An Address

ON

THE PART OF THE PRACTITIONER IN THE
TREATMENT OF THE PRE-OPERATIVE
STAGE OF ENLARGED PROSTATE.*

BY

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In surgery it is always easy to be wise after the event. Prostatic surgery supplies us with many examples of this truth, and anyone who thinks out the cause of post-operative disappointments and failures must at times regret that more care was not taken in pre-operative treatment.

The greater the experience I gain in prostatectomy the more I am impressed by the fact that many of the complications of prostatectomy are preventable by pre-operative treatment. There are complications against which no provision can give immunity. We cannot, for instance, avoid the occurrence of pulmonary embolism in a practically clean case. We cannot avoid cardiac failure which occurs days or weeks after the operation, or renal failure where the kidneys have been destroyed beyond the point of recovery. But we can prevent or modify some of the bowel complications or kidney complications and some of the other complications by careful pre-operative examination and preliminary treatment. And it is along these lines that the practitioner can do so much to help in reducing the mortality of prostatic enlargement.

The risks to which a patient suffering from enlarged prostate, whether he be submitted to operation or treated without operation, is exposed, are not confined entirely to the urinary organs. They may be arranged for discussion under different systems:

1. Gastro-intestinal risks.
2. Pulmonary risks.
3. Circulatory risks.
4. Nervous system risks.
5. Urinary risks.

GASTRO-INTESTINAL RISKS.

I will first relate a case of gastro-intestinal complication following operation, and then discuss the subject.

A. S. B., aged 60, complained of frequent micturition and neuritis of the right arm. He was known to have a high blood pressure (180), and had had his teeth removed as a possible source of infection for his neuritis. There had been several attacks of retention of urine during the past two years.

He was a stout, short-necked man with a predominant abdomen. The frequency of micturition amounted to twenty minutes during the day and five or six times at night. There was urgency, hesitation at the commencement and difficulty in the act. The urine was clear, and there was about one ounce of residual urine. The urine contained only 1 per cent. of urea, but the quantity was normal. The prostate was large, elastic, movable and prominent in the rectum. The kidneys were not palpable or tender. He showed no clinical signs of uraemia. His appetite was large, and there was a tendency to constipation. Flatulent distension of the abdomen was common after meals. Apart from the enlarged prostate, bowel distension, the high blood pressure and the low urea content of the urine, nothing abnormal was discovered by two physicians at different dates.

I was uneasy about the bowel, and declined to operate until he had undergone some treatment for the flatulent distension. He improved on bowel antiseptics, but pituitary gland did not suit him. After a month I saw him again and consented to operate, although I expressed some anxiety in regard to his bowel.

On June 10th, 1920, an adenomatous prostate weighing 56 grams was removed under spinal anaesthesia with a minimal amount of general anaesthetic. Haemorrhage was very moderate, and there was no shock. Post-anaesthetic vomiting was moderate on the day of the operation, and had ceased next day. On June 11th the condition was good and much flatus was passed. The temperature was 99°. There was free drainage, the urine being stained with blood. During the day he complained of flatulence; pituitrin (3 c.cm.) gave much relief, and flatus was passed freely.

During the night June 11th-12th flatulence was very troublesome, but was relieved by the rectal tube. The temperature was 99° and the pulse 80. The complaint of flatulence continued on June 12th and 13th, but on the 14th it had disappeared and on this day the bowels moved three times after an aperient.

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On June 20th he was given some indigestible food by his relations. This was followed by vomiting and abdominal distension. These symptoms continued and now dominated the clinical picture. Urine was being secreted in good quantity. On June 20th he was seen by a physician, who diagnosed intestinal obstruction, and a general surgeon was called in consultation. The surgeon, however, agreed with me that there was no obstruction or peritonitis. Vomiting continued. The stomach was washed out, with some relief.

During the next ten days the distension varied; sometimes the abdomen was tense and at other times it was fairly soft. The bowels were opened by enemata with varying results, the motions being always very offensive.

On June 26th, 27th, and 29th the temperature rose to 100° and 101°. The quantity of urine, so far as could be measured, diminished slightly, but it was 37 oz. on the 28th and 38 oz. on the 29th.

