THE
BRITISH JOURNAL OF UROLOGY

Vol. XVIII SEPTEMBER, 1946 No. 3

BRITISH ASSOCIATION OF UROLOGICAL SURGEONS SCIENTIFIC MEETING

TREATMENT OF BENIGN ENLARGEMENT OF PROSTATE

A MEETING of the British Association of Urological Surgeons was held at the Royal College of Surgeons, Lincoln's Inn Fields, on Friday, June 28, 1946, with Mr. R. OGIER WARD, the President, in the chair. The subject of discussion was the treatment of benign enlargement of the prostate.

The CHAIRMAN, in opening, said that it seemed a good moment to discuss this subject again, particularly in view of the new operation introduced by Mr. Millin. He confined his remarks to that part of treatment which was carried out by operation. As to the indications for such treatment, wise surgeons did not operate in prostatic enlargement to prevent complications which, though theoretically possible, might never arise—for example, because the patient had some residual urine which might one day develop into a large amount, or, again, because the patient had an organ which might one day become carcinomatous. Preventative surgery was always somewhat of a speculation, particularly so in the case of the age group to which these patients belonged. He also thought that most surgeons were careful not to operate for frequency of micturition alone.

Of the principal indications, difficulty of micturition was first and most important. To elicit this symptom, he usually asked the patient how many times he had to get out of bed, and, if it was apparent that when he did so he had to spend three or four minutes before he could get back again, then he considered that such a patient was likely to gain great relief from surgery. As to residual urine, there was no fixed figure, though he had heard urologists attempt to lay one down. It was not so much the amount of residual urine, it was whether the bladder was able, without excessive effort, to keep the residual urine down to a low level. If signs of stress were found on cystoscopy, he thought prostatectomy should be considered, for, if a patient had only one ounce of residual urine, yet his bladder was obviously scarcely capable of emptying itself, that patient should be treated by operation. Mr. F. J. F. Barrington, in the *Clinical Journal* of 1933, stated that, from the point of view of renal obstruction, he did not believe that back pressure affected the kidneys with less than about 13 oz., and doubted whether any operation was necessary with a residuum of less than about 7 oz. Some surgeons, however, had tried to make out that far lower amounts of residual urine might constitute a threat of uræmia. In this matter much could be learnt from excretion urography.

Operations were also sometimes necessary for recurrent hæmorrhage from the prostate, for stone and diverticulum, and of course for persistent infection.

He had been brought up on Freyer's operation. The operation had a low mortality in Freyer's hands, but in the hands of many others the mortality was very much higher.

With reference to Freyer's mortality of 4·77 per cent in 1,337 cases, it should be remembered that in those early days anæsthesia was relatively crude, and there was no sulphonamide and no penicillin.

At about the time the speaker was a resident at St. Peter's Hospital, Thomson-Walker brought in his open operation for prostatectomy, and he was attracted by the precise nature of the operation, and he used it a great deal in hospital and private practice ; but he had learned by bitter experience that it was not a good operation, for it did not arrest hæmorrhage ; and he did not like blood-loss in patients at any time. Some individuals stood it well, but others stood it very badly, and he found that often he could not determine beforehand to which class they would belong. Of course, during the operation of prostatectomy blood was inevitably lost, sometimes in very considerable amount, especially when one compared prostatectomy with such an operation as partial gastrectomy. The advantage of Freyer's operation was that it was the quickest of all operations, and when the enucleation was complete Nature was given a good chance to establish hæmostasis.

Next he turned to the Harris operation, being attracted by its good hæmostatic properties ; but, though he had many successes, he did not always get on as well as he could have wished. Cases would do extremely well for two or three days, and then in some instances there would be a rise of temperature and the patient would begin to get ill. Harris had uttered a frank warning that any sepsis carried a grave risk. Certainly it was extremely important to avoid its occurence, and Harris thought that he could do so. The danger in the Harris operation was that the obliterative sutures were placed right across the prostatic cavity from within the bladder and then passed out of the prostatic fossa into the pelvic cellular tissues, and thus acted as a path along which sepsis could spread outwards from within the urinary tract. If this occurred the commonest form was probably a limited degree of thrombosis in the periprostatic and neighbouring veins which, though it gave rise to no local signs, was shown by a rise of temperature not to be explained otherwise, and which was sometimes accompanied by evidence of septic emboli having reached some remote part of the body such as the lungs.

The last case in which he used the Harris operation was a patient with a urine that appeared clean to the naked eye, but there were two oxalate stones in the bladder and staphylococci were grown on culture of the urine. After the operation the patient was in fine form for two days, but on the third day there was a rise of temperature, with swelling of the legs. Deep pelvic thrombosis had occurred in the manner which he had just described. At the end of the third week he was dead. The entire sacrum and lower lumbar vertebræ were bare, for over them not only the skin but the whole muscular tissue had been destroyed by gangrene resulting from acute nerve degeneration produced by spreading septic venous thrombosis. To use this method in such a case was of course quite wrong according to the standards of Harris ; he admitted that error frankly. But had that patient had a simple enucleation, after the manner of Freyer, although he might possibly have had a stormy course, he would have recovered. He thought that if the retropubic operation which Mr. Millin had so successfully developed had been introduced at that time, twelve years ago, before the days of sulphonamides, it too would have been on occasions a very dangerous operation.

There was another danger in operating upon old men. The old man's chest did not always move as freely as that of the younger man, and therefore he did not breathe as freely. If after operation he got some intestinal ileus, then the diaphragm was liable to be pushed up, and thus as a result of both these factors, the vital capacity might

become seriously diminished. If such conditions were established it became increasingly difficult for the patient to drink, and thus his already damaged kidneys became still more embarrassed, causing uræmia to develop and threatening death. That would always be a possible danger with any abdominal incision in any patient, but in old patients in particular. The lower and smaller the incision the less the risk. In this connexion, perineal prostatectomy was a very safe operation from the point of view of the patient's life, and chest complications were rare—but it carried its own special risks.

