RETENTION OF URINE AND PROSTATECTOMY

A REVIEW FROM A SMALL PROVINCIAL HOSPITAL

BY

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"When surgeons gather together to speak about retention of urine they all tell us how old their patients are. We never believe them. However, I would like to assure you that my patients are not only very old but are very very decrepit."

—A. DICKSON WRIGHT.

Lee *et al.* (1957) contrasted the mortality for prostatectomy for "hyperplasia of the prostate" in teaching and non-teaching hospitals. The relative percentages were 6.2 and 17.1 in 1951, improving to 4.1 and 9.5 in 1953-4. They pointed out, however, that the teaching-hospital figures showed a smaller proportion of older age-groups and fewer "immediate admissions"—presumably cases with retention of urine. Riches (1950) quotes figures from specialist urological units with a mortality varying from 3.7% to 6%, but gives a figure of 28% for cases in a general hospital treated by suprapubic cystostomy. Bomford (1959) records a small series of patients with retention, with a mortality of 13% (7 out of 55), but only four of the seven had had prostatectomy, and he does not give the proportion of cases treated by prostatectomy or other methods. Ellis and Leatherdale (1958) report a mortality of 10.7%. Their series, however, is a selected one, as they cover only those cases thought fit for a one-stage prostatectomy—in fact, they advocate permanent suprapubic or catheter drainage in the poor-risk case (see below).

McEachern (1958) gives the mortality "from diseases of the prostate excluding carcinoma" for Australia in 1954 as 14.3% and reviews a personal series of 222 consecutive cases, with a mortality of 6.7%. His mortality for cases of retention submitted to prostatectomy was 7.8% (13 deaths in 165 cases), whereas the mortality was only 3.5% (2 deaths in 57 cases) in patients without retention. He does not discuss those cases admitted with retention who were unfit for prostatectomy. McEachern's series is very similar in number of composition to the present one. This comprises those patients suffering from retention of urine or from symptoms attributable to prostatic enlargement who were admitted to the general surgical wards of a small hospital under the care of one surgeon in a provincial town in Northern Ireland during the period 1955-9. In this five-year period 197 patients were admitted with prostatic disease. Of these, 140 were cases of retention and 57 were patients with signs and

symptoms of prostatic disease without retention who were admitted for interim prostatectomy. Of these 197 men, 28 (14.2%) died, but 27 of the deaths occurred in those presenting with retention—only one death resulted from "cold" prostatectomy (Table I).

Social Background

Before considering further this appallingly high mortality rate the social and hospital background must be explained. The area served by the hospital is predominantly a farming one. The men often refuse to attend hospital until the onset of retention. If the "immediate admissions" of Lee *et al.* (1957) include all retentions, as they presumably must, then a maximum of 44% of teaching hospital cases and 61% of non-teaching hospital cases have retention. In the present series 71% had retention on admission; a figure comparable with that of McEachern (1958), who had 74% in his Australian series.

In many instances patients were admitted only after the failure of relief following catheterization by their own doctor. Of the 140 cases, 61 (43.6%) had been catheterized at least once before admission. In McEachern's series only 15% had been catheterized outside hospital.

This delay in attending is shown also by the relatively low proportion of interim prostatectomies, although this is not the reason for the marked difference in mortality in the two groups. There is obvious selection in those cases seen at the out-patient clinic with prostatism—only the relatively fit case or the one who could be made fit being subjected to operation in the absence of retention. However, the average age of the two groups is not really different (Table I).

A further social consideration explains why 133 of the 140 cases of retention were treated by prostatectomy. It is realized that many of those who died after prostatectomy might have survived (for a few weeks or months) with simple suprapubic drainage, but many of these old men were living alone or with an equally aged spouse, and the management of a permanent suprapubic catheter under such social circumstances is well-nigh impossible. This is epitomized by my medical colleague in writing of a patient who was initially under his care with cardiac failure and who had a suprapubic cystostomy done elsewhere two months before. The patient died after prostatectomy, and Dr. E. L. Wilson, in the letter to the general practitioner, says, "This was too much for him. One cannot, however, really regret that this step was taken, since he found life, as he was, intolerable." Similarly, McEachern (1958) says, "Many of these cases should have had no more than a permanent suprapubic cystostomy, but it is felt that this is often unacceptable in modern society."