On June 25th the blood urea was examined and found to be greatly increased (370 mg. in 100 c.cm.). There were no symptoms pointing to uraemia on June 27th, but next day there was some drowsiness and a good deal of wandering. On this day (June 28th) signs of cardiac failure appeared and became increasingly evident, and recurred during June 29th, and he died on June 30th.

I have quoted this case at length as it is a good example of the type of bowel complication that is likely to be met with after prostatectomy. In this case there was an element of uraemia (due to chronic interstitial nephritis), which is absent from most of the cases I have seen.

Post-operative distension of the bowel may occur in all degrees of severity, from a slight flatulent distension with difficulty in getting the bowels moved for a few days after the operation to a prolonged distension of the bowel ending fatally from pressure on the diaphragm and interference with the heart's action. Rarely, it occurs as a very acute condition and is rapidly fatal.

One of the most striking cases I have seen occurred in a man of 60 of the same type as the last, in whom I removed the prostate and a bladder growth. He made good progress until the fourth day, when he suddenly had pain in the epigastrium; the abdomen became acutely distended and the distension continued for two hours, when he died of cardiac failure. I have not seen another case so acute.

This post-operative distension in urinary surgery is not confined to prostatic and bladder cases. I have seen a similar condition which ended fatally after an operation for stone in the kidney, and distension of the colon is not uncommon during the first few days after kidney operations. It is seldom, however, that it is so serious as that following prostatectomy. I have seen it also in a case of septic stone in the kidney where no operation was performed.

In looking for a cause for the condition we must remember that in kidney operations the colon is stripped from its attachment to the kidney and below this, and there is sometimes a good deal of trouble in separating adhesions at the extraperitoneal aspect of the colon. When we remember also that in septic kidney conditions perinephritis is constantly present, and that this must involve the contiguous wall of the colon, there is no difficulty in recognizing that a local paralysis of the colon is likely to occur leading to distension with flatus which spreads to other parts of the colon.

In prostatic cases so simple an explanation is not possible. In most of those I have seen the colon is distended, and constipation and hiccup are frequent, but in some cases the stomach is the organ affected, and the distension affects the upper part of the abdomen; in these constant vomiting of coffee-ground material is usually a symptom, and a large quantity of this fluid may be removed with the stomach tube.

Most of these cases are cases of enlarged prostate with back pressure on the kidneys, and in some of them, such as that which I have described, uraemic symptoms actually appear. It is likely, therefore, that uraemia may have something to do with causing the condition. But there are cases that occur in younger men without sepsis or back pressure, and, further, the symptoms and proof of renal inadequacy is absent in most of the cases.

Two elements, I believe, enter into the causation. One is flatulent distension of the bowel from intestinal fermentation, and the other is exhaustion of the sympathetic nervous system as a result of uraemia, intestinal toxæmia, or shock.

Recently it has been suggested that post-operative dilatation of the stomach is due to dragging on the

mesentery by the small intestine dropping into the pelvis after the removal of large pelvic tumours (Borchgrevink).

Having recognized that such a condition may complicate prostatectomy, is it possible to foretell its occurrence and do something to prevent it? It is, I believe, possible to do so.

There are two different types of patient that are liable to this condition—a thin type and a stout type. Imagine a thin man of 60 with a sallow complexion. He complains of prostatic symptoms; the prostate is enlarged, and there is a varying amount of residual urine. Further investigation shows that he suffers from flatulent indigestion after meals, and has to be careful about his diet; his teeth are probably decayed and there is pyorrhoea; the tongue is coated. The abdominal wall is thin, and should lend itself to easy palpation but that the bowel is full of gas, the percussion note tympanitic, and abdominal palpation is difficult. The other type is a stout, flabby man of 50 or 60, often of the Jewish race. He is fond of rich fatty foods, and is immoderate in his indulgence in them. The abdomen is prominent, rounded, and tense; there is no pyorrhoea or decayed teeth. When you meet with an enlarged prostate with either of these types you may expect post-operative trouble from the bowel.

How can we prevent this complication and how treat it when it occurs?

In all such patients I recommend a course of four or five weeks' bowel treatment after the teeth have been carefully overhauled. This question of teeth is very important; it affects not only the bowel risks, but also the pulmonary risk. Oral sepsis is the cause in some degree, if not wholly, of the flatulent dyspepsia of the first type of case. It may take five or six weeks or even longer for the dentist to treat the oral sepsis, and there may be considerable difficulty in getting the patient to consent to the dental treatment, but the matter is so important that it is the duty of the doctor to insist on the mouth being clean before any operation is performed. Anaesthetists will, I think, support me when I complain of the condition of the mouth and teeth in many patients who come up for operation, not only in hospital but in private practice. I do not think that practitioners sufficiently appreciate the serious menace that such a condition is to a patient about to undergo an operation.