In any form of prostatectomy, if there was sepsis in the field of operation—for sepsis remained always the greatest danger—the risks were inevitably greater. Sulphonamide drugs and penicillin had done a great deal to diminish and sometimes eliminate sepsis, and thus had also cut down complications such as thrombosis, septic emboli, and chest complications of all sorts. Indeed, it could fairly be said that the greatest recent advances in prostatic surgery had been the sulphonamides, penicillin, blood transfusion, and improved anæthesia. To these were due a large measure of the success in prostatic surgery to-day and the safety of the various procedures now in use. He had not yet seen Mr. Wilson Het at work—though he would shortly have an opportunity of doing so—using the operation described in the *British Journal of Surgery*, but as to the retropubic operation, he had watched Mr. Millin do four cases and had employed the method himself in a small series of cases with success, and he believed it was the safest one-stage operation available at present. He had no experience of it as a two-stage operation, but he thought the two-stage Freyer still remained, and would remain, a very good operation.

When he came out of the Army in November, 1944, he decided to give a further trial to the method of perurethral diathermy resection, which he had used a good deal in earlier days. In considering the merits of this operation it would be agreed that it was a difficult procedure, also that there was often considerable blood-loss, and it could not be used if the patient had a small urethra. But from the patient's point of view it was an ideal operation. He intended briefly to review the first 50 cases of benign enlargement of the prostate which he treated by this method after return to civil practice, omitting cases of carcinoma and stenosis of the col vesicæ. He was well aware that this was an extremely small series to bring forward, but he hoped it might serve to introduce the subject. During the same period he had done 9 prostatectomies, which gave a percentage of about 80 per cent resections, but from this he did not wish it to be thought that the high percentage of resections represented his usual practice. As to the age of the patients : 8 were in the fifties, 16 were over seventy, the oldest was eighty-six. In 38 cases difficulty of micturition was the cardinal symptom, whilst 12 were cases of chronic retention. As to the size of the prostate : 4 were small ; in 10 the enlargement was chiefly of the middle lobe ; in 26 the prostate was moderately enlarged ; in 10 it was much enlarged. One case also required diverticulectomy, while in 3 others there were diverticula not large enough to require removal. Ten cases required cystotomy before operation, or this was done at the same time on account of sepsis ; 2 cases had undergone cystostomy some months previously ; in 1 case cystostomy was required after operation because of a complication. 2 cases had also vesical calculi ; 1 case had vesical papillomata ; 2 patients had already undergone nephrectomy. In 5 patients the rectum was absent, 4 having undergone excision for carcinoma and 1 having had the canal obliterated many years ago by an injection of carbolic acid to cure piles. One other patient was awaiting excision of the rectum and had a colostomy. Resection

in two stages was necessary in 9 cases. The average weight of tissue resected was 8·1 g., from which it was apparent that he did not attempt anything approaching a total prostatectomy, and his results seemed to him to indicate that such a procedure was not necessary for success.

Turning to the results of treatment : 2 cases died. One was a patient who developed pyelonephritis after the operation. He could not offer an explanation as to the cause of death in the other patient, nor did the post-mortem examination reveal it. In 38 cases the result, as controlled by recent follow-up examinations, was good. There were 6 cases which he had not been able to follow up, but in which the immediate result had certainly been quite satisfactory. The results in 3 cases were classified as only fairly satisfactory for the following reasons : One, who was senile, was comfortable by day but often had enuresis by night ; one was not relieved of the infection which he had before operation, and still complained of frequency ; one case had a clean urine but frequency two-hourly by day and thrice by night. Apart from the deaths there was 1 bad result, for a urethral stricture had been produced by the passage of the resectoscope. The calibre of this stricture was 16 Charrière, but it seemed likely to require attention over a long period. He might here remark that he did not use a large resectoscope ; his modification of McCarthy's instrument was just less than 29 Charrière at its greatest diameter. Urinary infection : not all the urines of patients had been investigated, but of 19 cases in which the urine was cultured subsequent to operation it was found to be sterile in 11 ; of these 5 had infected urines before operation, some grossly infected. Of the remaining 8 cases in which the urine was not sterile, in 5 instances this had been infected before operation. These results compared favourably with those of any other method of prostatectomy, and should dispel the view which appeared to be held by some, namely, that an infected urine was a common result of perurethral diathermy resection. Residual urine : of 35 cases whose residual urine had been tested at an interval of many months after operation, 20 had none or less than 1 oz. ; 7 had between 1 and 2 oz., 3 had between 2 and 3 oz., 5 had between 3 and 4½ oz., the maximum. None of them complained of difficulty in micturition. Of these last five cases, one had two diverticula ; one was the case in whom a stricture was produced ; in one the residual urine was sterile ; in two the urine became infected as a result of the operation.

It had been said that after a period of years, if total prostatectomy was not aimed at when performing perurethral resection, there was a risk of a re-formation of the tumour. If so, that might of course be considered an unsatisfactory result of the method of limited resection. But surely, in such cases, a further resection could easily be carried out and with very little difficulty, if any, in getting the patient to agree to this. Moreover, if the operation, apart from the small but highly obstructive prostates, were chiefly reserved for the old and feeble, then was it not probable that age might carry away the patient in the ordinary course of events before any such repetition was required ?

No prostatic operation was satisfactory in all respects, and he therefore believed, having regard to the variation in human anatomy and human physiology and pathology, that the urologist should be prepared to undertake any of the standard operations used in prostatic surgery. As the surgeon would usually find that he was more proficient in one method than in the others, he would naturally adopt that method for preference.

Mr. WILSON HEY (Manchester) said that he knew that in many parts of the country his figures had been doubted, and he did not pretend to understand them himself ; they had been prepared by his assistant, but they were checked, and he thought they were accurate. There was no doubt about sudden decompression being absolutely safe.

In his early days he always thought that any prostate operation carried out by himself as a general surgeon was a hostage to fortune. It took him five years before he had the courage to write about his cases.

In about one case in three sent to him he cystoscoped and did nothing more. In the others, if he was sure of them, he operated without cystoscopy. He liked the virgin bladder to operate on. If he did cystoscopy he had to wait three weeks.

