FACTORS RESPONSIBLE FOR THE LOWER MORTALITY IN PROSTATIC SURGERY

W. J. ENGEL, M.D.

That the mortality in prostatic surgery has been reduced sharply in recent years has been repeatedly demonstrated by the published statistics of various clinics, and we have shared in this experience. The advent of transurethral resection marked the turning point. In reviewing our statistics, the average mortality over a period of years prior to resection was 8.9 per cent whereas, in a like period since resection, the average mortality has been 1.8 per cent. Although resection is unquestionably the largest single factor responsible for this favorable trend, I feel there are other factors which should be given due credit in the consideration of this subject, which may be discussed under the following headings:

1. Earlier diagnosis and acceptance of treatment.
2. Preoperative preparation.
3. The operation itself.
4. Postoperative care.

EARLIER DIAGNOSIS AND ACCEPTANCE OF TREATMENT

In recent years, I have been impressed with the fact that we are seeing patients with bladder neck obstruction earlier in the course of the disease. More patients are coming in immediately following their first attack of urinary retention, and many are presenting themselves for relief of symptoms of urinary obstruction before they have progressed to the stage of complete urinary retention. I believe this is attributable in the main to two factors. First, the general physician is to be congratulated for recognizing symptoms of bladder neck obstruction earlier and advising corrective surgery. As a result, the layman has gradually learned that obstructive urinary symptoms are not just a necessary torment of old age, but the manifestation of a disease that may be remedied. Second, there can be little doubt that in the patient's mind, fear of operation, in years past, has been the greatest deterrent to accepting early operation. Today, however, the layman himself has become aware of the greater safety in prostatic surgery, and this confidence prompts him to seek operative relief at an earlier date. Gone is the treacherous hatband catheter and rare indeed is the patient who practices self-catheterization in preference to operation.

As a direct result of this earlier acceptance of operation for bladder neck obstruction, we are naturally operating upon better risk patients and fewer with advanced renal damage from prolonged back pressure. An important corollary to early treatment is the fact that the glands are smaller and are, therefore, more suitable to relief by transurethral resection, so that in the past several years I have found that approxi-

mately 90 per cent of the cases can be relieved by resection while only 10 per cent are of such large size that prostatectomy is necessary. Of especial interest to me is the fact that the patient's confidence in all prostatic surgery has been increased and they accept advice for prostatectomy as readily as for resection.

Preoperative Preparation

Certain essentials in the preoperative study of the prostatic patient, such as adequate blood chemistry studies and renal function tests, have long been known and so firmly established that they merely need to be mentioned here. If renal function is impaired, corrective measures must be instituted before operation can be carried out safely. More recently, however, we have learned to depend upon intravenous urography for guidance, not only as to the functional capacity of the kidneys, but also as an aid in prognosing the surgical convalescence. In general, it may be said that prompt function and a normal delineation of the upper urinary tract encourages one to predict an uneventful outcome, while delayed function with bilateral dilatation of ureters and kidney pelves is a warning that the patient requires deliberate and careful preoperative preparation if he is to be carried safely through the operation.

In 1939[1] I called attention to the preoperative prostatic mortality and showed at that time that a significant number of patients died during the course of preoperative preparation and that by revising the preoperative management, we were able to sharply reduce the number of preoperative deaths and indirectly to influence favorably the mortality following surgical operation. At that time attention was drawn to the dangers associated with urethral instrumentation in prostatics, particularly undue urethral trauma at the moment of first urinary retention, the inlying urethral catheter, and also diagnostic cystoscopy. The danger lies in the increased susceptibility of the obstructed urinary tract to infection which may be initiated in one of these ways.

Certainly, one cannot overemphasize the importance of the first contact with the patient who has acute urinary retention, for it may be the first chapter of a story with a happy ending or the beginning of a tragedy. The one great watchword should be gentleness which must be combined with an adequate instrumentarium and a scrupulous aseptic technic. Attention to these details, which must be observed especially by the general physician, can be one of the greatest factors in reducing the prostatic mortality still further. In this connection it seems well to discourage the use of the rigid metal catheter as it is an instrument of extreme danger. If a soft rubber catheter will not pass, it is much wiser to employ a semirigid silk woven instrument and to remember that no instrument should be forced—merely passed.