All these intestinal-risk patients, however, do not have decayed teeth and pyorrhoea and the second type very often have good teeth. The bowel itself must therefore be treated.

I do not presume to instruct such an assembly as this in the treatment of flatulent dyspepsia. Let me mention, however, the lines of treatment that have been most successful in the prostatic cases I have seen. They are the restriction of starchy foods and green vegetables in the diet, bowel antiseptic treatment, and bowel tonic treatment. A capsule containing β -naphthol 5 grains, salol 5 grains, and calomel $\frac{1}{2}$ grain has proved a good combination, and capsules of kerol (intestinal) are very valuable. At the same time the bowels must be regulated by vegetable aperients. I do not consider salts and aperient waters suitable for these cases, for they tend to cause distension of the bowel with gas. Tonic treatment of the bowel should be combined with those measures. Strychnine and ergot are the best drugs, and suprarenal and pituitary extracts act as powerful tonics of the bowel muscle.

Two other methods of treatment have been of much use in these cases—namely, abdominal massage and electrical treatment of the bowel. One would, of course, not think of employing either of these methods where the bladder is known to be distended with residual urine.

Now let us turn to the post-operative treatment. In the average patient the immediate preparation of the bowel for operation consists in giving a dose of castor oil two nights before the operation and washing out the colon on the morning of the operation. After the operation the bowel is left quiet for three or four days, and then a dose of castor oil is given. This is done in order to avoid straining after the operation, which sometimes causes bleeding.

If, after the operation, the patient commences to show distension of the abdomen or vomiting of dark coffee-ground material, a purge (castor oil) must be given at once.

In some cases the stomach is distended and there is

persistent vomiting. Here the stomach tube should be passed, and the stomach washed out. Sometimes large quantities of dark brown fluid are removed and the washing will have to be repeated.

Borchgrevink, who looks upon dilatation of the stomach after abdominal operations as due to dragging on the mesentery causing obstruction at the duodeno-jejunal junction, recommends the prone position and elevation of the pelvis; and operation has been recommended with the object of raising the intestines from the pelvis and relieving the drag on the mesentery, and also of removing adhesions. I have not met with a case of post-prostatectomy distension where this procedure held out any prospect of success.

The more common cases have distension of the colon and hiccup, but no vomiting. Pituitary gland is a good drug in these cases, but it should be given carefully on account of its effect on the blood pressure; $\frac{1}{4}$ c.cm. may be given at first and repeated in a few hours, and 1 c.cm. given daily. Ergot and strychnine may also be given.

A high rectal tube should be passed and the colon washed out and a tube left for several hours at a time in the rectum. When the patient is stout, he should be made to lie on his side instead of being propped up in a sitting position, as the passage of flatus is facilitated by this position. Various enemata are given—soap and water, ox-gall, turpentine. Care is necessary in giving enemata of turpentine in old feeble patients. In a hospital patient I once saw sloughing of the whole thickness of the rectal wall in a circular cuff following a large turpentine enema.

PULMONARY RISKS.

There are two pulmonary risks that should engage the attention of the practitioner before the operation. One is the possibility of post-operative pneumonia and the other is bronchitis.

Most cases of post-operative pneumonia that I have seen when the patient has not been exposed for a long period at the operation were due to septic teeth, or to some septic condition of the nasal sinuses. These sources of septic pneumonia should be most carefully treated before the operation of prostatectomy is undertaken. It is sometimes urged that the operation is urgent and must be done without delay. There is nothing to support this view. It may be, and often is, urgently necessary to drain the bladder on account of sepsis or obstruction, but this can be done under local anaesthesia and the prostatectomy deferred until the patient has got rid of the oral or nasal sepsis.

Chronic bronchitis requires careful pre-operative treatment. A patient with bronchitis after prostatectomy, or, indeed, after any abdominal operation, is in a very serious state. Coughing is very painful and difficult, and the patient is apt, even in the sitting posture, to become waterlogged from inability to expectorate. Pre-operative treatment may include courses of vaccine and even climatic treatment before the patient is fit for operation.