The hospital concerned has no bacteriological, haematological, or biochemical laboratory attached, and, although a very efficient service in these specialties is provided from a centre 40 miles (64 km.) away, there is an inevitable delay in obtaining the results of investigations. For this reason routine pre- and post-operative urine cultures, blood urea, etc., have not been done and the clinical assessment of the individual patient has had to be relied upon in most cases. Similarly, although a small blood bank is kept in the hospital, operation sometimes had to be delayed until the patient's blood group was known and suitable blood made available.

TABLE I.—Cases of Prostatic Disease, With Mortality Rate and Average Age

	All Cases		Fatal Cases	
	No.	Average Age	No.	Average Age
With retention ..	140	71.7 years	27 (19.3%)	78.8 years
Without ,, ..	57	69.0 ,,	1 (1.8%)	73 ,,
Total ..	197	70.9 ,,	28 (14.2%)	78.6 ,,

The main drawback was the delay in the receipt of the results of the sensitivity of the infecting organisms to the various antibiotics in the obviously infected cases.

Retention of Urine

Table I shows that prostatectomy for prostatic lesions without retention appears to be a safe operation, and the following discussion is mainly concerned with those cases in which retention of urine was the presenting symptom. These number 140 and do not include several cases of retention after over-indulgence in alcohol where normal micturition returned after a single catheterization and a long sleep. Nor do they include cases of retention due to stricture or neurological lesions. They may be divided into acute and chronic. Acute retention is here defined as retention of urine with a painful, tender, enlarged bladder. Chronic retention is reserved for those cases with a non-painful, distended bladder and uncontrollable dribbling incontinence which had been present for some time—often for weeks. The fact that 18 (12.9%) of the cases were chronic retention (Table II) again shows the delay in seeking medical advice in this series, especially as the man with a large residual urine but no incontinence is not included in the chronic-retention group.

TABLE II.—Mortality Rate With Various Types of Treatment

	Acute Retention		Chronic Retention		Interim Prostatectomy	
	Total	Deaths	Total	Deaths	Total	Deaths
Total	122	22	18	5	57	1
Catheter drainage only	2	2	1	1	—	—
Suprapubic cystostomy only	4	3	—	—	—	—
Prostatectomy ..	116	17	17	4	57	1
Retropubic prostatectomy ..	76	10	11	2	40	1
Transvesical one-stage prostatectomy	23	2	5	2	17	—
Fryer two-stage prostatectomy	17	5	1	—	—	—

Mortality for retention of urine, 19.3%. Mortality for prostatectomy for retention, 15.8%. Mortality for prostatectomy (all cases), 11.6%. Mortality for prostatectomy without retention, 1.8%.

Initial Treatment

Immediate prostatectomy as the treatment of choice has not been the practice in this hospital's series. The difficulties of staffing—medical, theatre, and nursing—and the absence of laboratory services preclude this. Also, many of the cases in this series fell into the groups III and IV of Wilson Hey (1945) and even in his hands had a mortality of 16% and 66%.

The initial treatment of the case with retention of urine depended on the initial clinical assessment, and four main groups are easily recognized.

1. *The healthy old man with no gross cardiovascular lesion.*—In these cases catheter drainage was instituted, followed by prostatectomy in two to four days. If catheterization was not possible (a not uncommon sequel of repeated catheterization outside hospital) drainage was done by means of a Riches suprapubic tube. The delay before operation may be criticized, but was necessary to confirm the clinical assessment, to check on renal function in doubtful cases, and to arrange for blood for transfusion if necessary.

2. *The patient with some other lesion who was thought unfit for early operation but thought to be capable of being made fit for operation in 10–14 days.*—Included were cases showing moderate hypertension and a history of old cerebral

lesions, cardiac irregularities without failure, severe bronchitics, obvious cases of anaemia, and cases with mild uraemic symptoms. In this type of case a Riches suprapubic tube was inserted or, under local anaesthesia, a small-bore de Pezzer catheter was introduced suprapubically.

3. *The very ill man who was going to require a long period of medical treatment before he was even "fairly fit" for surgery.*—In this group, which comprised cases of cardiac failure, recent hemiplegia, and renal failure, a suprapubic drainage was done under local anaesthesia—sometimes after preliminary catheter drainage.

4. *The moribund.*—In these cases a catheter was passed and tied in. Sometimes the apparently hopeless case improved and moved into the third group.

The initial treatment did not differ in the acute and the chronic retention except that in the latter even more care was paid to slow decompression.

