ON A CASE
IN WHICH THE
URINARY BLADDER WAS TWICE RUPTURED;
THE FIRST TIME BY VIOLENCE; THE SECOND TIME (SEVEN
YEARS AFTER THE FIRST) BY THE GIVING WAY OF
THE ADHESION WHEREBY THE RENT
HAD BEEN CLOSED.

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THE following report will, I hope, be deemed worthy of the attention of the Fellows of the Royal Medical and Surgical Society for two reasons; first, because the complete history of the two accidents which befell this man's bladder is fully known, and recorded; and secondly, because it is, I believe, the first time that a description has been published of the post-mortem appearances of the bladder some years after recovery from an intra-peritoneal rupture of its coats.

The view very generally expressed respecting rupture of the urinary bladder is an illustration of the not uncommon process of "begging the question." It is an argument in a vicious circle, and amounts pretty much to

this : "Intra-peritoneal rupture is necessarily fatal, because the escape of urine into the peritoneal cavity always excites fatal peritonitis ; if, therefore, a patient who has suffered an injury which is supposed to have caused an intra-peritoneal rupture of the bladder recovers, the diagnosis must have been erroneous."

This case will, I think, be a satisfactory refutation of such an argument, for we have evidence that the peritonitis which followed the original injury was recovered from ; and there can be no reasonable doubt entertained from the appearances after death, that an intraperitoneal rupture was caused by the injury.

Whether the peritonitis after the original injury was due to extravasation of urine, or to the violence of the injury, I will not here discuss. I will merely remark, in reference to this question, that there are good reasons for the opinion that healthy urine may occupy the peritoneal cavity without exciting peritonitis.

As the case presented itself on the first occasion it was published in the 'Medical Times and Gazette' of 1879 (vol. ii, p. 603, *et seq.*) as one of ruptured bladder ; but in order to give here a concise and connected account of the whole case I will quote a portion of that report.

"On Friday, June 6th, 1879, William H—, æt. 39, a spare man of middle height, was admitted into Brodrip Ward of the Middlesex Hospital under my charge. He stated that he was an upholsterer, and that on Wednesday, June 4th, he was drinking in a public house, when some difference arose between him and another man, which they thought they ought to settle by wrestling. The patient was thrown with much force, and whilst lying with his back on the ground his opponent knelt with both knees upon the lower part of his abdomen. William H— seems to have lost consciousness for a little time, but on 'coming to' he with much difficulty walked home and went to bed, taking over an hour to do the distance, which is about one mile. He tried several times to pass water, and could not ; but within an hour or two after getting into bed he voided a small quantity of blood. He was visited by a doctor twice during the night and the next day, who ordered hot fomentations to the abdomen, and effervescing draughts to check sickness, and recommended his removal to the hospital. The patient stated that prior to the injury

he had not passed water for 'an hour or two,' and that he had been drinking up to the moment of wrestling. He also said that during the thirty-six hours between the accident and his admission into the hospital he had 'certainly not passed more than three quarters of a pint of blood and urine together;' that he had made several efforts before he voided anything at all; that which first passed being like pure blood, but that which was passed at subsequent attempts became less and less blood-charged, and more and more like natural urine. He began to suffer intense pain in the hypogastrium immediately after his belly had been kneaded, but as the hours wore on the pain, though it never left the lower part of the abdomen, 'got higher and higher up his stomach;' and he added that he had vomited frequently, bringing up a quantity of greenish fluid, and had also had a good deal of hiccup.

"On admission his face looked pale, sunken, and anxious; his skin was covered with cold perspiration; his abdomen was tympanitic, distended, and extremely tender, the slightest pressure causing him to wince and cry out; the most acute tenderness seemed to be at a small umbilical hernia and just over the symphysis pubis. Nothing abnormal could be felt *per anum*. He had micturated voluntarily, but with great pain and difficulty. A No. 7 silver catheter was introduced with ease into the bladder, and between three and four ounces of clear, normal-looking urine were withdrawn. After the urine ceased to flow a very slight pressure made with the finger-tips upon the hypogastric wall caused a spasm, whereby four or five small soft black bodies, the size of melon-seeds, were expelled through the catheter; these proved to be blood-clots. The point of the catheter was then moved over the inner surface of the contracted bladder in search of a rent in its walls, but no indication of such was detected. The patient was frequently vomiting a bright green, bilious fluid. Pulse 120, soft and compressible, and fairly full. Respirations shallow, but of normal frequency. Tongue moist. Ordered hot fomentations to the abdomen; half a grain of powdered opium in a pill every six hours if awake; to take no fluid and as little solid food as possible, and to quench his thirst by sucking a small quantity of ice. A gum-elastic catheter, with india-rubber tubing attached, was fixed in the bladder, so that the urine might flow off into a vessel beside the bed.