Chronic bronchitis is not infrequently combined with obesity and a fatty heart, and those patients are very grave risks for prostatectomy. Certain modifications of the operation should be made in order to lessen the risk in these patients. Spinal anaesthesia is used as an anaesthetic, the Trendelenburg position is avoided, and the patient is kept sitting up in bed after the operation.

I have tried prostatectomy under local anaesthesia in such cases, but have not been favourably impressed by the method. Cystotomy is easily carried out under local anaesthesia without the patient suffering pain or even discomfort, but I have found that even the most careful preparation of the bladder, urethra, and prostate with local anaesthetics is not sufficient to abolish the pain of enucleating the prostate, tearing across the urethra, and removing the gland from its bed.

Pronounced spinal curvature, whether due to old spinal caries or to other causes, is a grave pulmonary risk. One of the greatest risks I have taken, and one which I am glad to say was justified by success, was the case of a well known member of our profession who suffered from advanced osteitis deformans, and in whom the spinal curvature was so extreme that the ribs met the iliac crests on each side. The chest was rigid, and respiration was purely diaphragmatic. Yet he underwent a severe operation for growth of the bladder, and lived without recurrence for some years afterwards.

CIRCULATORY RISKS.

Circulatory risks are probably the most difficult of any to estimate where prostatectomy is proposed. There are some that are much reduced by careful treatment. Two of these deserve mention—namely, high blood pressure and cardiac insufficiency. With high blood pressure we expect post-operative haemorrhage. These patients usually stand haemorrhage very well, but a haemorrhage severe enough to cause a sudden drop of blood pressure may end fatally. Any hope of permanently reducing the blood pressure before operation is certain to lead to disappointment, but much can be done by rest, careful diet, removal of stimulants, and attention to the bowel, and a careful course of such treatment for a month before operation will well repay the time spent. I recently operated on a patient when the blood pressure was the most important factor in the case. The case was as follows:

A gentleman, aged 62, consulted me in October, 1920. He complained of frequent micturition night and day. There were recurrent attacks of difficult micturition, during which there was spasm of the bladder and severe straining. He had been catheterized, and this had been followed by a rise of temperature. The urine contained a small amount of mucus and very many micro-organisms. The blood pressure was 190 to 200 mm. Hg. In January, 1919, he had a slight attack of hemiplegia. The intensity of the spasmodic attacks suggested the possibility of some cord lesion.

He was a spare active man with a moderate enlargement of the prostate and no residual urine, suitable for prostatectomy, but with circulatory and nervous risks. Sir Thomas Horder examined him and reported that there were no signs of cord changes, but that definite traces of left hemiplegia still remained. The blood pressure was high, but Sir Thomas Horder agreed with me that there was a circulatory risk in not operating from the severe straining during the recurrent attacks of obstruction.

Operation was decided upon, and the following points were made in regard to the anaesthetic: Gas and oxygen and also ether were avoided on account of the effect on the blood pressure. The Trendelenburg position was precluded from the effect it would have on the cerebral circulation. The anaesthetic chosen was spinal anaesthesia with stavaine.

The operation passed off smoothly. There was one small haemorrhage after the operation, but it was easily controlled. The patient made a good recovery.

I have operated on patients suffering from the various forms of valvular disease of the heart, and also in a case of thoracic aneurysm, and have not had any trouble so long as compensation was good. If the patient can walk quickly and go upstairs without breathlessness, and can go about his ordinary duties without cardiac pain or other sign, there is apparently nothing in a valvular lesion to contraindicate prostatectomy.

When the blood pressure is high ether is better avoided, and in most cardiac lesions the Trendelenburg position should be avoided as far as possible. Spinal anaesthesia, with a very small amount of C.E. and oxygen, seem to suit these patients. In choosing the anaesthetic, the profound drop in the blood pressure, as the result of spinal anaesthesia, will of course be taken into consideration.

Anaemia is a further risk. The risk is partly operative and partly post-operative. These patients do not stand loss of blood at the time of the operation, and they are less likely to survive post-operative complications, such as bronchitis, bowel distension, exacerbation of pre-existing sepsis, etc. Moreover, they heal very badly. The wound fills with weak oedematous granulation. Closure of the bladder is delayed and a fistula may persist.

