In March, 1926, he was seen again by Dr. Davies, when there was a distinct recurrence of the optic neuritis, but no iritis; he had practically recovered by July, 1926, and in the meantime had had a tonsil enucleated. In November, 1927, he had another recrudescence of his optic neuritis. On no occasion has there been any scotoma, either relative or absolute; the fields were quite symmetrically contracted, and there was no enlargement of the blind spot.

On January 2nd, 1928, three weeks after the sinus operation, Dr. Leighton Davies reported:

"The vision has improved, and this improvement is associated with a very definite lessening of the optic neuritis, which may be said to have practically subsided, though, of course, the appearance of the discs is not quite normal. He has never made quite such rapid improvement."

On April 30th, 1928, three months after the nasal sinus operation, Dr. Leighton Davies reported:

"All the evidence of any congestion of the blood vessels of the retina has disappeared."

Time alone can show whether the remarkable improvement following operation will be permanent. The main purpose of this communication is to describe the diagnostic technique for infection of irregularly developed sphenoidal and posterior ethmoidal sinuses, which has proved immensely helpful in several cases coming under my notice. I believe that it would have been impossible to detect the highly virulent focus of streptococcal infection in this case except by the diagnostic method described. At any rate it is felt that such exploratory methods have the advantage of giving exact information as to the presence and location of an infection, or of its non-existence, in which case any useless operation could thereby be avoided.

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PROSTATIC OBSTRUCTION.

A SUGGESTED PROCEDURE FOR MORE ACCURATE DIAGNOSIS
AND FOR THE TREATMENT OF SELECTED CASES.

BY

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The procedure described in this paper is suggested for the treatment of various types of prostatic obstruction, for which the methods of treatment at present employed are not entirely satisfactory. It is devised particularly for dealing with small and moderate enlargements of the fibroid type and with local adenomatous projections on the vesical orifice. In most of the prostates of this type the pathological capsule is so ill developed, or is so adherent, that clean enucleation is impossible. It is these cases that give so much trouble during operation and are followed by the least satisfactory results.

The technique here described serves two purposes: (1) the more accurate diagnosis of the type of prostate that is causing obstruction to the urinary outflow; (2) the destruction by electro-coagulation, under visual control, of the offending portion of the prostate. It entails the use of two instruments, which may respectively be termed the diathermy catheter and the suprapubic cystoscope. The catheter is passed per urethram, the bladder is then distended with water and the cystoscope passed into it by suprapubic puncture (Fig. 1).

Description of Instruments.

The diathermy catheter is exactly similar in shape to the ordinary gum-elastic coude catheter (Figs. 2 and 3). It is 12 inches long and 22 Charrière in circumference. It consists of a metal tube insulated with special boilable lacquer. It is provided with two lateral eyes on the bend, and terminates in a detachable silver electrode. Various

shaped and sized electrodes can be fixed as desired. The proximal end terminates in a cylindrical chamber and connecting plug attached thereto at right angles. The chamber is provided with a stopcock, which controls the flow of the fluid. The catheter is connected to the diathermy machine by means of a rubber-covered cable with push-in connector.

The suprapubic cystoscope consists of a valved cannula (Fig. 4) fitted with compression ring and rubber washer, trocar and cannula (Fig. 5), and telescope (Fig. 6). The size of the cannula is 21 Charrière in circumference and 4½ inches long. It is provided with a sliding guard, which can be fixed in any position. The optical system, owing

to its comparative shortness (6½ inches in length) and large diameter, gives a very brilliant image. It is, in addition, provided with wide angle objectives. The lamp is enclosed in the alignment of the telescopic sheath in order to ensure smooth passage through the cannula. It is connected to the battery by means of the usual switch, which is sprung into a groove behind the eye-shield. Leakage at the proximal end of the cannula can be controlled by means of the compression washer in the cannula.

Anaesthesia.

The procedure can be carried out under urethral or sacral anaesthesia, combined with local infiltration at the site of the suprapubic puncture,

but in the main I have used general anaesthesia.

Technique.