"June 6.—*Vespe*: Temperature 100°, pulse 108. Patient has ceased vomiting since 6 p.m. Has hiccup badly. Abdomen less tender. Has eaten some bread and butter, and not vomited after it. Took one slice at 3.30 p.m. and another at 11 p.m.

"7th.—Temperature 101.6°, pulse 120. Was sick once in the night, the vomit being bilious. Two pints and a half of clear yellow urine have flowed off through the catheter. Abdomen less tender, but pressure over hypogastric region produced vomiting. Had another pill at 3 a.m.

Vespere: Temperature 101.8° , pulse 116. Vomited after the bread and butter to-day.

"8th.—Temperature 99° , pulse 90. Tongue moist and clean. Abdomen distended and tympanitic, but less tender. No sickness to-day after food. Catheter still in; one pint and a half of urine has been passed. Ordered four ounces of brandy daily.

"9th.—Temperature 101° , pulse 98. Complains of a good deal of pain in hypogastrium. Catheter removed, washed, and re-introduced. The point was covered with what appeared to be pus. Bowels opened twice during the day; motions soft and clay-coloured. No more sickness. *Vespere*: Temperature 100.4° , pulse 100. No further change.

"10th.—Still much, sometimes very acute, pain in hypogastric region; to-day, moreover, there is considerable thickening and hardness above the symphysis pubis as high as half-way to the umbilicus, but extending farther to the right than to the left of the median line. The abdomen is somewhat less distended, and, except in the hypogastrium, less tender. Bowels open once this morning, the stools being less loose than yesterday. Catheter to be removed daily and washed out.

"11th.—Temperature 100° , pulse 104. Complains of griping pains in hypogastrium and in the course of the ascending and descending colon, which last a minute or two and then pass off. Abdomen more swollen and tense.

"13th.—Temperature 99.6° , pulse 72. Complains of more pain to-day in hypogastrium; the tenderness in this region is more considerable than it has been during the last few days, but the induration is somewhat less. There is a free thick white discharge by the side of the catheter, and no urine is flowing through the catheter. On removing the catheter it was found plugged with muco-pus. No. 10 catheter was introduced, and about three ounces of clear urine drawn off. Ordered to continue the pills and hot fomentations. The bladder is to be washed out with warm water containing a few drops of a mixture of eight grains of thymol in two ounces of glycerine.

"14th.—The patient complained of so much increase of pain in the hypogastrium after the injection that it is not to be repeated; it was only used once. He passed this morning a stool consisting only of opaque, gelatinous matter, like the white of egg, which, on boiling with liquor potassæ, became quite clear. Urine contains pus; specific gravity 1015.

"16th.—Bowels open slightly this morning, the action being attended with much pain. Examined *per rectum*: no induration or thickening about the bowel, which is full of soft, yellow, solid fæces. Up to yesterday the urine had been pretty clear, but on re-introducing the catheter this morning a quantity of thick, dirty-looking pus first passed, and then the urine flowed pretty clear. On removing the catheter the end which

had been retained in the bladder was seen to be darkly discoloured. The tenderness and induration in the hypogastrium are less pronounced. Feels very low and hungry. Ordered a simple enema, and a mixture containing chloric ether, spirits of ammonia, and tincture of calumba; still continuing the pills and the hot fomentations. Is to have chicken for dinner to-morrow. The catheter is no longer to be fixed in the bladder, but to be introduced two or three times daily if patient cannot micturate without it. *Vespere*: Temperature 101·6°, pulse 96. Bowels acted freely after the enema. Stools normal. Passed urine voluntarily after a little straining. The urine was thick and opaque, being largely charged with pus, and became very ammoniacal on standing.

"From this time the notes show an almost uninterrupted progress towards recovery. The catheter was not again required. The amount of pus in the urine, which for several days was large, gradually diminished. The induration behind the hypogastric wall gradually cleared away, and the pain, distension, and tenderness of the abdomen ceased.

"On June 26th the urine was acid, and contained neither blood, pus, nor albumen, though there was a slight deposit of mucus. On June 30th he was allowed to get up, and the next day to go into the hospital garden. On July 2nd there was a slight reappearance of pus, but by July 9th the urine was acid, sp. gr. 1015, free of pus and albumen, but contained a slight excess of phosphates.

"Quinine mixture was substituted for the alkaline and hyoscyamus mixture. On July 10th the patient left the hospital quite well, and was not again heard of until his return on August 4th, 1886."