Brandsford-Lewis, in discussing the importance of anaemia in prostatectomy, states that haemoglobin, about 60 per cent., is favourable, 50 per cent. justifiable, 40 per cent. is unfavourable, and 30 per cent. fatal in prostatectomy. Without making any such hard-and-fast rule, I feel that there should be very careful consideration of this risk before operation, and that treatment should be directed to removing it.

Anaemia in these cases usually results from chronic sepsis, and the treatment must be directed primarily to removing this. In the great majority of cases the sepsis is in the urinary tract, and the patient is suffering from what is termed urinary septicaemia—a combination of uraemia from obstruction and toxæmia from chronic cystitis and pyelitis or pyelonephritis. In such cases the proper treatment is free drainage of the bladder by cystotomy. The removal of the prostate is postponed until the sepsis has cleared up and the haemoglobin content of the blood has improved. A two-stage operation is thus carried out.

Treatment of extra-urinary sources of sepsis should also be carried out. Alveolar abscesses, pyorrhoea, septic tonsils, sepsis of the accessory air passages, chronic appendicitis, cholecystitis, are some of these extra-urinary foci of sepsis that require treatment before prostatectomy is undertaken. Further, direct treatment of the anaemia should be undertaken. The question of transfusion of blood should, I think, be raised in these cases, and I am strongly of opinion that in selected cases this should be carried out before undertaking prostatectomy.

NERVOUS SYSTEM RISKS.

The question occasionally arises whether a patient suffering from tabes or multiple sclerosis should have an enlarged prostate removed.

The diagnosis is extremely difficult. There is an adenomatous enlargement of the prostate and signs of tabes. The point that at once arises is, what is the condition of the bladder wall? Is the residual urine that is present due to atony of the bladder wall or is it due to prostatic obstruction?

The following points are of importance in differentiating between nerve atony and obstruction. In atony of the bladder from nervous disease nocturnal incontinence is an early symptom. It appears sometimes before the other symptoms of nervous disease are noticed, and it should be a rule that whenever an adult male complains of nocturnal incontinence without other symptoms, tabes should be suspected, and a careful examination of the nervous system, including of course examination of the spinal fluid, made.

Incontinence of urine occurs, of course, in enlarged prostate, but not unless the bladder is distended and the leaking urine is an overflow. In tabes, on the other hand, incontinence occurs where only a few ounces of residual urine are present.

In enlarged prostate frequency of micturition is a prominent symptom, especially nocturnal frequency. This is often absent in tabes and there may be a lack of desire rather than increased frequency. Where cystitis is present, however, there will be frequent micturition in tabes.

The time of onset of bladder symptoms may have been before the prostatic age—namely, after 50 years.

On passing a catheter, the force of the stream through the catheter is much more powerful in enlarged prostate than it is in tabes.

Cystoscopy shows changes in the bladder in tabes that are quite typical of the "nerve bladder." The whole bladder wall is covered with thin, sharp trabeculae, crossing and recrossing each other, and between these are multitudes of sacculi. The trigone is not affected.

In the obstructed bladder the trabeculae are thick and fleshy, and sacculi only appear in the late stage, and are comparatively few in number. The trigone is involved in the trabeculation, and it may be difficult to recognize the interureteric bar and find the ureters. In multiple sclerosis the symptoms are those of a spasmodic bladder, and the diagnosis is more likely to be confused with cystitis. There is frequent micturition amounting to strangury, active incontinence at night, and sometimes also during the day, no residual urine, and the urine is clear.

When in a tabetic subject the residual urine is due to enlarged prostate prostatectomy will give a brilliant result. In such a case there is a danger of bedsores developing during convalescence, but this can be avoided by careful nursing. I have performed prostatectomy three times on patients the subject of advanced disease of the spinal cord—twice in tabes and once in multiple sclerosis—and in all with success, the vesical function being completely restored to its normal condition.

Another problem connected with the nervous system is operation on patients suffering from enlargement of the prostate who have had hemiplegia. This problem is connected also with the circulatory system, and I have discussed it under that system.

URINARY RISKS.

Of all the risks to which the sufferer from enlargement of the prostate is exposed, those connected with the urinary tract are the most common, and also the most frequently fatal. These risks are, however, the most amenable to pre-operative treatment. They are sepsis and renal inefficiency.