On the question of bleeding, in the transvesical operation which he carried out the bleeding was much less than in the operation he saw Mr. Millin do and in the Millin operation he had done himself. He had no trouble with the bleeding in his operation. The old men now never have chest trouble nor did they have pelvic or leg thrombosis, and they were able to get up on the following day. Having tried the Millin operation, he had given it up. What he wanted was an operation that was simple and easy, and nothing was simpler and easier than the operation he did. The Millin operation carried with it greater shock ; his Millin patients were never able to get up the following day, there was more bleeding and higher mortality, and he had to do a cystoscopy in every case. In one of his Millin cases he had a stricture. Perhaps he had not sufficient experience of the Millin operation.

The transurethral operation, as they all knew, had advantages and disadvantages, but he thought, on the whole, there was less shock. The transvesical operation was simple and straight-forward, and it enabled one to explore the abdomen. Something must be done to make operations on the prostate aseptic, and then prostatectomy would lose all its terrors.

Mr. H. P. WINSBURY-WHITE said that he employed transurethral resection with the electrotome in fibrous obstructions of the bladder neck and in some cases of malignant obstruction, but in cases of simple adenomatous enlargement of the prostate and in most cases of prostatic calculi he carried out suprapubic prostatectomy. He presented 95 consecutive cases of suprapubic prostatectomy for simple enlargement of the prostate, including several cases of prostatic calculi. In all of them open operation was performed and the prostatic cavity was packed with Paul's tubing ; one death occurred in this series. With him a low mortality with one-stage prostatectomy had had a definite relationship to the avoidance of pre-operative instrumentation as much as possible and to the care with which he had selected cases for this operation. Of these, 40 were done in one stage without a death, and 55 in two stages with 1 death, giving a percentage mortality of 1·05.* (*Table I.*)

He presented these figures not only as a justification for draining the bladder suprapubically, but with the consciousness that on many occasions he had been able to increase the patient's prospects of recovery by improving suprapubic drainage, especially in the presence of pyelonephritis. He had found it in the past a great embarrassment in trying to get the same benefit from urethral drainage alone. In addition to the 55 two-stage cases, there were 18 others of simple enlargement of the prostate upon which cystostomy was performed and, for one reason or another, prostatectomy had not yet been carried out ; there were 2 deaths amongst these—one in which three small diverticula of the bladder were resected at the same time, and the other which developed a prostatic abscess as the result of a pre-operative indwelling catheter. Thus the mortality rate for 73 cases of simple cystostomy was 2·7 per cent, and the mortality for the whole series of 113 prostate cases submitted to operation was 2·6 per cent.

* Since this report was made 7 additional prostatectomies (5 two-stage and 2 one-stage) have been completed, without a death, making a mortality for the 102 cases of 0·9 per cent.

Every wise prostatectomist, whenever a complication or a fatality occurs in his practice, will search his technique most carefully for a contributory cause. His own experience of this routine had enabled him to add one safeguard after another to the technique which he employed and which subsequent results seemed to have justified.

Table I.—Operations for Simple Enlargement of the Prostate showing Mortality

One-stage suprapubic prostatectomy.			
No. of cases	40		
Mortality	0		
Two-stage suprapubic prostatectomy.			
No. of cases	55		
Mortality	1		
Total number of prostatectomy cases			95
Mortality	1	(1·05 per cent)	
Suprapubic cystostomy.			
Permanent or awaiting second stage	18		18
Second-stage performed	55		
Total	73		
Mortality	2	(2·7 per cent)	
Total number of cases operated on for simple prostatic enlargement			113
Mortality :	3	(2·6 per cent)	

Table II.—Reasons for the Two-Stage Operation in 55 Cases of Prostatectomy

	Chronic retention requiring gradual decompression	Gross urinary infection (generally with chronic retention)	Vesical diverticulum (generally with chronic urinary infection). (All diverticula resected)	Acute retention and infection of urine	Severe hæmaturia or clot retention	Chronic hæmaturia	
No. of cases	6	8	10	8	5	1	

	Poor general condition	Poor renal function	Pyelo-nephritis	Renal calculus	Hyper-piesis	Cardio-vascular disease	* High blood-urea as chief complication	TOTAL
No. of cases	5	1	1	2	3	1	4	55

* Many cases in the foregoing groups also had the blood-urea raised.

The chief points he would emphasize were as follows :—

1. Routine pre-operative blood-counts, to avoid, wherever possible, operating on anæmic patients.

2. Routine pre-operative observations on the blood-pressure to avoid doing one-stage prostatectomy on patients with hyperpiesis.

3. Dispensing whenever possible with pre-operative indwelling catheter drainage.

4. Whenever practicable, to carry out cystoscopy as an immediate preliminary to the operation.

5. Open prostatectomy in all cases, for the purpose of excising a wedge from the posterior margin of the prostatic cavity by diathermy, giving strict attention to bleeding points and the removal of tags from the prostatic cavity.

6. The packing of the prostatic cavity with Paul's tubing, thus preventing the formation of clot in this situation.

7. Taking special care with regard to urethral instrumentation carried out as a precaution against post-prostatectomy obstruction.

8. Two-stage prostatectomy in all cases with intercurrent disease, or complications of the prostatic enlargement—as set out in *Table II.*

9. Having carried out suprapubic cystostomy, care should be taken not to proceed to the second stage until satisfied that the full benefits of the cystostomy had been obtained.

In carrying out cystoscopy—which it is his practice to do whenever possible on a case of enlarged prostate—there was always the danger of a complication from the cystoscopy, such as infection, acute retention, clot retention, pyelonephritis, etc. These dangers furnished the reason why he liked to cystoscope the patient whenever possible as an immediate preliminary to operation.

Renal functional tests were carried out previously by excretion urograms and blood-tests.

Pre-operative indwelling catheter drainage was very apt to set up inflammation in the already pathological prostate, and pyelonephritis, pelvic cellulitis, and even lung complications might follow from this procedure. The proof of prostatitis from the catheter was often seen in the œdema present in the prevesical space when this was exposed at operation. It was an interesting contrast that late in the convalescence following prostatectomy an indwelling catheter was relatively harmless.