The conclusions then arrived at were that there had been a wound high up in the urinary bladder so that the organ had preserved some of its power of retaining and expelling urine, and that the wound had been closed by inflammatory adhesion.

When readmitted on August 4th, 1886, the man made the remark that he was suffering from "the same trouble as that for which he was treated by Mr. Morris seven years before," and when seen in the out-patient department his account of his present illness, and his symptoms, excited the suspicion of ruptured bladder. The following report was made by Mr. Nash, one of the physicians' resident assistants.

Present attack.—On Monday, August 2nd, patient was at a "beanfeast;" but states that he only drank three or

four glasses of wine and three or four of beer during the day. He passed water three or four times, and returned home quite sober.

3rd.—He got up as usual, feeling quite well. His bowels were open, and he passed urine, the latter act being accompanied by slight pain. He next got pain in his abdomen during the morning, which increased as the day advanced. In the evening he was unable to pass water, and was suffering great pain. His wife applied hot fomentations to his abdomen to relieve pain, but without effect.

4th.—On Wednesday afternoon he came to the hospital complaining that he had passed neither urine, fæces, nor flatus, since the previous morning.

The house surgeon introduced a No. 3 catheter (there was no stricture of the urethra) and withdrew about three ounces of turbid urine, which was highly albuminous, and contained a trace of blood.

He has vomited several times since yesterday (Tuesday) morning and suffered a good deal from hiccup. The vomit in the surgery consisted of the contents of the stomach. He was admitted into a medical ward as a case of suppression of urine.

State on admission.—A spare man, with anxious drawn face, complaining of intense pain in the abdomen, and inability to pass urine. Temp. 99°, pulse 124, small, fairly regular, somewhat wiry in character. Tongue coated with yellowish-white, moist fur.

Abdomen : Walls very tense. Extreme tenderness all over the front, flanks, and back. Seat of greatest pain just above symphysis, of greatest tenderness at umbilicus. At the latter spot there is a small hernia, the opening of which just admitted the tip of the index finger.

4th.—Resonant on light percussion all over.

Thorax : Movements slight, percussion and breath sounds normal.

Heart : Apex beat not localised, sounds normal.

Treatment.—Four dry cups applied to loins followed by hot fomentations to loins, and over the front of the

abdomen. All pain and tenderness in the back then disappeared.

10 p.m.—Dr. Pringle and Mr. Sutton, being in hospital, saw the case and recommended opium gr. j every four hours, and the abdomen to be painted with glycerine and belladonna, and covered with hot fomentations. During the evening patient vomited a large quantity of dark green bilious matter.

5th.—This morning he is much better, but has passed neither urine, fæces, nor flatus since admission.

November 3rd, 5th and 7th.—Catheter passed, and one pint of thick, turbid urine drawn off.

Urine: Acid, 1024, contained a large quantity of pus, mucus, albumen, and a small quantity of blood, and indican in excess. Under the microscope no casts were seen, only pus and a few blood-corpuscles.

12 noon.—Dr. Fowler having seen the patient, ordered the treatment to be continued, and an enema, Ol. ricini, to be given at once.

6 p.m.—Half of the enema was returned, and with it a quantity of hard, scybalous masses came away. Patient now seems very comfortable. Has very little pain in abdomen, which is still tender. Has not vomited all day. Bladder not distended.

6th.—Slept well during the early part of the night. About 7 a.m. passed a little flatus and a large quantity of urine, and suddenly became very sick. At 8 a.m. suddenly became collapsed, surface of body covered with cold sweat, pulse not felt at wrist. Quick, calm, and rational; says he does not feel much pain, but feels very weak and exhausted. Abdomen very distended, tympanitic, liver dulness obliterated.

He never rallied, and died at 11.5 a.m.

A *post-mortem* examination was made by Dr. Fowler on August 6th. His report states: The abdomen was distended and tympanitic, and on opening the peritoneal cavity there was evidence of recent acute peritonitis. The contiguous coils of intestine were united by recently

effused lymph, the peritoneum was everywhere injected, and in the pelvis, where the inflammatory changes were most advanced, there were fifteen ounces of purulent fluid, and a quantity of lymph. The stomach and small intestines were irregularly distended. The rectum and sigmoid flexure contained a quantity of semi-solid faecal matter.

A band one inch long united the fundus of the bladder to the anterior wall of the rectum. The vesical end of the band was hollowed out, and through a rupture in its walls, close to the bladder, a string of mucus was projecting. Slight pressure caused puriform-looking urine to ooze from the bladder, showing that there was at the rupture a direct communication between the bladder and the peritoneal cavity. The kidneys were congested, and the pelvis of each contained some purulent urine, and its lining membrane was inflamed.