A very large number of the patients that come to the surgeon are already infected and are suffering from the effects of back pressure on the kidneys. They are passing through a danger period which may be of recent onset or may have existed for some months or even years. Operation on such patients frequently gives very brilliant results. Patients who are broken down in health, unable to attend to their business or social duties, may, after prostatectomy, make a striking recovery and return to their duties active and rejuvenated.

But there is another side to the picture. The mortality in such cases is high. Some of these patients die under treatment before an operation is performed, others die from the operation because it increases the septic absorption or overturns the already much disturbed balance of renal secretion, and others, again, while temporarily improved by operation, gradually go downhill from the continued sepsis and progressive renal failure. It may be said, therefore, of cases of enlarged prostate suffering from sepsis and renal failure that the condition of the patient is very grave and will eventually be fatal without operation, that the mortality of operation in such cases is high, and that the duration of life in most cases that survive operation is shortened.

Is it necessary that patients should be allowed to pass through this period of danger before being relieved by operation? I hold that it is not, and I think most surgeons who do much prostatic work will agree with me that operation should be performed early in order to avoid this period of danger and its after-effects.

The remedy lies almost solely in the hands of the general practitioners. If they bring the patient up for operation in the early stage, before the bladder has been infected by the catheter and before the kidneys have been injured by the continued back pressure, this danger period can be avoided. There are, of course, some patients who refuse to submit to operation until they are convinced by the sufferings entailed by catheter life that it is inevitable.

The result of the operation in an early case is not so striking as in a case where the patient has suffered from urinary septicaemia, but after operation his prospect of life is better than even the most brilliant case of recovery from urinary septicaemia.

The practitioner should be prepared to make a diagnosis of enlarged prostate before an attack of retention has occurred.

Frequency of micturition is usually the earliest symptom. It may be the only symptom even when the prostate has reached a considerable size. There is a curious belief prevalent among the male public that increased frequency of micturition and nocturnal frequency is a normal accompaniment of advancing years. Nothing could be more erroneous. The senile bladder is, if anything, less sensitive than the young bladder, and any persistent increase in the frequency of micturition, nocturnal or diurnal, is pathological, and requires careful investigation.

Rectal examination may disclose, even in the early stage of the symptoms, a large elastic prostate. On the other hand, there may be a doubt as to whether enlargement is present. In such a case we must remember that the prostate enlarges in two directions—namely, outside the bladder, extending backwards into the rectum, and upwards into the bladder. There may be intravesical enlargement with very little change that can be detected *per rectum*. The next step, therefore, is cystoscopy, and at the same time an estimate will be made of the residual urine.

Where difficult micturition is the chief symptom, the degree of obstruction varies with wide limits, and I can best discuss it by giving three types.

TYPE 1.—*The patient with chronic retention of urine and partial renal failure, or uraemia.*

The patient can pass water with a fair stream, but he has pronounced nocturnal frequency and sometimes nocturnal incontinence. He usually complains of headache and thirst, and sometimes the latter is a prominent symptom. The tongue is dry and glazed, the appetite poor, and the bowels constipated. The patient may be losing flesh, but he sometimes says he is getting stouter, the fact being that the distended bladder increases his girth. On examination there is a distended bladder reaching

almost to the umbilicus. On rectal examination the prostate is enlarged and elastic. There is no more dangerous class of case in urinary surgery than this. A careful survey of all the symptoms is called for in order to estimate fully the probable danger points under treatment.

Finally, the condition of the kidneys should be carefully investigated. I have already indicated the symptoms of renal failure or uraemia. One of the tests of the renal function should be added to make the picture complete.

The most easily applied of these tests is called the urea concentration (MacLean) or forced urea elimination test, and there is no reason why the test should not be used by every practitioner. A dose of 15 grams of urea is given by the mouth, and the patient at the same time directed to empty the bladder as far as he can. The urine passed in the first hour is collected as a specimen, and that passed in the second hour after administration of the urea is collected. The urea is quantitatively estimated by the ordinary method. The normal kidney will excrete 2 per cent. or over, a damaged kidney between 1 and 2 per cent., and a seriously damaged kidney under 1 per cent.

I will pass now to the treatment of such cases.

