pounds, and these are identical with putrescine and cadaverine. Chemically these bodies are related to the amines of herring brine, and they are very poisonous.

In the case of certain well-known micro-organisms we have been long acquainted with the special poisons which they secrete. The yeast plant yields alcohol, carbonic acid, and other products; the vinegar plant turns alcohol into acetic acid, and in many other examples each organism during its life forms a special product. In less well-known instances we may therefore conclude that the same thing holds good—indeed, the existence of soluble poison capable of inducing the disease has been proved in the case of the diphtheritic bacillus; and it appears that it is these chemical bodies, rather than the micro-organisms, which act as the preventive to further infection in the case of inoculation. What a vista of new research does this open out to the chemist, as well as to the physician! To the former it holds out the prospect of the investigation of a new and most interesting class of bodies; to the latter it points the way to the discovery of the causes of disease, and thus to that of its prevention.

But we are only on the threshold of our knowledge of these things. Neither the chemist nor the physiologist is able to explain the anæsthetic effects of chloroform any more than the remarkable, but well attested, phenomena of hypnotism. And in like manner we are unable to state the conditions under which the phagocytes of the lungs or of the tonsils are able, on the one hand, to seize upon and destroy the invading hosts of pathogenic bacilli, or, on the other, fail to prevent their entrance, and cease to keep the guard upon which the health of the body depends.

And now, gentlemen, I have detained you long enough. If you ask for a moral to my story, it will be this: Uphold the dignity of your profession in every direction, but do not forget to honour that which makes for enlarging the boundaries of science. Do all that in you lies to assist in this development. Remember that whilst it is given to few to place the corner stone on the edifice, the work of giving a helping hand is open to all. If you succeed in making even the smallest addition to our stock of knowledge, believe me, the gratification which you will feel will amply repay the trouble you have taken or sacrifice you have made.

AN ADDRESS

ON

THE SURGICAL TREATMENT OF IMPASSABLE STRICTURE; WHEELHOUSE'S OPERATION; ANTISEPTIC INTERMITTENT IRRIGATION.

Delivered at the Annual Meeting of the Southern Branch.

By JOHN WARD COUSINS, M.D.LOND., F.R.C.S.,

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IMPERMEABLE stricture of the urethra is a rare disorder, which has often taxed the ingenuity and patience of many eminent surgeons, and in days gone by has called forth many heroic and hazardous methods for its relief.

Surrounded as we are in the South of England by a large seafaring population, we have abundant opportunities of treating many varieties of stricture in the wards of the hospital, and sometimes the most severe forms of the disease come under our observation. Occasionally genuine cases of impermeable stricture fall into our hands—cases in which no guide or bougie of any kind can be introduced along the urethra into the bladder, and under this condition operative interference has long been regarded as essentially difficult and tedious.

Some authors have dogmatically asserted that, if urine can be discharged through the canal, it ought to be possible by skill and perseverance for an instrument of some kind to be introduced through the stricture into the bladder. This statement, however, does not correspond with my experience. In some cases I have found the urethra to be absolutely impermeable to instruments, although the urine has been discharged in a tiny and tortuous stream. Fortunately, impassable strictures are comparatively rare in the present day, and we must be always ready to take every precaution to avoid mistake. It is the bounden duty of the surgeon to see that no case is relegated to this unfortunate class

until all treatment has fairly failed, and many earnest efforts have been made to penetrate the contraction.

Treatment of Old-standing Stricture Demands Caution.—All cases of chronic and obstinate stricture must be regarded as dangerous disorders; but with an impassable stricture the patient is ever exposed to the risk of many terrible complications, and with the highway to the bladder practically obliterated. If renal symptoms are present and the nutrition of the body seriously impaired no operation, however slight, can be considered as absolutely free from danger, and the cautious surgeon will make a careful selection of his cases and thus avoid bringing his well-intentioned efforts to a sudden and disastrous issue. The constitutional condition of the patient always demands very special consideration, and the state of the urine must receive careful investigation. It is essential to estimate the average amount of urea contained in the secretion, for in every case the danger of surgical treatment is in direct proportion to the extent of the renal degeneration. The existence of serious inadequacy must, even during an emergency, put a restriction upon our efforts and limit us to the performance of such proceedings as are absolutely necessary for tiding over the difficulty. In the course of my hospital practice I have seen many patients, who had been living for years a loathsome existence from chronic stricture, suddenly fall into a comatose condition and rapidly succumb. Not long ago an old sailor was placed in one of my beds suffering from chronic retention and fetid cystitis, associated with long-standing stricture. He looked very ill and micturition was extremely painful and frequent. It was impossible to wash out the bladder, and, therefore, after introducing a fine guide through the urethra, I performed median cystotomy. Unfortunately the weakened renal system would not bear the shock of this little operation, and in a very few days he suddenly fell into a state of collapse. After death the walls of the bladder were found much thickened, and the ureters and pelves of the kidneys converted into accessory receptacles and distended with fetid secretion. The kidneys were large and soft and in the substance of both organs there were many cysts.