He would not say that there were no indications for pre-operative indwelling catheter drainage. On the contrary, he recalled one case where he was definitely thankful to be able to make use of it. It was one of the two-stage cases in this report. The patient was 72 years of age, with chronic retention and infected urine, with blood urea of 205. In addition to the enlarged prostate there was a large vesical diverticulum. After three days of indwelling catheter drainage the blood-urea was 30, and he was able to resect the diverticulum, and later to do a prostatectomy. Post-prostatectomy instrumentation for the purpose of safeguarding or remedying post-prostatectomy obstruction was also a danger to the unhealed prostatic bed, especially in the early part of the convalescence. A case with a short convalescence might escape the risks of post-operative instrumentation because there were no symptoms to suggest the prospect of obstruction at this time ; again, sometimes the patient might be spared the investigation because the surgeon chose to disregard altogether the possibility of post-prostatectomy obstruction.

The question of two-stage prostatectomy was a controversial one. This was because the method was capable of being employed in such widely different ways,

and the need for it varied so much with different surgeons. He had employed the two-stage procedure in 55 cases for the reasons shown (*Table II*). He could not subscribe to the view that cystostomy as a preliminary to prostatectomy necessarily carried with it a high morality. His personal experience was that mortality was largely dependant on the technique which was employed. Like the operation of prostatectomy itself, suprapubic cystostomy required the exercise of sound judgment as to when and how to open the bladder and what pre-operative and post-operative measures should be carried out. The bad results, admitted so freely on all sides, themselves declared the need for care. From his own cases he found there was a considerable difference in mortality in relieving chronic retention according to whether he had decompressed by indwelling urethral catheter or by suprapubic watertight stab puncture, made after exposing the bladder. There was no mortality from any case of retention in this series where the retention was relieved simply by stab puncture.

His view on the assessment of the relative values of the various procedures for the relief of prostatic obstruction was that this could be done only by a careful inquiry into after-results. It would be a great service to surgery if the Association would undertake such an investigation. A questionnaire might be sent out perhaps on the following lines :—

1. Number of operations performed on one case.
2. Length of time in closing of fistula.
3. Is there persisting infection ?
4. Are there signs of post-prostatectomy obstruction ?
5. Is there any urethral stricture ?
6. Is there any residual urine ?
7. Is there any incisional hernia.
8. Longevity.

By sifting out and analysing the data thus obtained, the Association might be able to lay down some sound rules concerning prostatectomy.

Mr. ARTHUR JACOBS said : I shall report on further experiences with the retropubic method of prostatectomy and give a critical review of my results. Since my initial prostatectomy by this method just under seven months ago, it has been my routine procedure on all patients requiring prostatectomy and considered suitable for a one-stage operation.

With regard to the technique of the operation, I have not introduced any modification of Mr. Millin's methods. I spend but little time on the prostatic veins coursing in the endopelvic fascia. If one or more obtrudes itself into the field through which the incision in the prostatic capsule is to be made, it is tied off. The capsular coverings are incised transversely in one layer and any obvious bleeding point which follows this incision is caught with a hæmostat, which is then touched with the diathermy needle and removed. By making gentle traction on a stay suture passed through each flap, visualization of the prostate is enhanced and the initial freeing of the lower extremities of the lateral lobes with scissors is made easier. Again, when the prostate has been removed, traction on the two flaps aids the inspection of the cavity and facilitates the insertion of a suture to tack the bladder neck to the posterior urethra or the cutting of a wedge from the bladder neck when either of these steps is deemed advisable. I suture the capsule in one layer, either transversly or vertically, depending on which direction the flaps are most easily approximated. I can generally accomplish the operation within 30 minutes. The chief adjunct to an expeditious performance is good

suction, which will keep the field clear and obviate the need of dealing with bleeding points, which will, in any event, be controlled once the capsule has been sutured.

Mortality.—I have had 5 deaths amongst 63 patients on whom I have carried out retropubic prostatectomy. Another patient died of ulcerative endocarditis four weeks after operation. Three of the deaths were due to cardiac failure and two were directly attributable to post-operative complications. Of these latter two, one died on the ninth day after an initial uneventful convalescence. The patient had been up and voiding urine on the fifth day and there was no urinary leakage. On the following day, he complained of pain in the left iliac fossa and there was evidence of a commencing ileus. This gradually increased, in spite of active measures to combat the distension. By the eighth day there was an obvious fullness in the left flank and several ounces of urine were evacuated from the retroperitoneal plane through an incision over that site. He died from toxæmia. The other died on the twelfth day after operation. He also had been making an uneventful convalescence until the third day, when his catheter cut out. Attempts to reinsert the catheter were unsuccessful and he was allowed to distend until the following day, by which time he had voided no urine. The upper end of the incision was opened and a suprapubic tube inserted. He did well for the next few days then developed pyelonephritis and died from uræmia.

Mortality figures for any one method of prostatectomy should be accompanied by the total number of cases operated on and the methods employed. By relegating poor risk cases to suprapubic cystostomy and then submitting the survivors to a second-stage operation, a mortality rate for the favoured method can, to a large extent, be regulated to what the surgeon cares to make it. In the period that I have been carrying out the retropubic operation, I have been employing transurethral resection for the fibrous and the smaller types of fibro-adenomatous glands. Only those patients who had gross renal impairment and were therefore in need of prolonged drainage or who had marked cardiac lesions or a combination of these conditions, had suprapubic cystostomies. Retropubic prostatectomy was performed on all the others. The following table is an analysis of the total cases operated on in the period under review :—

OPERATIONS FOR BENIGN PROSTATIC OBSTRUCTION
DECEMBER, 1945, TO JUNE, 1946.

		Mortality
Total operations performed	82	6
Retropubic prostatectomy	63	5
Transurethral resection	9	1
Second-stage prostatectomy (1st-stage before Dec.,1945)	2	0
Suprapubic cystostomy	8	0*

* One patient suffering from a malignant liver died in 6 weeks, and another, who had an initial blood-urea of 266 mg. per cent, died of uræmia in four months. It is considered that 4 of the remaining 6 cases may become suitable for a second-stage prostatectomy.