Definitive Treatment

Table II lists the treatment and types of operation performed. Cases in group 1 above were treated by retropubic prostatectomy or by transvesical prostatectomy if cystoscopy revealed an intravesical lesion—diverticulum, neoplasm, or stone. Group 2 cases were treated by the retropubic approach in some but usually by a transvesical operation with closure of the bladder (Harris). If cases in groups 3 and 4 responded to treatment the prostate was removed by blind enucleation through the suprapubic wound. Transurethral prostatectomy was not used.

It will be seen that seven patients did not have a prostatectomy and six of them died. Of the three who did not have an operation, one who had been transferred from the medical ward where he had been treated for cardiac failure died during the induction of the anaesthetic; the second had a carcinoma of the recto-sigmoid and refused operative treatment; and the third died a few hours after admission.

Four patients had only a suprapubic cystostomy and three of these died in hospital. The fourth refused further treatment and died nearly four months later, at home, from renal failure, probably due to ascending infection. Of the three who died in hospital, two were transfers from the medical wards who had developed retention while under treatment for cardiac failure, and the third had a recent hemiplegia due to cerebral thrombosis. One died the day of operation, the others died two and seven days later.

On the remaining 133 patients a prostatectomy was done with 21 (15.8%) deaths. The mortality after retropubic or transvesical one-stage operation was roughly the same, but was higher after the two-stage Freyer operation. This is to be expected, as more poor-risk cases are included.

Similarly, the period in hospital (Table III) was longer after the two-stage operation than after a retropubic or closed transvesical operation, but the post-operative stay in hospital did not materially differ in

TABLE III.—Duration of Hospital Stay (In Days)

	Pre-operative	Post-operative	Total Stay*
Retention surviving prostatectomy ..	7.3	19.8 { R—17.1 T—22.3 F—28.9	28.1
Fatal cases ..	8.7	11.3	21.0
Interim prostatectomy ..	3.1	16.9	21.0

R=Retropubic prostatectomy. T=Transvesical one-stage prostatectomy. F=Frederick two-stage prostatectomy.

*Day of operation included.

the interim prostatectomy cases and those cases of retention surviving after one-stage prostatectomy. McEachern (1958) gives his average stay in hospital as 27 days, Bomford (1959) as 37 days, but Wells (1953) says "the ordinary good risk case is ready for discharge and fully ambulant in under 14 days." The average stay in hospital for cases submitted to prostatectomy in this series (excluding fatal cases) was 25.6 days.

Pathology

All specimens were examined microscopically, histological findings being shown in Table IV. Carcinomatous change was found in 26 out of 190 (13.7%)—a figure lower than that of Young (1945), who had

TABLE IV.—*Histological Findings and Mortality Rates*

	Retention		Without Retention		Total	
	Total	Deaths	Total	Deaths	Total	Deaths
Benign hyperplasia ..	100	16	47	1	147 (77.4%)	17 (11.6%)
Fibrosis ..	2	—	4	—	6 (3.2%)	—
Median bar						
Benign hyperplasia with abscess or severe infection ..	10	1	1	—	11 (5.7%)	1 (9.1%)
Carcinoma ..	21	4	5	—	26 (13.7%)	4 (15.4%)

21%, and of White and Berry (1950), who had 16%, but much higher than McEachern's (1958) figure of 7.6%. White and Berry (1950) suggest that 9 out of 10 carcinomas of prostate may be diagnosed by rectal examination. Only 4 of the 26 proved cases here were diagnosed, with confidence, before operation. Two of these (one without retention) were thought suitable for total prostatectomy. The other two cases had retention but did not respond to oestrogens and had a transvesical diathermy excision of the prostate. In many cases the histological diagnosis came as a complete surprise (the so-called occult carcinoma). In other cases the diagnosis was suspected before or confirmed at operation when difficulty in enucleation of a hard nodule or fixation of part of the prostate was found. Conversely, cases have been encountered where the findings at operation suggested malignancy but the pathologist reported only fibrous or inflammatory change.

All cases suspected before or at operation were started on oestrogens (castration was used rarely except in late relapses). "Occult" carcinoma was treated in the same way. The numbers are small but they do show a higher mortality in the malignant cases. The large number showing severe infection, usually with local abscesses (5.7%), may be due to the large number of cases which had been catheterized before admission or, possibly, to the delay between admission and prostatectomy.