The value of adequate preoperative drainage in increasing the safety of prostatic surgery has, of course, long been recognized, and the use of the inlying catheter for this purpose is rather firmly intrenched in the mind of the physician. We, however, have convinced ourselves that this method of preoperative drainage possesses a hazard which can be avoided. It not infrequently is responsible for setting up urinary infection which, even if the patient recovers, is very debilitating; but worse, may even prove fatal. Our experience justifies the conclusion that the avoidance of the inlying catheter has been a large factor in increasing the safety of prostatic surgery. As a substitute, we prefer intermittent catheterization, or if more prolonged and continuous drainage seems necessary, suprapubic puncture is done, the technic of which was described in the article previously referred to.[1]

In summarizing our present method of preoperative preparation, which we believe has been of importance in reducing the prostatic mortality, the patients may be divided into four groups.

The first group includes patients in whom no inlying catheter and no other type of catheterization is employed. This includes those who present themselves with definite symptoms of obstruction but who never have had complete urinary retention. In such cases where the residual urine is not large and the renal function is satisfactory, as measured by urea clearance, other kidney function tests, or intravenous urogram, preliminary catheter drainage is not required and operation may be carried out safely the day after entrance into the hospital.

In group two are those patients who are prepared by intermittent catheterization. This group includes the patients with recent, acute retention in whom we prefer to carry out intermittent catheterization, this being done every six or eight hours or more often if the case demands.

The third group is comprised of those who present themselves with chronically overdistended bladders and with rather severely impaired renal function, in which we feel that a prolonged period of drainage is necessary. Suprapubic puncture has been more preferable in this group of cases.

In the fourth group is a very small number in which the inlying catheter is still employed, and ordinarily constitutes only those patients who are sent to us wearing inlying catheters, together with the rare patient with a severely infected and contracted bladder in whom suprapubic puncture cannot be done.

We have been impressed with the fact that preoperative management of patients according to this plan has markedly reduced the preoperative mortality and has certainly resulted in a smoother postoperative convalescence and a lower operative mortality. The risk of infection from wearing the inlying catheter condemns its use and undoubtedly its elimination has distinctly reduced the mortality in prostatic surgery.

In order to evaluate the success of this method of preoperative management, I recently reviewed one hundred consecutive cases managed by this plan. The ages of this group of patients are shown in Table 1, from

TABLE 1

SUMMARY OF 100 CONSECUTIVE OPERATIONS ON THE PROSTATE

Age of Patients	
50-59	12
60-69	39
70-79	41
80-89	8

which it will be seen that the usual age group of prostatics is included, the highest number occurring in the eighth decade.

Of this group of one hundred patients, ninety-two had transurethral resections and eight had suprapubic prostatectomies. No catheterization was done in twenty-six cases. The preoperative period was only one day in nineteen cases and two days in the remaining seven. The longest postoperative period was ten days while nineteen of the twenty-six cases were in the hospital seven days or less following operation, all cases having had prostatic resection. No operative deaths occurred in this group and no noteworthy complications were noted. The range of blood ureas is shown in Table 2, from which it is seen that only patients without significant urea retention are selected for this type of management.

TABLE 2

	No Catheter	*Intermittent catheterization*	*Suprapubic puncture*	*Inlying catheter*
Cases	26	53	16	5
UREA (mg. %)				
30-40	10	17	..	1
40-50	12	14	3	2
50-60	4	10	4	..
60-80	..	8	1	1
80-100	..	4	3	1
100-150	..	..	3	..
150-200	..	..	2	..

There were fifty-three patients who had intermittent catheterization. We believe this is less likely to be followed by urinary infection, particularly if done at regular intervals without allowing the bladder to become overdistended. Of this group, five had prostatectomies and the remaining forty-eight had resections. Twenty-seven cases or 51 per cent spent only one or two days in the hospital before operation and in the remaining twenty-six the preoperative period ranged from three to seven days, the higher ureas requiring the longer periods of preoperative preparation.

Suprapubic puncture was carried out in sixteen of the hundred cases. When first seen the majority of these patients had large, palpably distended bladders reaching almost to the umbilicus. It is particularly this type in which we advocate suprapubic puncture as a means of avoiding infection which plays such havoc, once introduced. As will be seen in the table, the higher blood ureas occurred in this group and therefore a longer period of preoperative drainage was required. In fact, six of the sixteen patients were sent home wearing a suprapubic catheter for a period of from three weeks to two months, and we encourage all patients to do so in whom we believe a long period of drainage is essential. The remaining ten patients in this group were operated upon after seven to fourteen days of drainage. Fourteen patients had resections and two had prostatectomies.

There were only five patients in whom an inlying catheter was used and in every instance it had been inserted elsewhere. Resection was performed in four of these and prostatectomy in one, and all recovered satisfactorily.

We feel that this plan of preoperative preparation has been one of the most important factors, not only in reducing the preoperative prostatic mortality, but also in reducing the operative mortality.