Operations for the Relief of Impassable Stricture.—The old operation of perineal section without a guide is performed by cutting down upon the dilated portion of the urethra above the stricture, and then cautiously dividing the contracted part of the canal. The patient having been placed in the lithotomy position, and a staff passed down to the stricture, an incision is made in the central raphe of the perineum about an inch in front of the anus. The edge of the knife is then turned forwards, and the point thrust towards the apex of the prostate, so as to penetrate the dilated portion of the urethra behind the stricture. The contraction is then divided as far as the point of the staff, and a full-sized instrument is passed into the bladder over the urethral orget. This method of performing external urethrotomy by opening the dilated portion of the urethra above the stricture is seldom practised except in some cases of retention, in which the canal is in a specially favourable state for incision. Under any conditions it is a difficult proceeding, and it is my practice to relieve first of all the retention by simple perineal incision or aspiration above the pubes, and then to reserve the treatment of the stricture for a subsequent effort.

Wheelhouse's Method.—Some years since, the present President of our splendid and world-wide organisation (Mr. Wheelhouse) introduced a new form of perineal section for cases of impassable stricture, and his ingenious operation has now rightly superseded all the old heroic and dangerous dodges of finding a way into the bladder without a guide.¹ The patient having been placed in the lithotomy position, the urethra is opened by a clean incision, about a third of an inch above the stricture, upon a straight staff, which has a very small beak on the opposite side to the groove. The canal is then stretched open with forceps, which are carefully held by assistants, and at the same time the apex of the incision is hooked up by rotating the staff and projecting the blunt little hook into the wound. In this way the incision into the urethra is widely expanded, and the operator looks into it in front of the stricture, and searches for the distal orifice with a fine probe or pointed director. By careful manipulation the true passage is sure to be found. Sometimes the opening is hidden in a tiny fold, or buried in a crop of granulations, but the free movement of the point of the instrument is always a sure guide to the operator that it has entered the stricture and is going on in the right direction. The contracted part of the canal must now be care-

¹ JOURNAL, June 24th, 1876.

fully divided on its under surface, and Teale's probe gorget introduced along the groove of the director. The procedure is completed by passing a catheter of full size through the meatus and wound, and then over the dilator into the bladder.

In the performance of this operation there are three points which require special attention:—1. A clean incision must be made into the urethra, and the tissues around the canal ought to be disturbed as little as possible. 2. The point of the probe must always be manipulated with patience and gentleness. 3. The search for the orifice should be conducted in a good light with the canal fully on the stretch. In the winter time an electric lamp will be found of great assistance. I have now adopted this operation in several cases with very satisfactory results, and I regard it as by far the best and surest method yet introduced for reaching the bladder without a guide. By way of illustration I shall now read to you short notes of two of my cases:—

CASE I. Traumatic Stricture of Many Years' Duration: Loss of Left Testicle and Partial Loss of Penis by Machine Accidents: Extravasation of Urine: Wheelhouse's Operation: Recovery.—J. M., aged 45, shipwright, was admitted into Royal Portsmouth Hospital during September, 1888, in a dangerous condition from extravasation of urine. The genital organs and perineum were greatly distended and discoloured. The tongue was dry and pulse extremely rapid and feeble. A deep incision was at once made in the middle line, from the root of the penis to about half an inch above the anus, together with a large number of superficial openings. As soon as the hæmorrhage had ceased the parts were carefully cleansed and then covered, except the central incision, with hot boracic fomentation. The urine escaped freely through the wound and intermittent irrigation was regularly carried out, under the direction of the house surgeon (Dr. J. O'Connor).

