercise, perhaps, influences hæmorrhage from stone more than bleeding from tumour; though it has a marked influence over the latter. But exercise is most provocative of pain to the calculous patient; witness the suffering caused by a ride in a jolting cart. On the other hand, exercise seldom causes pain to the patient with tumour. Sudden stoppage occurs with both classes of patients, though more frequently with the calculous ones. Owing to this want of broad distinction between the diseases, it will be proper in every case to sound the bladder, in order to gain all information possible respecting the state of the contents and of the neck and base of the bladder, and the structures in relation with it, by the sound and the finger.

THE BISULPHIDES IN SCARLATINA AND DIPHTHERIA.—Dr. D. H. Sheffield, of Apple River, Illinois, in a recent communication, reports very favourable results from bisulphide of soda in scarlatina and diphtheria. The remedy is given in doses of seven grains and a half, internally, every hour, until an effect on the disease is produced. He alleges that the remedy has a marked effect in cutting short the course of both these diseases. His mortality has been very light, and complications have been unfrequent.