Coexistent Lesions

Additional surgical conditions treated at the same time as the prostatectomy were: papilloma of bladder in two cases, diverticulum of bladder in six, stone in bladder in eight, and hernia in 12. The importance of immediate pre-operative cystoscopy is illustrated by the finding of two unsuspected papillomata in cases of acute retention. Similarly, the presence of diverticula can be confirmed and a decision reached on whether diverticulectomy should be done. The shallow diverticulum with a wide mouth need not be resected, but

the larger ones with narrow orifices must be removed if serious subsequent trouble is to be avoided. Small non-adherent diverticula can be removed by invagination and division of the neck, but larger ones, and especially where infection is present, are excised by a combined transvesical and extravesical approach (Badenoch, 1953). Six cases, all with more than one diverticulum, were thus dealt with in the series. One further example was missed (see below).

Stones in the bladder were found in eight cases—two of these also had stones in a diverticulum. One man who had lived for 13 years with a suprapubic tube which he changed himself had 97 stones in his bladder when he was at last persuaded to have a prostatectomy. Despite a long and stormy convalescence and the development of an incisional hernia, he now comes into the category "very grateful patient."

Many of these old men have inguinal herniae, and, unless the general condition is very poor, it is my custom to treat the hernia at the same operation. This was done in 12 out of the 190 cases (two were bilateral) without any ill effects. The cord was divided in all cases and the canal closed. The operation can be done easily by a short extension of the transverse incision now used as a routine for one-stage prostatectomy. In addition to the 12 cases with inguinal hernia, one case had an irreducible femoral hernia which was dealt with through a separate incision.

Post-operative Complications

Of the 168 patients surviving after prostatectomy, 32 (19%) had one or more of the post-operative complications listed in Table V, but in no case did death result from the complication. Of these complications, stricture of the urethra was the commonest (7.1%). Eight of these were post-meatal strictures, three were posterior strictures, and one occurred in the penile

TABLE V.—*Post-operative Complications (Surviving Cases)*

Stricture	Post-meatal ..	8 (4.8%)	Incontinence ..	4 (2.4%)
	Other ..	4 (2.4%)	Incisional hernia ..	10 (6.0%)
Epididymitis ..	..	8 (4.8%)	Stone in bladder ..	3 (1.8%)
Osteitis pubis ..	..	3 (1.8%)	Bladder diverticulum	1

urethra. Johnston (1953) found a 20% incidence of post-meatal stricture. Ross and Tinckler (1959) had only two cases in 100 consecutive prostatectomies. They attributed the lowered incidence to the avoidance of red rubber catheters, and my experience agrees with this supposition, as only one case has been encountered in the last three years under review since a latex two-way catheter has been used post-operatively. Although relatively common, the post-meatal stricture is not a serious complication if recognized, and only two cases required more than two dilatations before permanent relief was obtained. This confirms McEachern's (1958) comment.

Stricture in other parts of the urethra is a more serious problem. The patient with the stricture in the penile urethra, the cause of which is not known, was cured by excision of the stricture and is now symptom-free, but the three patients with posterior strictures still attend at varying periods for dilatation. All three followed a two-stage prostatectomy.

About a year after the present series was started routine division of the vasa deferentia was discontinued because two successive cases developed epididymitis despite vasostomy. This policy persisted for only a few months, until Caine's (1954) paper was brought to my attention.

He reported epididymitis in 7% when the vasa were tied and in 25% when the operation was omitted. Thus the vast majority of the one-stage prostatectomies in this series had bilateral ligation and division of the vasa (the exact number cannot be given because all the operation records do not include sufficient detail). Ross and Tinckler (1959) also report a 7% incidence, which is higher than in the present series (4.8%), where three of the eight cases occurred after two-stage prostatectomy—division of the vasa was not done in conjunction with this type of operation. Included in the remaining five cases is one in which an abscess formed at the vasotomy operation scar without a true epididymitis occurring.

Ross and Tinckler (1959) had no case of osteitis pubis in 100 cases and Millin (1953) mentions only 13 in over 2,000 retropubic prostatectomies. There were three cases in the 190 prostatectomies under review, but two of these were not confirmed by radiological examination. In only one case was the pain severe and incapacitating, with x-ray evidence of bony disease. This followed a retropubic prostatectomy for acute retention, and it was six months before the patient was symptom-free.