After a few days' treatment he had sufficiently recovered to make the following statement: Eighteen years ago half the penis had been torn off by a machine accident in China; and twelve years since another serious accident happened to him in the Royal Naval yard, Portsmouth, when the left testicle was torn out and the perineum severely injured. He had never laboured under gonorrhœa, syphilis, or severe fever, but he had suffered from stricture more or less for eighteen years. He had been through a great deal of treatment, but since the last accident no instrument had been passed into the bladder, and for several years it had taken him some hours every day to discharge his urine, which sometimes escaped in drops and at other times in a tiny twisted stream.

At the end of six weeks the constitutional condition of the patient had much improved, and an effort was made to find the urethra in the midst of the distorted and congested structures, but unfortunately it was not successful. A second attempt was made a month later on, and after a long search the distal orifice was found and a fine lachrymal probe was carefully introduced into the tortuous remnant of the passage, and step by step the stricture was divided. The operation was then completed by aid of the director and urethral gorget, and a No. 12 catheter was passed through the whole length of the urethra. At the end of two months the patient was discharged with the wound healed, after having been taught to introduce a metallic instrument for himself. In May of the present year he called at the hospital to report himself. He had returned to work in the dockyard some months since, and had gained a stone in weight. He was in good health, and he continued to pass a No. 11 catheter twice a week.

CASE II. Impassable Stricture of the Urethra: Urine discharged wholly through Perineal Fistula for Two Years: Wheelhouse's Operation: Recovery.—H. P., aged 39 years, a carpenter, stated that he had been in the army fifteen years, and had led a very dissipated life. He had served at the Cape, and also at St. Helena. He had never suffered from any severe attacks of fever, but he had contracted sores and gonorrhœa several times abroad. On one occasion he had an attack of sunstroke. During the last twenty-one years he had experienced difficulty in passing urine, and had been treated several times for stricture in different hospitals, and had undergone several operations. He had had many attacks of retention, and about five years ago several abscesses burst in the perineum. He was discharged from the army as incurable. The patient was admitted into the Royal Portsmouth Hospital in January, 1890. He was suffering from pain and chronic retention. On examination the perineum appeared very hard and thickened. There were two fistulous openings; one was situated in the middle line, two inches in front of the anus, and

the other in the under part of the scrotum. The urine was repeatedly examined. It was thick and offensive, and contained a moderate quantity of albumen. Several efforts were made under chloroform to introduce an instrument into the bladder, but without success. No kind of instrument could be coaxied along the passage beyond the base of the penis.

After some weeks' rest and daily bath treatment, he willingly consented to an operation. The distal orifice of the stricture was sought for, and after some difficulty was found. The stricture was then carefully slit up on a fine probe, and a large silver instrument passed into the bladder. The whole perineum was much infiltrated, and riddled everywhere with fistulous passages. A few hours after the operation he became unmanageable, and profuse secondary hæmorrhage occurred. He was again placed under ether, and several deep vessels were secured. The metallic catheter was also exchanged for a flexible perineal tube. The after-treatment consisted in daily irrigations and the application of carbolic oil and iodoform. A large metallic instrument was introduced through the whole length of the passage every two or three days. No elevation of temperature occurred throughout the treatment, and the character of the urine rapidly improved. He was taught to pass a No. 12 catheter, and he soon discharged his urine in a good stream. He left the hospital with a sound perineum and the large wound completely healed at the end of two months.

Treatment After Operation.—Cleanliness is the great aim of all local treatment in disorders of the urethra and perineum. The old-fashioned method of dressing wounds after operations by hot poultices and moist applications has long been exploded, and the after-treatment of the present day really consists in carrying out the best method for maintaining perfect cleanliness with the least discomfort to the patient and a minimum of risk from septic disturbance. The treatment I have found extremely serviceable in this class of surgical cases consists in a very simple method of applying intermittent irrigation by a gentle current of warm water. The kind of bath I use is represented in the engraving.² It consists