Post-operative Complications.—An uncomplicated convalescence after retropubic prostatectomy should be characterized by absence of pain, a urinary output free from gross hæmaturia, ability of patient to be out of bed in 3 to 6 days after operation, easy voiding of urine on removing the indwelling catheter, the absence of suprapubic leakage or of any infected discharge from the site of drainage at the lower end of the wound, and a patient ready for home in 12 to 16 days. Such a smooth and quick convalescence can indeed be obtained with the majority. Complications do arise,

however, which may interrupt this expected smooth recovery. I would group these possible complications under the following headings : (*a*) displacement of catheter ; (*b*) hæmorrhage ; (*c*) urinary leakage ; (*d*) wound infection.

a. Displacement of Catheter.—I have mentioned one case where failure on the part of the attending surgical house officer to reinsert the catheter and subsequent cystostomy was followed by pyelonephritis and death from uræmia. I have also, on a previous occasion, described how when I found I was unable to reinsert a catheter that had become displaced whilst the patient was still on the operating table, I immediately established suprapubic drainage. This patient made a good recovery and went home in four weeks with the sinus closed. Another patient unwittingly pulled out his catheter a few hours after operation, but I was able to reinsert it without difficulty.

b. Hæmorrhage.—I have had no cases of secondary hæmorrhage sufficiently marked to necessitate opening the bladder. One who had had a persistently blood-stained urine throughout the period of post-operative catheter drainage, was unable to void urine when the catheter was removed. A collection of small clots were removed by syringe suction through a gum-elastic catheter which was tied in for 24 hours, after which there was no further trouble. Another patient after a bowel movement delayed until the fourth post-operative day, had a clot retention which required to be cleared by syringe suction. The same patient had a second bleeding on the seventh post-operative day, again following a bowel moment. A catheter had to be reinserted and clots again evacuated by syringe. Two other patients had bleeding with clot retention, on the second and sixth days respectively. The clots could not be evacuated through a catheter, but were easily cleared through a uretrhal canula.

c. Urinary Leakage.—The absence of any suprapubic urinary leakage after the retropubic operation is not the least of the attractions which this method offers and not only adds to the comfort of the patient but diminishes the demands on the nursing staff. When leakage occurs, these particular advantages are lost and convalescence may be delayed. The reinsertion of a catheter for 48 hours is, however, all that is usually necessary to stop the leakage and I have had no experience of a persistent fistula.

d. Wound Infection.—A characteristic feature of the operation is the primary healing of the wound down to the small sinus which is left after the drain from the lower end of the incision is removed. I have had 2 cases of serious wound infection. One occurred in one of the patients on whom I had to pass a urethral canula for clot retention. The manipulation was followed by urinary leakage, then the lower half of the wound gaped and there was a purulent discharge. He went home, however, with the wound closed in five weeks from the time of operation. The other had had prolonged catheter drainage before he came under my care and at the time of operation had a pronounced urinary infection which I had been unable to clear. He had urinary leakage after removing the catheter on the sixth day. This persisted to a variable degree for three weeks and was accompanied by a seropurulent discharge. Almost the whole length of the incision ultimately opened up, though this was only skin deep. It was allowed to granulate and was completely healed in seven weeks.

Conclusion.—In the foregoing remarks, I have deliberately emphasized the complicating factors that may be encountered in association with the retropubic operation. It is idle to claim that a recovery without incident can follow all prostatic operations whatever method is used. The fact is, however, that what constitutes a complication occasionally occurring with the retropubic method, is the normal course of events with certain of the suprapubic methods.

Mr. E. W. RICHES said that the Chairman had given the general indications for operating on the prostate, but it was also important to consider the indications for a two-stage operation. He gave these as chronic retention of urine, renal insufficiency as indicated by a blood-urea of more than 60, bladder infection, cardiovascular disease, and intercurrent infection (pneumonia, for instance, with developing acute retention).

Many had mentioned the value of having suprapubic drainage after prostatectomy, and there were similar advantages in this as the method of preliminary drainage, but there was a reluctance to do a two-stage operation because of the difficulties in the second stage due to scarring, and the fact that one was no longer going through virgin soil. He now used his own method of suprapubic catheterization* for preliminary drainage whenever the bladder was or could be distended. The fistula would heal within a matter of hours after the obstruction was removed and infection had been eliminated. Even before endoscopic resection, it was much easier—and the blood loss was less—if one had a small suprapubic catheter in.

He was a great believer in the Harris operation and had done it for about 13 years, using a transverse incision. One of the important principles that Harris gave was the early restoration of the mucous membrane on the floor of the urethra. After operation, whether Harris or endoscopic, he still liked to leave in a small suprapubic tube, preferring this to the indwelling urethral catheter.

Coming to the retropubic operation, he had been feeling his way with it, and had done some 40 cases ; he thought it had so many advantages that one must persist with it. It was the direct route to the prostate and so obviously right that one could only wonder why nobody had practised it before ; this might be said of all great discoveries. But it had some disadvantages. There was rather a vascular field to traverse, and there was more blood-loss during retropubic than a Harris prostatectomy ; transfusion was more often necessary. Bleeding after operation, however, was controlled better than with a Harris. There were other disadvantages, such as œdema of the penis, but the main fault of the operation as originally described was that no attempt was made to restore the continuity of the mucous membrane on the floor of the urethra, and the bladder neck was left just opening somewhere into the prostatic cavity. In the first 25 cases done on standard lines he had seen the complication of post-operative stenosis at the bladder neck on four occasions. Since those cases he had combined the Harris retrigonization stitch with the retropubic approach, and using a small suprapubic catheter instead of the urethral catheter. This appeared to be the best combination at present ; there was nothing to stop the patient starting to pass urine immediately after the operation, and the small tube could be left in for ten days or as long as desired. There was one other complication that he had seen for the first time in his own practice since using this operation—namely, osteitis pubis. It was due to injury of the periosteum behind the symphysis, and he had encountered it in two cases.