The two cardinal points in the management of such a case are to avoid infecting the bladder and to empty the bladder very slowly. A distended bladder is much more easily infected than a normal bladder, and the slightest mistake in technique will be followed by some cystitis, which in such cases quickly leads to ascending pyelonephritis and death. When there is chronic distension of the bladder the kidneys are working against very high pressure. If the bladder is rapidly emptied, the sudden fall of pressure leads to a rush of blood into the renal vessels and suppression of urine very often supervenes.

Such are the dangers. How can they be avoided?

In the first place, there must be no hurry to pass a catheter without adequate preparation. The condition has been going on for many months, if not for years, and a few days longer will make no material difference. Therefore, put the patient to bed, keep him warm, get the bowels well cleaned out, give him urotropin and as much fluid as he will drink.

After a few days, under the most rigid aseptic precautions, pass a coude catheter, No. 8 or 10, and tie it in the urethra. Withdraw 10 oz. and plug the catheter. Get the nurse, very carefully drilled in asepsis, to withdraw 10 oz. every hour until the bladder is empty. Now attach a small rubber tube to the catheter and allow the urine to drain away continuously into a bottle. All the time continue the urotropin and large quantities of fluid and keep his skin acting by a warm temperature and hot bottles.

The danger period lasts usually a week or ten days, and during that time continuous drainage of the bladder must be kept up. One or two tests of the renal function during this period will show the functional condition of the kidneys. The clinical symptoms are a very important indication also.

With improvement the thirst diminishes and is lost, the tongue becomes moist, the appetite improves, and the headache disappears. On the other hand, persistence or increase of these symptoms is a grave indication. To these may be added drowsiness during the day and wandering and restlessness at night. The patient tries to get out of bed.

At the end of ten days or a fortnight what is to be done? If the patient has improved under the drainage, and the renal symptoms have disappeared, operation may be undertaken. If the renal symptoms have continued and increased, the bladder should be drained suprapubically under local anaesthesia, or gas and oxygen, and the patient must wait until the renal function has improved before the prostate is removed. It is sometimes necessary to wait for many weeks or even months before the patient is ready for prostatectomy. If the period is prolonged, a suprapubic apparatus should be fitted and the patient allowed to go about.

It will sometimes happen that the facilities for carrying out this programme of draining the bladder are lacking. In this case, and unless you are absolutely satisfied that you can conduct the case with safety from sepsis, it is far better to place the patient under the surgeon at once without passing any instruments at all.

TYPE 2.—*The patient with frequent micturition, difficulty, and a well-marked enlargement of the prostate, and about 6 oz. or 8 oz. of residual urine.*

It is obvious that an operation will have to be done or catheter life commenced. In such a case the decision should not be left until an attack of retention has occurred. The danger of the catheter, whether it is passed as an emergency for the relief of an attack of retention or whether it is used regularly to remove residual urine, is that sepsis is inevitable. The result of introduction of bacteria is cystitis, and this is immediately followed by ascending pyelonephritis or surgical kidney.

After ten or fourteen days the attack usually subsides, but the urine remains cloudy. Recurrent attacks occur after fatigue, constipation, exposure to cold, dietetic indiscretion, and such causes, and it becomes apparent that the patient is gradually going downhill. The condition that we know as urinary septicaemia is developing.

In the great majority of patients on catheter life, whether they suffer from urinary septicaemia or not, there comes a time when, from increasing difficulty in passing the catheter or from haemorrhage or pain in passing it, catheterization is no longer possible and an operation must be done.

I have already stated my view that patients should never be allowed to get into this condition, and that early operation should be performed in order to avoid it. If infection has already occurred and urinary septicaemia has developed, the first aim of treatment should be to get rid of the combined back pressure and sepsis. This is done by draining the bladder.

A suprapubic cystotomy is performed under local anaesthesia or under gas and oxygen, and the patient is given large quantities of fluids and hexamine or salol. Rectal administration of saline may be necessary, for the patient may be unable to take sufficient fluid by the mouth. At the same time the bladder is flushed by constant irrigation through a catheter tied in the urethra and a Hamilton Irving suprapubic box.

Removal of the prostate is deferred until the urine is sufficiently clear and the tests of the renal function are satisfactory and the symptoms of uraemia and sepsis have disappeared.