The Operation Itself

As has already been stated, there can be little question that transurethral resection has been the greatest single factor in reducing the operative mortality in prostatic hypertrophy. It is true, of course, that the mortality statistics of this operation will depend to a large extent upon the experience of the surgeon and it is equally true that as experience has increased, the safety of the operation has also increased, as has also the completeness of the resection. Contributing to the greater safety of prostatic resection is the fact that the confinement to bed is shortened tremendously. Most patients having this operation spend only two to three days in bed, as it has always been our practice to allow patients up just as soon as the urethral catheter is removed. Another factor undoubtedly contributing to the safety is the improvement in methods of anesthesia, and it is my own personal belief that spinal anesthesia has

contributed greatly to the safety of operation. We have found that otherwise bad risk patients with cardiovascular disease and other associated complicating conditions tolerate spinal anesthesia exceptionally well, and I am convinced that there is less hazard in this than in inhalation anesthesia, or anesthetics of other types.

One of the early hazards of transurethral resection, namely hemorrhage, has been almost entirely eliminated and in the present day of resection it is rare indeed to see a patient in whom hemorrhage constitutes any threat to recovery. This, of course, is due in large part to improved cutting and coagulating currents, but its incidence diminishes as the experience of the surgeon increases.

I have previously indicated that there is approximately 10 per cent of patients in whom we feel that prostatectomy is still the operation of choice. It has been interesting to observe, however, that the mortality from prostatectomy has also diminished and this, I feel, is indirectly due to resection. This apparently contradictory statement is explainable because of the fact that since the advent of transurethral resection, we may be much more selective in patients for whom we advise prostatectomy, choosing only the better risk patients with a large gland. In such cases, we have been able in every instance to perform a one-stage suprapubic prostatectomy, and since 1933 there have been under my care thirty-four prostatectomies without a death. Although suprapubic prostatectomy has been our preference, those who advocate perineal prostatectomy likewise have reported a diminishing mortality rate.

It is thus seen that, irrespective of the type of operation selected for the patient, the lower mortality obtains.

Postoperative Care

In consideration of postoperative care, the question arises as to what is the common cause of postoperative deaths which have occurred following prostatic surgery. I should like to consider first the postoperative deaths following prostatic resection. In reviewing the operative deaths from resection, the one fact that stood out was that 56.2 per cent were due to postoperative urinary sepsis with resultant uremia. This fatal complication has been largely controlled by two measures, (1) the institution of a closed system of postoperative irrigation and (2) by the use of the newer chemotherapeutic agents. In crediting closed irrigation one needs only to observe the striking reduction in this complication following its institution some years ago. Whereas urinary sepsis was a relatively common postoperative complication before the adoption of closed irrigation, this complication now is exceedingly rare and when it does occur, it is ordinarily mild and easily controlled with one of the newer chemotherapeutic agents, particularly sulfanilamide and sulfapyridine.

Another important measure in postoperative care to which we attach significance is the early removal of the inlying catheter. The catheter should be removed just as soon as all risk of hemorrhage is passed, which, in many cases, is at the end of twenty-four hours and never later than forty-eight hours. The same objection to the preoperative use of the inlying catheter holds for its postoperative employment, and to leave it in beyond forty-eight hours is to invite trouble. Its early removal not only tends to reduce the risk of postoperative urinary sepsis, but also sharply reduces the incidence of epididymitis and other complications, and enhances the comfort of the patient. If the resection has been adequate, we feel there is no need to leave the catheter in beyond the time the danger of bleeding is passed, and its early removal avoids many difficulties. As previously stated, we insist upon the patient getting out of bed as soon as the catheter is removed and this early increase of normal activity lessens the chance of pulmonary complications.

In considering the postoperative care of the patient who has had a prostatectomy, there have been no significant changes in the routine which has been employed for a long period of time. Because continuous through and through irrigation may be carried out, the danger of urinary sepsis is not so great as following prostatic resection. The usual causes of death following prostatectomy have been, in the past, shock, circulatory failure, renal failure and pneumonia. These have been largely removed because we are now able to select better risks for this operation.

In summary, we believe that today there is a changed outlook for the prostatic patient who faces operation, and he can contemplate it with much less fear. Whether or not the ultimate in safety of this operation has been reached is difficult to say, although it must be admitted that there must be some end-point. Where one is carrying out a surgical procedure on patients in this age group, it would seem that a certain mortality is inevitable, but it should be our constant aim to seek improvement until this mortality has reached its lowest possible level.

Reference

Engel, W. J.: Preoperative prostatic mortality, J. Urol. 41:505-514, (April) 1939.