of a metal pan with a deep well at the bottom, and it is supported on short legs. The patient sits on the side of this well so that the perineum and genital organs can be completely bathed. It is fitted with pipes for irrigation, and these can be connected with a hot and cold water service by ordinary elastic tubing. Another pipe is fixed to the back of the bath for carrying off the waste water, and this can be connected with any convenient outlet. The temperature of the water and the rapidity of the current are regulated by taps, which are attached to the sides of the bath. Patients derive much comfort from the irrigation, and they are anxious to have it repeated. It promotes the escape of purulent secretion, washes out the deep parts of the wound, and effectually deodorises the whole surface. The bath may be used two or three times a day according to the condition of the patient and the state of the wound. In the interval the patient must rest in bed, protected by a cradle, and the perineum should be freely dusted with iodoform. If the surrounding skin becomes inflamed and irritable a mixture of lanoline and oil will be found to be a very soothing application. The urethra should be daily deodorised with a weak antiseptic lotion. A very important part of the after-treatment is the regular introduction of the catheter. Before the operation warm oil should be freely injected into the canal. The instrument must be made to glide through the passage without a hitch by carefully

² The bath is made by Messrs. Heal and Son, bathmakers, Southsea.

keeping the point on the upper wall of the urethra. The introduction of the catheter should be commenced on the third day after the operation, and it must be regularly repeated until the wound is soundly healed.

Bladder Drainage through the Perineum.—In the cases I have related to-day, the evacuation of the urine was carried on after the operation through the perineal wound, and not in the ordinary way by fastening a catheter into the bladder. The instrument is not so comfortable to the patient as the india-rubber tube, and it sometimes causes pain and irritates the wound. Perineal drainage offers the advantage also of diverting the stream of urine, and permitting the anterior part of the passage to be efficiently deodorised and kept at rest—a very important expedient for preventing the development of that form of urethral pyrexia which is intimately associated with the contact of urine with a wounded surface. Moreover, in cases of external urethrotomy for the relief of obstinate and unyielding strictures, the structures of the perineum are already infiltrated and unhealthy, the bladder is the seat of chronic cystitis, and the urine is persistently in a state of decomposition, so that under these conditions there must be a special risk of septic intoxication. Mr. Reginald Harrison has practised this method of drainage with great success after internal urethrotomy, and his patients have been remarkably free from urethral fever.³ Bladder drainage through the perineum is extremely valuable in many other operations. I have practised median cystotomy in the treatment of urethral fistulae, in plastic operations on the penis, and in cases of subcutaneous urethrotomy for strictures in the bulbous and penile portions of the canal. The incision may be regarded as a kind of safety valve in all cutting urethral operations. With reference to the danger of forming a chronic fistula from imperfect closure of the wound, it has never occurred in my practice. When no longer required, the orifice has always been very readily obliterated.

Recurrence of Stricture after Operation.—The tendency to immediate contraction after urethrotomy is always prevented by the judicious use of dilators. But what about the subsequent contraction when the patient has gone from the observation of the surgeon? It has often been affirmed that recurrence of the stricture is more likely to follow external division than any other form of surgical treatment. We must not forget, however, that much of the liability to contraction is due to the character and severity of the disease. The worst and most obstinate forms are certainly produced by accidental rupture and laceration, and recurrence in these cases appears to bear a direct relation to the amount of cicatricial tissue developed in the process of repair. There is, indeed, no form of treatment which can remove the risk of recontraction of the canal. I am willing to admit that strictures do recur after external urethrotomy; but the same tendency would be exhibited after any other possible mode of operation. Fortunately this shrinking can always be arrested by the regular introduction of an instrument into the bladder, and the patient must be instructed to assiduously continue this treatment for many years. He must be told, too, that this important matter is not wholly dependent upon mechanical dilatation, for much will rest with his own conduct and self-management. He ought to live regularly and temperately every day of his life, and in this way he can persistently labour to prevent a recurrence of his old disorder.

Perseverance and Impermeability.—We must not be hasty in concluding that a stricture is really impassable. How often very obstinate contractions are overcome with the help of an anæsthetic and general treatment! Depend upon it, the vast majority of strictures can be successfully managed by intermittent dilatation. Many obstinate cases give way when every source of irritation is removed, and strictures of great difficulty and narrowness are at length made to yield by perseverance and the skilful use of delicate instruments. The dextrous handling of a fine bougie will accomplish much, but rough and injudicious catheterism is full of danger, and will surely aggravate the trouble.