One other point had to do with the cardiovascular condition of many of these patients. Some years before the war he asked a cardiological colleague to see all his prostate cases. He cited a series of 23 consecutive cases done seven or eight years ago, chosen because they were all seen by the same physician, and had a complete cardiological examination. Out of those 23 cases, 3 died within the first three months, the cause being coronary thrombosis in two cases, and cardiac failure in one, and the period of survival being 17 days, 6 weeks, and 3 months respectively. Of the 20 survivors

* *Lancet*, 1943, 2, 128.

it had been possible to trace 16. One died a year and eight months after operation ; he had gross hypertension. Four others lived for five years or more, and one could have foretold their mode of death from the cardiological investigation ; two died of cerebral hæmorrhage, and two of ' senility.' The remaining 11 were alive and well seven or eight years after operation. This investigation might not help much in treatment, but it did help a great deal in prognosis, and he had now resumed it, feeling that every prostatic case ought to be seen by a cardiologist.

Mr. W. W. GALBRAITH (Glasgow) said that prostatectomy provided a fertile ground for the activities of the Association. A " Leader " in *The Lancet* of December 1, 1945, entitled " Eureka " stated : " The suprapubic operation generally practised to-day carried the immediate risk of hæmorrhage and infection. It has a mortality considerable in the hands of the occasional urologist, and by no means negligible in those of the expert."

That was not an untrue picture of prostatectomy as practised by general surgeons to-day in this country, but he was quite sure it was not true of prostatectomy as practised by members of this Association. He thought it was their duty and privilege to educate general surgeons to improve the general standard of work on the prostate.

One factor he considered to be of almost cardinal importance was that the urological surgeon should have the co-operation of a skilled physician. For fifteen years he had had a physician attached to his unit and he never considered operation until the patient had been thoroughly examined by that physician with special reference to his cardio-vascular condition. The physician must co-operate, and he found that a man who had developed skill in this line and who knew the different procedures used for prostatectomy was of great help in assessing the operation most suitable for the patient. The day before the operation he had a conference with him and with the anæsthetist. He thought that some of them made a great mistake in rushing prostatectomy without adequate examination and consultation ; in fact, he knew surgeons who did not see the patient until he was on the operating table. The surgeon who was going to do the operation must examine the case himself before he decided on the operation and not leave this to juniors.

As for the operation itself, there were four or five different prostatectomy operations and they must be guided in their decision as to which they used by the condition of the patient concerned and their own ability to perform any given operation. The operations he used were the Freyer or its modifications, the Harris, the retropubic, and transurethral resection. He would never lay it down as a rule that one operation suited every case. The Freyer operation or its modifications was of value in the old cardiovascular, bad-risk patient where operation time must be limited to ten minutes. Where the prostate was fibrous or malignant his operation of choice was transurethral resection. He had been an exponent of the Harris operation with immediate closure and had done it for 12 years, but he would not be foolish enough to suggest that this was the best operation. The prostatectomy mortality rate achieved by people like those he was addressing, whatever operation they did, should be under 5 per cent. In his own case 277 prostatectomies were performed with a death rate of 4·7 per cent, but that included any mortality occurring within two months. If one was giving a demonstration it was better to use a vertical rather than a transverse skin incision, but his Sister commented on his use of the vertical incision, " I wish you would go back to your small transverse incision because the patients are so much more comfortable with it." Using the Harris retractors with the small transverse incision a perfect exposure was obtainable.

The convalescence in Harris operation cases had to be seen to be believed. The patients were wonderfully well even the next morning, and fit to enjoy reading the morning newspaper. Some people mentioned strangury after operation; it hardly existed. What were the complications? Pelvic cellulitis? He had had only one in this series. Leakage was very rare and fistula unknown. What were the late results? Stricture was mentioned. In 1 per cent of his cases there had been some stricture, but it was easily dealt with in the usual manner. He had followed up a consecutive series of 171 cases at yearly intervals for 12 years, and he was amazed how well they were. They told him about other things, but a good many of them forgot to mention anything at all about their bladder.

What was the average expectation of life after prostatectomy? He had inquired of one of the insurance companies the other day. According to their tables, for a man aged 67 in good health, the average expectation of life was 10·18 years. Out of 36 patients of an average age of 68, on whom Harris prostatectomy had been done, 7 had survived ten years and 29 out of 61 were well five years afterwards.

If the Harris operation had proved so satisfactory in his hands why was it not popular? The retropubic operation appeared to be an advance. What had pleased him about Mr. Millin was his singular modesty. He realized that the operation was in its early days. He had watched Mr. Millin do two cases and it was a delight to see his beautiful technique. It was not an operation for the general surgeon but for the expert in urology. His own experience was too small to be worth talking about. He had done only 23 cases. In the average case it gave a very fine result. What complications had he had? He had had the catheter become blocked with clot, and the other he had had was a suprapubic fistula. He was quite satisfied that these retropubic patients were as easily dealt with from the nursing point of view as the patients who had undergone the Harris operation.

He had been surprised when examining candidates for a Fellowship to learn that they had been informed that a one-stage prostatectomy had a mortality rate of 30 per cent, and a two-stage prostatectomy 4 per cent, and thus no one should do a one-stage prostatectomy. There was evidently at least one school where this nonsense was taught.

Mr. W. K. IRWIN (London) said that in 1937 he published a paper in which he stated that fashions change in the field of prostatic surgery with almost, if not quite, the same bewildering frequency as in that of dress. To-day this appeared to be more true than ever. He did a Freyer-like prostatectomy and in the majority of cases used the two-stage technique.

In a recent series of 123 consecutive hospital cases on which he had operated he had only 3 deaths, two after the first stage and one after the second stage. One of these patients who had suffered from heart disease for a long time died from cardiac failure after the first stage. The second, who had been treated for duodenal ulcer, suffered from a profuse hæmorrhage and died also after the first operation. The third patient, who had very marked arteriosclerosis, succumbed from a secondary hæmorrhage ten days after the second operation. These 123 cases had not been selected for operation with a view to statistical records. On the contrary the series included all the most unpromising admitted to hospital.