The patient is placed on the table in a moderate Trendelenburg position. The indifferent electrode of the diathermy machine is applied to his thigh, preferably the right, as the operator stands on his left side. The diathermy catheter is introduced and the bladder filled with sterile water from a funnel. It is filled to such an extent as to ensure that the peritoneal reflection is raised away from the pubis so as to allow of the introduction of the cystoscope into the bladder. A small incision, a quarter of an inch long, is made through skin only, in the middle line, 1 inch above the pubic symphysis. The trocar, carrying

FIG. 1.—The cystoscope should have been shown as entering the bladder nearer the pubic symphysis and in a vertical direction.

the two sheaths of the cystoscope, is thrust into the bladder in the same way as though for suprapubic aspiration. Immediately this is done the funnel is lowered and a few ounces of water are allowed to run out of the bladder. The object of this is to diminish the tension on the bladder wall, and so prevent the tendency for fluid to escape

FIG. 2.

through the aperture, outside the sheath, into the space of Retzius; at the same time too much fluid must not be run out or the bladder wall will tend to retract off the sheath, thus leaving its distal end in the aforementioned space and not in the bladder. The trocar and inner sheath are now withdrawn, leaving the outer sheath in the

FIG. 3.—Fig. 2 enlarged to nearly two-thirds natural size. A, Lateral eyes. B, Detachable silver electrode. C, Connecting plug for diathermy machine. D, Stopcock. E, Orifice for filling bladder.

bladder. Water is prevented from escaping by the valve in the outer sheath. The proximal end of the withdrawn inner sheath is fitted with about 1 foot of rubber tubing and reintroduced through the outer sheath. Water from the bladder can thus be conveyed into a suitable receptacle. The funnel is now raised and water poured into it *ad lib.*

FIG. 4.—Valved cannula.

In this way a free current passes through the bladder and irrigates it in a most effective manner. As soon as the fluid escaping from the bladder is perfectly clear, the inner sheath is withdrawn and replaced by the telescope, which is passed with its fenestra towards the pubis. A pint or so of water is left in the bladder so as to allow a sufficient

FIG. 5.—Trocar and cannula.

FIG. 6.—Telescope.

volume of clear medium in which the end of the cystoscope can be moved. The tap of the catheter is turned off and the filling tube and funnel detached; the switch is attached to the cystoscope and the light turned on. The catheter is manipulated with the left hand and the cystoscope with the right. By moving the telescope up and down in its sheath, and by adjusting the proximal end of the whole instrument in the medial plane of the patient, the vesical orifice and the tip of the catheter projecting through it can easily be located. The appropriate degree of distension of the bladder must be maintained, for in this way only can the prism of the telescope be kept at some

distance from the base of the bladder. By adjusting this distance there is no difficulty in visualizing clearly the whole vesical aspect of the prostate. This is obviously a great advantage over the view obtained through a per-urethral cystoscope, where only a segment of the orifice can be seen at a time, and that at very close quarters with its consequent magnification and distortion.

Examination of the Vesical Orifice and Vesical Aspect of the Prostate.

The condition of the orifice, whether it is stenosed or deformed, and the precise macroscopic detail of the prostate, whether it is locally or generally enlarged, can be demonstrated. By adjusting the catheter so that its point just shows inside the bladder, and then moving it, it is possible to gauge the mobility or fixity of the vesicle orifice. In the same way a fairly good idea can be formed as to the softness or hardness of the prostate. By using the tip of the catheter as a seeker, the prostatic urethra immediately below the orifice can be explored. Median bar formation, if present, can be demonstrated, together with the extent of its development and the degree to which a local adenoma projects into the urethra. With the information obtained in this way, in addition to that which has been previously obtained by the clinical, instrumental, and laboratory investigations, it is possible to give an opinion as to the nature of the obstruction to a degree of accuracy that is otherwise impossible.

Decision as to Further Procedure.