In the practice of urethral surgery we shall often find scope for the exercise of judgment in the selection of the best method of procedure, and opportunity also for patience and skill in our efforts to penetrate tight and tortuous strictures. Occasionally the severest form of the disease may fall into our hands, and then we may confidently have recourse to a precise and ingenious operation, instead of groping in the dark, and puddling in the perineum without a guide.

CASE OF PORRO-CÆSAREAN OPERATION.¹

By W. CADGE, F.R.C.S.,

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I SUBMIT the following case for two reasons: 1, because it possesses intrinsic points of interest; and 2, because there is still much difference of opinion as to the proper course to be adopted in certain cases of obstructed labour and it is well to bring out every case bearing on the subject.

Whether Cæsarean section should wholly or in great part supplant the induction of premature labour or craniotomy; abdominal section having been done and the child extracted, should the uterus be amputated or should it be left *in situ* and stitched up; and if left in the abdomen, should the woman be sterilised by the removal of the ovaries or by ligaturing the tubes, or should she be allowed to incur the risk of repeated pregnancies? These are some of the unsettled questions which I do not intend fully to discuss, all-important as they are, seeing that they have frequently been brought before the profession during the last few years in all countries, and it seems now only to require experience, honestly recorded, to decide them.

Let me then, as briefly as I can, report a case of Porro-Cæsarean operation, the only one, so far as I know, that has occurred in the Eastern Counties. I will begin at the beginning, or, rather, adopting the Spanish method of reckoning the age of a person nine months before birth, soon after the beginning, and say that while *in utero* this patient had hydrocephalus. Her birth was hard to accomplish. Mr. Gillett, of Brooke, who acted on her behalf, has told me that he applied the forceps but could not effect delivery until he had punctured the fontanelle and evacuated a very large quantity of hydrocephalic fluid. Strange to say she lived and grew up, that is, to the very limited extent of 46½ inches. With this dwarfish stature she had to a slight extent rachitic limbs, and, as a legacy from her prehistoric hydrocephalus, a large head. Her head measured 24 inches in circumference, fully one inch more than the head of any member of our medical staff.

At the age of 27 she again fell into trouble, and became pregnant—"sat down to dinner before grace was said," as Fielding expresses it. She was admitted into the hospital in March of this year, a few weeks before her expected confinement, and I found that the antero-posterior pelvic diameter was not more than an inch and a half. We consulted, and decided that abdominal section and amputation of the uterus should be done shortly before labour commenced. Accordingly, on March 25th, an incision through the abdominal wall of 4 to 5 inches was made below the umbilicus; two flat sponges were then inserted to prevent blood or liquor amnii getting into the peritoneal cavity; a small opening was made through the thin uterine wall, and extended vertically by two fingers. The liquor amnii escaped, and the foetus was easily extracted by the head, and the funis tied. The uterus contracted, threw off the placenta, and was easily drawn out through the abdominal wound. Another sponge was put in its place, and the wire of the *serre-nœud* was quickly placed round the cervix, fastened and tightened sufficiently to arrest bleeding, but not tight enough to cut the uterine tissue. A stout needle was then passed through the cervix close to the encircling wire to prevent its slipping; the uterus, with its appendages, was clipped off with scissors, and the stump trimmed up a little and covered with perchloride of iron. The external wound was carefully closed round the stump of the cervix, exactly as in the old days of clamp and ovariectomy.

The child looked blue (the patient inhaled ether), but it cried lustily, and seemed to recover. It continued blue, however, and did not breathe well, and, notwithstanding the use of warmth and restoratives, it faded off and died four hours after its birth.

The patient went on well for a few days, then symptoms indicative of pleurisy ensued, pulse and temperature rose, pains in various parts of the chest, friction sounds on both sides, settling eventually into clear signs of fluid in the lower left chest, with displacement of the heart to the right.

So far as the abdominal region was concerned, all went well; the wound healed, the clamp came or was clipped away on the tenth day; the deep depression at the lower end of the wound, caused by retraction of the uterine stump, gradually filled up and

¹ Read before the annual meeting of the East Anglian and Huntingdon and Cambridge Branches of the British Medical Association and the Norwich Medico-Chirurgical Society.