Although not usually mentioned in the textbooks, some degree of incontinence is not infrequent after all types of prostatectomy. Ross and Tinckler (1959) found a temporary incontinence in 25% of prostatectomies, more common in the older age-groups, and clearing "in the course of weeks." They had no case of permanent incontinence. When the four patients listed in Table V were seen at the follow-up clinic three months or more after operation they still had not regained full control. Many others had had some trouble in the first few weeks after discharge from hospital, but, when seen, had returned to normal. Two of the cases of incontinence followed diathermy excision for carcinoma of the prostate, one followed a two-stage prostatectomy, and the fourth, in which incontinence occurred only on coughing or straining, followed a "cold" retropubic prostatectomy. The two patients with carcinoma died within a year of operation but were maintained in a fair degree of comfort by the use of Paul's tubing and a urinal. The "stress" incontinence patient refuses any appliance, and the fourth patient, a feeble old man in the middle eighties, used a penile clamp until his death from cerebral thrombosis 18 months after operation.

The above complications occurred soon after prostatectomy. Late complications due to the operation consisted of persistent or recurring attacks of frequency with pain or the development of an incisional hernia. In three of the cases of recurring cystitis a stone was found in the bladder: two of these followed a two-stage prostatectomy. In the same period three other cases of bladder-stone after Freyer's prostatectomy, done in other hospitals, were seen. Three questions arise: Were these stones present when the initial operation (essentially a "blind" one) was done? Were they formed round a prostatic stone or loose tag from the prostatic fossa? Or, as seems more likely, was a nidus provided by blood clot and the inevitable infection which followed Freyer's prostatectomy? In all cases relief followed removal of the stone. In one case a persistent pyuria and intermittent breakdown of the suprapubic wound was found to be due to an overlooked bladder diverticulum. Its removal presented what Badenoch (1953) described as "a Herculean task,"

which fortunately was successful, but illustrated the importance of careful pre-operative examination. Only one case of incisional hernia has followed the use of a transverse incision for one-stage prostatectomy, which is now practised routinely but was used in only approximately 50% of the cases reviewed. Four cases followed retropubic prostatectomy using a midline incision and five followed a two-stage prostatectomy. Only three out of the 10 patients complained of discomfort, and their symptoms were relieved by a surgical support. In no case was operative repair advised.

It will be seen that, although nearly one in five cases had some complication, very few were seriously incommoded by the complication, and, excluding the cases of incontinence, were satisfactorily dealt with. It will also be seen that a large proportion of the complications followed the two-stage operation.

Causes of Death and Predisposing Factors

Post-mortem examinations were not made in any of the fatal cases, and the causes of death given in Table VI were based on the clinical findings. In one of the six fatal cases where prostatectomy was not carried out, the patient, as stated above, died from a carcinoma of the recto-sigmoid with secondaries in the lungs and is not included in Table VI.

TABLE VI.—*Causes of Death*

	Total	Post-prostatectomy
Cardiac failure or coronary thrombosis	10	7
Renal failure	5	5
Massive pulmonary embolus	2	2
Cerebral thrombosis	5	3
Cause unknown	5	5

Of the five other cases, treated by drainage only, three were cases with cardiac failure transferred from the medical ward, one was a hemiplegic also from the medical ward, and the fifth was an old man with a recent cerebral thrombosis who died a few hours after admission for treatment of his retention. Of the fatalities occurring after prostatectomy, cardiac disease was the commonest diagnosed cause. Four apparently fit men died from coronary thrombosis which was confirmed by E.C.G. Two others who had previously had a proved coronary thrombosis died with symptoms suggestive of further coronary infarction. One patient developed severe cardiac arrhythmia and, despite treatment, died of circulatory failure.

Renal failure as evidenced by oliguria, signs of uraemia, and a climbing blood urea was designated as the cause of death in only five cases, but it is felt that it was probably a major factor in the "cause unknown" group and a contributory factor in several other cases. Certainly many of the other cases showed some evidence of renal failure, usually with signs of severe infection. Pulmonary embolus and cerebral thrombosis as causes of death need not be enlarged upon—they are inevitable sequelae of operations on feeble and often inactive old men.