The first stage or preliminary cystotomy was, in spite of the high mortality it is said to carry, a minor operation. The second stage was a short, safe, and satisfactory procedure. He had done it with pentothal alone and could not think of any other prostatectomy technique where there was so little shock. In fact his house surgeon

told him that in 70 per cent of the cases there was no shock whatever. He had not had any indication of pyelonephritis for years and not only the immediate but the end-results were good. One great advantage was that, working inside the bladder, one could make absolutely sure that there would be no post-prostatectomy obstruction at the vesical neck. In his opinion this could not be done with an extravesical operation. Also by using the two-stage technique one cut down to a minimum the use of the catheter, which to some patients is an instrument of torture and to all a method of treatment conducive to sepsis. Some surgeons said that the two-stage technique took too long. It may necessitate a little longer stay in hospital than some other operations, but, as Mr. Morson has very wisely pointed out, he is a foolish surgeon who hurries his prostate cases out of hospital. He was convinced that many of the complications which follow prostatectomy could be avoided by using the two-stage operation. He felt sure that by using this technique and given good nurses and good house surgeons the mortality could be kept down to or below 3 per cent.

With regard to the so-called retropubic operation Mr. Riches had said it was surprising that there had been no direct approach before. But this direct approach had been used off-and-on for 40 years. It was used on 1906 by Zuckerkandl, in 1909 by Van Stockum, in 1922 by Lidski, and 1933 by Jacobs and Casper.

Mr. BERNARD WARD (Birmingham) said that accuracy in statistics was notoriously difficult to attain. There had been a controversy recently in the medical press, initiated by Mr. Wilson Hey, on the dangers of the catheter. He himself had been passing catheters for 35 years and had found no particular danger in doing so ; his patients were not converted into invalids by it. It could only be that the technique of passing the catheter was not properly understood. There might be a great deal of difference in the passing of a catheter by different surgeons ; it was largely a question of touch, and he never used a local anæsthetic to pass one. A really sound opinion or prognosis could not be given without estimating the residual urine by catheter.

In patients with *chronic retention* the first stage of prostatectomy should only be done after the bladder had been gradually decompressed. At the time he started practice, the death-rate from suprapubic drainage was high, but it should not be high to-day, if, to start with, the bladder was carefully decompressed with an indwelling or a suprapubic catheter. It would nearly always be found that in the early stages of decompression there would be an immediate and rapid improvement in renal function, and a further improvement when the suprapubic tube was put in. To say that it was safe to undertake rapid decompression in prostatectomy in a case of that sort was to speak another language from that with which he was familiar. Mr. Wilson Hey's statistics showed 75 per cent of his fatal cases were due to uræmia. This speaks for itself !

An important point with regard to the two-stage operation was this : the first stage consisted in opening the bladder, and with the finger in the bladder it was possible to estimate the prostate and the chances of removing it far better than in any other way. But one must have noticed the non-contractile bladder (what he calls the wooden bladder) and the difficulty of finding the prostatic outline, so that one wondered how it would be possible to enucleate the prostate at all, and the extraordinary difference after 2-3 weeks' drainage when the bladder was soft, contractile, and the prostate soft and mobile, with the line of enucleation well defined.

Although the danger in passing a catheter was infinitesimal, it was different with the passing of a cystoscope. A straight instrument passed through a tortuous urethra was

bound to cause damage. The immediate operation of prostatectomy for retention of urine went against everything that his experience had taught him.

Concerning treatment of enlarged prostate in old men, one never lost anything by waiting, but one might lose a great deal by being too precipitate. Prostatectomy was not an immediate operation—not an operation of urgency—and he had never regretted waiting. With regard to technique, for the last 35 years he had tried all the operations as they came along, one after the other. He gave up the Harris operation because he found that it did not control hæmorrhage, and the functional results were not to be compared with those following the one or two-stage enucleation. His practice had been for the last twenty years to paralyse the internal sphincter, and throw the bladder into the prostatic cavity. All he could say was that the functional results were excellent. He was not afraid of the indwelling catheter, and he much preferred it to a suprapubic box. He never now got a suprapubic fistula, which arose as a result of the prolapse of the vesical mucous membrane into the wound.

He had tried Mr. Millin's operation only on 7 occasions. In trying out a new procedure he always tried it on the good cases and not on the bad. So far he had had no mortality, and he had been astonished at the after-progress of the patients, the lack of hæmorrhage in the bladder, and the comfort and shortness of convalescence. The after-results so far had all been satisfactory.

Mr. J. B. MACALPINE (Manchester) said that stricture of the urethra was practically unknown in his practice. The lining of the cavity which was left after prostatectomy contained the torn acini of multitudinous remaining prostatic glands and these pre-epithelialized the channel. He had always attempted to destroy the internal sphincter and the flap, but it was unnecessary to stitch down the flap of the trigone into the bed of the prostate. If excretion urograms of patients in all cases were taken, more dilatation of and injury to the upper urinary passages would be found than they had been led to believe.

Mr. H. G. HANLEY (London) said that he gathered that most surgeons who performed prostatectomy frequently attained much the same degree of success with any type of operation. Far too many patients came up for surgical treatment when they had chronic uræmia. Of 253 cases of prostatic obstruction seen during $3\frac{1}{2}$ years, 49 per cent were admitted with retention of urine. The over-all death rate of these retention patients was 33 per cent. The total prostatectomy mortality was 5·3 per cent.* Their object should be to get patients to come to hospital before this advanced stage of uræmia developed.

Mr. F. J. MILWARD (Chesterfield) said that before starting with Millin's operation he carried out the Harris operation for a number of years. In 210 cases with the Harris he had a mortality of 4·5 per cent, and found it a very satisfactory operation. Only an occasional case had to be washed out, they did not leak, and in only one case was there a pelvic cellulitis. But a considerable degree of selection was necessary, and he could not carry out the operation safely on poor-risk cases. Therefore he turned to Mr. Millin's operation. With this he had had 3 deaths, one of them from heart failure twelve hours after operation. In another case the death was due to gross error of diagnosis, the fact that the prostate was carcinomatous being missed. The patient died one month later from general wasting. The third case, which had bilateral hydronephrosis, succumbed from renal failure four weeks after operation.