With the instruments *in situ*, and with the information above obtained, the type of surgical procedure to be carried out is decided upon. If it is decided to do a one- or two-stage prostatectomy the suprapubic cystoscope is withdrawn. This done, leakage of fluid from the bladder takes place, rendering it less prominent than is desirable for making a suprapubic incision. There is no difficulty, however, in exposing the anterior surface of the bladder although it is not adequately distended. This being accomplished, an assistant applies the tip of his finger to the puncture in the bladder wall to prevent further leakage, and the bladder is redistended. The extraperitoneal fat and reflection are displaced upwards and the anterior surface of the bladder displayed. The assistant now takes his finger off the puncture, and the scalpel is immediately thrust into the bladder and the incision made. Further procedure is carried out as if the suprapubic puncture had not been made. On the other hand, if electro-coagulation is decided upon, the cystoscope is left *in situ*, the appropriate terminals are attached to the catheter and indifferent electrode, and the operation proceeded with as described below.

Method of Electro-coagulation.

Controlling the cystoscope with the right hand, the prostate is brought into view; the catheter is manipulated with the left hand, the metal tip is embedded in the tissue to be destroyed, and the current turned on. At the beginning the current should be low, and should be gradually increased. The coagulating process is clearly seen through the cystoscope, and as soon as the whitening of the tissue occurs the current is turned off. The tip of the catheter is then embedded in another portion of tissue and the above procedure repeated. In this way substantial portions of the obstructing tissue and the whole of a small or medium-sized adenoma can be destroyed at one sitting. A valuable feature of the procedure is that it is often possible to see the exact portion of tissue that requires destroying, and the coagulating process can be confined to that tissue only. If during the process of coagulation the medium in the bladder becomes clouded, the bladder must be washed through as above indicated and refilled with clear water.

The destruction of tissue having been completed the catheter is withdrawn from the bladder and replaced by a soft rubber or gum-elastic catheter of large size. I have found the Marion many-holed catheter particularly suitable for the purpose. The bladder is thus drained by the urethra for three days, so that the suprapubic puncture may become sealed. On the fourth day the patient is allowed out of bed.

This paper is not concerned with the general indications for prostatectomy. The same pre-operative investigation

is necessary whatever type of operation it is ultimately decided to perform. As regards pre-operative treatment, it is specially important that infection of the bladder should be combated as far as possible before treatment by electro-coagulation.

Indications for Electro-coagulation.

Conditions suitable for treatment by electro-coagulation are the following:

1. Slightly enlarged prostates, especially those where there is only a local adenoma encroaching on or obstructing the vesical orifice, and obviously causing definite impediment to the outflow of urine. The indication is the stronger if at the same time the prostate is relatively small and fixed. It is in this type of case that electro-coagulation by this technique is of particular value.
2. "Middle lobe" obstruction.
3. Median bar obstruction.
4. The small fibrous prostate and contracture of the vesical orifice.
5. Flap formation resulting from previous operation.
6. Relief can be given to cases of obstruction in extreme old age, those suffering from intercurrent diseases, or those in which the renal function has deteriorated to such an extent as to render the ordinary operation for prostatectomy one of extreme gravity.

After-Treatment.

For two or three weeks after operation a mixture containing hexamine and acid sodium phosphate is administered. During the first few days the patient complains of bladder irritability, and this may continue in diminishing degrees for about three weeks. This symptom can be alleviated to a certain extent by giving tincture of hyoscyamus. For about three weeks after electro-coagulation has been carried out sloughs of various sizes are passed in the urine, sometimes causing temporary obstruction to micturition. In one of my cases the patient was unable to pass the slough; having tried unsuccessfully to remove it by means of a Bigelow's evacuator I adopted the following procedure. The bladder was distended with fluid and the cystoscope reintroduced at the site of the old scar. A lithotrite was passed and the slough seized and broken up under visual control. The larger portion of the slough was withdrawn in the jaws of the lithotrite, and the remainder was removed by means of the evacuator.

Complications.

Other complications that I have encountered are slight incontinence of urine, double epididymitis, and prevesical suppuration. In no case has there been any haemorrhage. One patient, aged 80, died of uraemia, a result that can hardly be attributed to the operation, since he was suffering from diabetes, was very anaemic from persistent haematuria, and had a non-protein nitrogen figure of 85 mg. per cent. In the ordinary course of events I should not have operated on this patient, but as a last resort was induced to do so because of his very persistent and copious haematuria.

Early Results of Treatment.