TYPE 3.—*The patient complains of a little difficulty in starting micturition, and may get up several times at night. The prostate is found to be very large and elastic. There may be little residual urine.*

In this class of case the patient has difficulty in realizing that an operation is necessary. He objects, as he puts it, to having an operation done when he is quite well. He is, however, in a dangerous position. At any time, from slight causes, such as fatigue, chill, etc., he may have an attack of retention, necessitating the passage of a catheter under difficult conditions, with the possibility of septic infection, or he may gradually develop the condition of chronic retention of urine, with back pressure effects in the kidneys, that I have described. These issues should be clearly placed before him and an operation recommended to prevent them.

There is another outcome which you do not hear very much about. An adenomatous prostate occasionally becomes malignant. There are, I find, two types of malignant prostate with which we have to deal. In the one the prostate is hard, nodular, and fixed, and the change has evidently been malignant from the commencement; in the other there is an elastic adenomatous prostate, which at one part is hard and leathery and becoming fixed. Further, there are some cases in which an enlarged prostate, adenomatous on rectal palpation, shells out easily and completely, but the pathologist reports that at one part in the gland the appearances are those of a malignant growth.

This malignant development does not take place in a large percentage of cases, but it is met with sufficiently often to make it necessary to consider it in estimating the prognosis of a case of enlarged prostate treated without operation.

INDICATIONS FOR OPERATION.

In discussing the question of operation as opposed to catheter life with your patients, I would like you to consider the following points:

1. Enlargement of the prostate is a progressive disease, the rate of increase of which we cannot foretell.
2. As the prostate enlarges, the patient grows older, and is less able to withstand the effect of uraemia or sepsis, or the effects of a severe operation.
3. When the symptoms become acute, much damage has already been done to the kidneys; and although improvement may follow operation, much of the damage is permanent.
4. Some adenomatous prostates become malignant.
5. The mortality of catheter life is higher than that of prostatectomy.
6. A very large proportion of the cases of enlarged prostate treated by catheter are forced eventually to undergo operation.
7. The prognosis in such cases is much graver than if the operation had been performed without a period of catheter life.
8. A large proportion of the deaths after prostatectomy are due to the sepsis caused by pre-operative catheterization or the back pressure and renal inefficiency due to delay in submitting to operation.

THE TEACHING AND STUDY OF HUMAN ANATOMY.

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CONTRARY to currently accepted opinion, human anatomy is not a study of the dead, but of the living. It merely utilises the dead as a partial and imperfect means to an end. That end seeks to establish the essential foundations upon which the practice of medicine is based, and hence the place of anatomy in the medical curriculum. It is not a thing apart from the curriculum, but belongs to every part of it. Anatomy also endeavours to promulgate the welfare of peoples by the study and interpretation of the biological laws of life. The former is the particular province of the student of medicine and the surgeon, whilst the latter belongs more exclusively to the professional anatomist. It should, however, be the aim of both to correlate the study of life with that of disease, and hence anatomy, as a part of the medical curriculum, should lead up to the study of medicine and surgery. If anatomy fails in either or both of these objects it can hardly expect either the recognition or the prominence in our curricula to which it is really entitled.

That anatomy has too long been regarded and treated as a study of the dead is only too probable. Its textbooks and teachings still reflect the multiplicity of detail of the mid-Victorian period, but do so in an even more aggravated form, whilst the divorce from the clinician is more complete to-day than at any other period in the history of medicine. If anatomy is to be taught to medical students on purely academic lines apart from hospitals and the study of disease, in water-tight compartments of medical curricula, and with examinations which are mere feats of memory, so long is it certain that as thus taught, crammed, and forgotten, it subserves no useful purpose in the study of disease.

This conception of anatomy as an academic study of the dead has resulted in an over-accumulation of largely unimportant detail. The unfortunate student of medicine is unable to differentiate between the vital and the useless. To him articulations of carpal bones are of equal import with lymph glands, probably more, because he can see the former and very seldom sees the latter. Relations of trivial arteries—which the surgeon seizes and ties—are matters to be learnt by rote, and bulk, in the student's eyes, as largely as great veins, epiphyses, and lymphatics. Muscles are studied with a meticulous attention to trivial details of osseous attachment, but with no conception of their collective functions in the living subject. Swamped in a morass of detail the student can no longer see the distant tree of knowledge for the mud.

Man is an animal—a highly specialized one in some directions, much less so in others. In his bodily structure and functions he conforms in every detail to the great and