In those patients with retention on whom bladder drainage, by catheter or suprapubic cystostomy, was the only treatment, an obvious cause of death was present before the onset of retention. Similarly, 12 of those dying after prostatectomy had had previous severe cardiovascular lesions (necessitating hospital treatment in six cases) and four of these also had a chronic respiratory infection (Table VII). They were

cases where a major operation was accepted as a calculated risk and a fatal outcome was not unexpected by patient, doctor, or relatives. However, perusal of the case histories provides no evidence of any serious previous disease necessitating treatment in hospital or by their own doctor in 10 cases. Although most of

TABLE VII.—*Previous History of Those Who Died After Prostatectomy*

	Total	Transferred from or Previously Treated in Medical Ward
Severe cardiac lesions ..	9	5
Hemiplegia ..	3	1
Severe bronchitis ..	4	2
Nothing of note ..	10	—

them had some degree of arteriosclerosis they were apparently fit men who were "killed by the operation." As stated above, four of these deaths resulted from coronary thrombosis, but it is interesting to note that, of the other six, four died of renal failure and two from "causes unknown." Furthermore, although 44% of all the cases admitted with retention had been catheterized before admission, 17 (81%) of the 21 deaths after prostatectomy for retention had previously been catheterized (often repeatedly), including this particular group of six.

Summary and Conclusions

A review is presented of 197 cases of prostatic disease admitted to the surgical wards of a small provincial hospital over the five-year period 1955-9, with, in particular, a consideration of the fatalities.

Prostatectomy for prostatic disease without retention has a low mortality, and earlier operation for milder degrees of prostatism, before the serious consequences of the disease are manifest, would seem to be the only way to reduce materially the overall mortality.

Too many cases of prostatic disease to-day present with retention, and although a two-stage operation is often the best treatment for these cases this method carries a higher mortality and morbidity rate than does the one-stage prostatectomy. More cases would be fit for one-stage prostatectomy if referred to hospital sooner than is the custom now.

Any operative procedure in the older patient must entail risk, and if, as a general principle, surgical treatment aims at a return to normal physiological function as opposed to merely preserving life, then additional risk and a higher mortality must be accepted—not only by the patient (who is usually only too willing to accept the risk) but also by the surgeon. Having accepted this calculated risk any method of reducing it must be searched for, and study of the cases in this series suggests two possible approaches. Firstly, the education of the public and the general practitioner regarding the dangers of the use of a catheter except in a hospital theatre. Secondly, the organization of the hospital services so that these cases can be dealt with as emergencies with bacteriologist, biochemist, etc., available as easily as is surgeon, physician, and anaesthetist.

In essence, this paper is a plea for the establishment of a specialized urological service. Although it is realized that general surgeons, such as myself, will miss the joy of having the survivor telling him that "I feel 20 years younger," there would be more survivors if these cases were treated in the equivalent of the teaching hospital of Lee *et al.* (1957).

It is a pleasure to thank Dr. E. L. Wilson, my medical colleague, for his invaluable help in many of these cases; also Dr. J. E. Morison for his guidance in the pathological reports; and Sister Martin and her nurses, whose care has often meant the difference between success and failure. I am indebted to a succession of house-surgeons (now scattered all over the world) on whom so much of the post-operative care devolved, especially the enthusiastic young lady house-surgeon who counted the 97 stones in the bladder. My registrar during this period, Dr. R. Stinson, has been a most helpful assistant and has had most of the responsibility for the day-to-day treatment. Finally, I wish to thank my secretary, Miss M. Acheson, for her assistance in collecting the records necessary for the production of this review.

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URINARY INFECTION IN CYSTOSCOPY

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There is a good deal of evidence that one of the major factors in the aetiology of infections of the urinary tract is urethral instrumentation (Beeson, 1955-6). Gillespie *et al.* (1960) have shown the part played by catheterization and instrumentation in the production of urinary infections after prostatectomy. They have clearly indicated that by the proper sterilization of cystoscopes and the adoption of a closed system of catheter drainage the incidence of post-prostatectomy infections fell from 80% to 6%. Marple (1941) and Slade and Linton (1960) have investigated the role of catheterization in female patients in producing urinary infections; and Slade and Linton advocate that specimens of urine from female patients should be obtained by collecting a mid-stream specimen and not by catheterization.

It was the purpose of this investigation to determine to what extent routine cystoscopic examination, which is so often performed as an out-patient procedure, resulted in urinary infections.

Methods

The study was performed on a consecutive series of male patients who underwent a cystoscopic examination in the urological out-patient department of the London Hospital. The majority of them had been treated previously for a papilloma of the bladder and attended for follow-up examinations. Their ages varied from 33 to 75.

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