* But in non-retention cases it was only 2·04 per cent.

Mr. HUGH DONOVAN (Birmingham) said that since 1936 he had practised the perineal operation, having learned it from Hugh Young in America. He had operated on 131 cases for simple enlargement, with 9 deaths. The operation was a very benign procedure. The patient was got out of bed on the fifth day and there was good hæmostasis. He had had 3 cases of stricture formation. He knew of only 2 of the patients who were persistently incontinent, though some degree of temporary incontinence lasting a few weeks was not uncommon. In enucleating the prostate from below the internal sphincter was left unincised. The operation allowed dependent drainage—an elementary and vital surgical principle.

Mr. W. E. M. WARDILL (Newcastle-on-Tyne) said that not one of the speakers had suggested what could be done with the old men who were sent into hospital with retention. Most of the cases which had figured in that discussion were selected ones. In Newcastle, making no selection at all, the mortality rate during the past year had been 13 per cent; this was not the mortality of prostatectomy, it was the mortality of the disease. This year there had been 164 cases, with 8 deaths, roughly 5 per cent. There had been no selection. The ages of the patients had ranged from 95 downwards, the average age being 72. He felt that in any operation which was performed on the prostate in selected cases a small mortality could be expected. They believed in Newcastle that it was safer to drain the bladder through its natural channels, i.e., to resect the prostate, rather than to adopt any other form of drainage. The question of strictures had been mentioned. He had just come back from America, and there he did not see one stricture.

Mr. TERENCE MILLIN said that with regard to his own retropubic operation he was not foisting it on anybody. An operation that suited one patient or one surgeon would not suit another. He had modified the retropubic operation in the matter of dealing with the bladder neck, because he had experienced 5 cases of bladder-neck obstruction in his first 75. He then tried the posterior Harris stitch, but dropped that on encountering a case of secondary hæmorrhage on the fourteenth day. He thought that if the posterior stitch gave way the trigone retracted and a secondary hæmorrhage might ensue. It occurred in this case on the day the patient was leaving hospital. He now preferred the wedge resection to the posterior stitch.

The incidence of stricture after the punch was very high. The resection centres in the U.S.A., he was told, were worried about it, and he, too, had been worried when doing large resections, and employing the standard 30F. sheath. Reed Nesbit now used a perineal urethrostomy in 33 per cent of his resections.

Surely the candidate for prostatectomy had to be considered as a patient, not as a large prostate. The cardiovascular system was often what let them down. Mr. Hey had not told them how he dealt with the septic bladder. He did think it was important to have adequate drainage.

In the retropubic operation, blood-loss, he thought, was largely dependent on the operator. If the people were going to take two hours to do the operation they were going to lose a lot of blood. His own loss averaged about 6 oz. He had done about 184 retropubic operations. About 4 per cent had been two-stage procedures. In future he thought these might form a larger proportion, perhaps 10 per cent. He was getting a little afraid of the grossly distended bladder. If a man was not fit after two weeks' catheter drainage a high cystostomy was done.

Mr. H. H. STEWART (Bradford) spoke as one associated with both a municipal and a voluntary hospital. There were no means of escaping these bad cases which came into hospital. A series of 879 cases had been admitted; he had operated on 752, in

about 650 of them, or 80 per cent, by the perurethral route. He believed this to be the operation of choice. If the urethra was not of sufficient calibre the case was rejected for perurethral operation. He did not think there need be any particular horror of catheterization. It was very much a matter of nursing.*

Mr. WILSON HEY said that he appreciated and admired Mr. Bernard Ward and liked his story. He agreed with him on two things, that it was a wise father who knew his own child, and, secondly, that the bladder and the prostatic cavity should be made into one. Rapid decompression was dangerous unless the operation was done aseptically and unless the prostate was removed at the same time. The prostate did frequently obstruct the ureters.

With regard to culture, he could not have a real culture of the urine after operation, because he would not pass a catheter. He had taken mid-stream specimens, and two-thirds of these on culture were found to contain organisms. With regard to Mr. Millin's point about pelvic cellulitis, he knew nothing about it : he had never seen it. He stitched up the bladder most securely. As long as he himself did not introduce a special strain of staphylococcus or streptococcus the patient would not get cellulitis however purulent the urine might be.

All the evidence he could get about his patients with his aseptic operation was by the descending pyelogram, by the electrocardiogram, and by blood and urine investigations. He often had patients examined by the cardiologist, who reported that the chances of coronary thrombosis or similar cardiovascular troubles were increased if there was sepsis or uræmia. He did not use the cystoscope often, and that was the weakness of his procedure. He had learned a great deal from the discussion.

Mr. OGIER WARD, from the Chair, in closing the discussion, said that it was extraordinarily interesting to see what divergence of opinion there was as regards prostatectomy. It was interesting also to note that the protagonists of each method had achieved such high measures of success, and there was therefore little reason why they should depart from the methods which they preferred.

Everyone would agree that cases should come earlier for treatment. Surgeons working in hospitals like St. Peter's saw the very worst type of case, very different from those private cases which came from a watchful general practitioner. But there was a more important factor which made for difficulties : during the whole of his surgical life he had suffered from not having enough beds. He had never had a clinic of his own of 25 to 50 beds directly under his control, and he was sure his prostatic surgery had suffered on that account. Anyone who controlled a clinic, with his own assistants and his own nurses, should get very much better results than the surgeon who had to operate in one place one day and somewhere else the next. Assuredly a great deal of credit was due to the nursing staff who were responsible for the after-care of these patients. Their work was extremely exacting, but when the nurses were keen and well-trained then good results should always be forthcoming. An effort should be made to ensure that genito-urinary surgeons had their own clinics where they could really control the work that was done. It would be recalled that in the Survey which the Association had just submitted to the Ministry of Health one of their strong recommendations was thst such units should be autonomous. When this was forthcoming results would be better whatever particular form of operation the urologist might choose to employ.

* If the urethral secretions were allowed to dry and form a scab at the meatus around the indwelling catheter, a urethretis would develop in a very short space of time. Daily baths and cleansing of the outside of the catheter were therefore essential.