The other organs were normal.

The rectum, bladder and penis, were removed *en masse*, and submitted to the examination by a Committee, which met at the Royal College of Surgeons, consisting of Mr. Savory, Mr. Bryant, Dr. Goodhart, and Dr. Fowler.

The following is the report of the Committee :

Report on the case of Rupture of the Bladder.

August 13th, 1886.

The undersigned met to-day at the Royal College of Surgeons, at the request of Mr. Henry Morris, to examine a specimen removed from a man who was under the care of Mr. Morris in June 1879, with what was then diagnosed as a ruptured bladder, and who left the hospital recovered.

The patient was readmitted into the Middlesex Hospital, under the care of Dr. J. K. Fowler, on August 4th, 1886, suffering from acute peritonitis, caused, as was eventually shown, by the giving way of the bladder at the site of the old lesion, and he died on August 6th.

The specimen consisted of the penis and bladder laid

open along the anterior aspect, and the rectum with the surrounding structures. The urethra and prostate were of normal size, and free from disease; the bladder also was of normal size, and with the exception of the condition herein described, quite healthy.

The peritoneum covering the back and fundus of the bladder, and that lining the pelvis, was considerably thickened, apparently the result of old inflammation. The bladder wall, for a wide area around the seat of injury, was also thickened from a similar cause. The peritoneum was coated with a layer of quite recently formed lymph, and an opening into the bladder was visible at the base of a band of adhesion between the bladder and rectum.

About an inch below the fundus of the bladder, and on its posterior aspect, slightly to the right of the mesial line, there was, as seen from within the viscus, a rounded opening of a quarter of an inch diameter. This opening led to a funnel-shaped recess, which was bounded at its wider or vesical end by the thickened and plicated vesical walls, and tapered off within a hollow cord-like adhesion into a mere blind sinus just large enough to admit a probe, which could be passed to within one eighth of an inch of its posterior extremity. This tubular band of adhesion was one and a quarter inches in length, and extended between the bladder and the front wall of the rectum. It was in a part of its length divided into two unequal strands, which were united at their extremities, like some of the *musculi pectinati* of the ventricles of the heart.

The wall of this funnel-shaped recess, beyond the level of the outer surface of the bladder, was membranous, not being thicker than a sheet of stout note paper.

This adhesion had been partially torn through at its vesical attachments during life, thus permitting a free escape of urine into the peritoneal cavity.

The lining of this recess was smooth, and in direct continuity with the mucous coat of the bladder, and was marked by finely injected parallel vessels extending its whole length.

The opening into it from the bladder was finely plicated and had somewhat the appearance of cicatricial tissue, but no microscopical examination was made to determine whether it was cicatricial tissue or attenuated mucous membrane, as to have done so would have injured the specimen.

There were no peritoneal adhesions in the pelvis, other than the one above described, but some old pigmented patches were noticed in the deepest part of the recto-vesical pouch.

The explanation of the foregoing changes, taken with the clinical history of the case, seems to us as follows :

1. This pouch marks the site of an injury to the bladder and surrounding structures received by the patient in June, 1879.

2. That injury was in all probability a rupture of the bladder attended with extravasation of urine into the peritoneal cavity, and into the cellular tissue and structures of the bladder wall.

3. At the site of the injury, the bladder and rectum became united by inflammatory lymph.

4. The contractions of the bladder and bowel, hollowed out this adhesion by their traction upon it; thus leading to the formation of the infundibuliform recess above described, and thereby predisposing to the fatal rupture.

5. The perfectly normal appearance of the rest of the bladder, and the characters of the recess itself, negative the supposition that this was an ordinary congenital diverticulum or acquired sacculus.

6. The specimen, in our opinion, exhibits all the features which might be expected at a remote period after a rupture of the bladder.

(Signed) THOMAS BRYANT.

W. S. SAVORY.

J. KINGSTON FOWLER, M.D.

JAMES F. GOODHART, M.D.

Note.—The Chairman of the evening, Dr. John W. Ogle, having written to ask me the question, I desire to state that there seem to me to be two possible causes of the giving way of the funnel-like cicatrix: one is that, owing to its extreme thinness, it yielded under distension of the bladder; the other, that softening and ulceration occurred from the retention and decomposition of urine in the funnel-like recess, just as a sacculus occasionally yields from the same cause. The account of the fatal illness points to the latter cause as the more probable.

(For report of the discussion on this paper, see 'Proceedings of the Royal Medical and Chirurgical Society,' New Series, vol. ii, p. 203.)