I have now used this technique for diagnosis alone or diagnosis and treatment in over fifty cases. Owing to lack of experience, bad selection of cases, and technical difficulties with the instruments, some of my early cases, though encouraging in their results, were not strikingly successful. Later results have improved substantially. Of the last twelve consecutive cases, one, referred to above, died; four cases, three of which came under my observation with complete retention, have been markedly benefited, inasmuch as micturition is now free and they have improved greatly in general health; they still, however, have some nocturnal frequency. The remaining seven cases may be classed as complete successes, inasmuch as they have urinary streams of good force and volume, which are passed without hesitancy or straining and without being followed by dribbling. They can retain their urine all night, and there has been a striking improvement in their general health.

As far as my present experience goes I am satisfied that, with this technique, detailed information about the prostate and vesical orifice obstruction can be obtained such as is impossible by any other means. It is therefore a definite aid to diagnosis. As regards treatment, I have had a high percentage of cases showing immediate relief, either complete or partial, but have not yet had them

under observation for a sufficiently long period to make any remarks as to the remote results.

I may incidentally mention that I have used this technique with complete success in three cases of papilloma of the bladder, in which the growth was either too large, or situated too near the vesical orifice, to be dealt with by perurethral diathermy, and have crushed a vesical stone with the ordinary lithotrite under visual control through the suprapubic cystoscope.

The instruments described above have been made for me by the Genito-Urinary Manufacturing Company, and I have to thank Mr. Schranz of that company for his technical advice and for the efficient way in which he has constructed the instruments to meet the requirements of the technique. I have also to thank my colleague Mr. Stanley V. Unsworth, F.R.C.S., for his drawing of Fig. 1.

STRANGULATED FEMORAL HERNIA.

A COMPARISON OF VARIOUS METHODS OF TREATMENT,
WITH ESPECIAL REFERENCE TO END-RESULTS.

BY

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THERE still exists some doubt as to the advisability of relinquishing the old (lower) operation for femoral hernia. H. W. Carson¹ writes: "I have been unable to find statistics of the end-results of Lotheisen's operation." It is, perhaps, for this reason that in some quarters (to judge by the reports of disappointed candidates for the English Fellowship) the inguinal route for femoral hernia is looked upon with distinct scepticism, if not actual disfavour.

In order to determine the relative values of the various operative methods I have analysed my series of cases of strangulated femoral herniae, paying particular attention to the ultimate end-results. I have chosen *strangulated* cases because there are sufficient in each group to make a comparison. It would be manifestly unfair to compare the end-result of, say, a case of strangulation operated upon in the middle of the night by the older technique with an unstrangulated femoral hernia repaired at one's leisure by Lotheisen's method.

Disadvantages of the Lower Operation for Strangulation.

The lower operation has been practised for years, and has saved thousands of lives, but it is beset with certain dangers and difficulties which, from time to time, have been recorded.

1. Resection and anastomosis within the limits of the wound is extremely difficult, and in many instances impossible. If resection is necessary laparotomy must usually be performed.

2. If the sac has been slit up in order to release a constriction high up in the neck, a loop of intestine may be reduced extraperitoneally. This is an error easily committed, and referred to by Jonathan Hutchinson, jun.²

3. The bladder is in more danger than when other methods are used.

4. The abnormal obturator artery, if cut, causes embarrassing haemorrhage, whereas, when operating from above, the artery may be seen and is accessible.

5. The loop of imprisoned intestine may suddenly retract into the peritoneal cavity after the obstructing agent has been divided, and so prevent proper inspection unless laparotomy is performed.

It so happened that it was objection No. 5 which, in 1923, finally led me to abandon the lower operation.

A woman, aged 28, had a strangulated femoral hernia of thirty hours' duration. After Gimbernat's ligament had been nicked the obstructed loop, before it could be inspected, slipped back into the peritoneal cavity. Two days later general peritonitis supervened, and laparotomy showed that a small patch of lifeless intestine had given way—evidently where the constricting band had been present. The patient died. I have never performed the lower operation since.

Analysis of Cases Treated by the Lower Operation.

Number of cases	20
Died	4
Number of recovered patients traced	10
Lump returned	5