THE HARVEIAN LECTURES ON THE SURGICAL TREATMENT OF TUBERCULOUS DISEASES.

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LECTURE III.

GENITO-URINARY TUBERCULOSIS.

[The lecturer began by referring to various general considerations on the subject of genito-urinary tuberculosis, pointing out that the disease may affect almost all the organs in that system, and may begin in some cases in the urinary system and in others in the genital system, and may be either primary or secondary. As regards the relative frequency with which the two sets of organs are affected, Guyon found in 264 cases that the genital system alone was affected in 41, the urinary system alone in 88, and both together in 135. Where the disease is secondary to deposits elsewhere, most usually deposits in the lungs or in bones and joints, the urinary system is proportionally more frequently affected than in cases of primary origin. Reference was made also to the discussion as to the mode in which the affection spreads over the systems, the two views being the "descending" view, according to which the disease begins in the kidneys and spreads downwards to the genital organs; and the "ascending" view, according to which it begins in the genital organs and spreads upwards to the kidneys.]

The probability is that both of these are at times correct. In cases arising secondarily to tuberculosis elsewhere the disease very frequently begins in the kidneys, and may thus readily spread down to the bladder and prostate, and so on to the genital system. On the other hand, in primary cases the disease frequently begins in males in the epididymis, and from thence spreads upwards to the urinary system. It is also possible that the bacilli may be deposited in more than one place at the same time, or in one part shortly after another, there being no actual continuity of infection from one organ to the other.

Various predisposing causes have been mentioned, the chief as regards the bladder, prostate, and genital system being gonorrhœa; indeed, some authorities have assumed that the bacilli enter through the urethra, but this seems to be very doubtful. Schuchardt, as a matter of fact, found tubercle bacilli present in some cases of gonorrhœa; in one he noticed that as the acute symptoms subsided chronic catarrh of the urethra followed, and in the discharge the gonococci had almost completely disappeared, while tubercle bacilli remained; and as the result of his observations he concludes that we should admit a new form of primary disease of the mucous membrane—namely, a superficial tuberculous catarrh. Apart, however, from these observations, tuberculosis of the urethra appears to be very rare, although it does sometimes occur at the upper part secondary to the disease of the prostate, and also to tuberculous cystitis. The lecturer then went on to the consideration of tuberculous epididymitis.]

TUBERCULOUS EPIDIDYMITIS.

Of the male genital organs the epididymis seems to be that most frequently affected with tuberculosis, and as the disease rarely remains localised to the epididymis for any length of time, it is not always easy to be certain in cases seen at a late period whether it has originated in the epididymis or in the prostate or some other part. In adults, however, the probability is that in the majority of cases the disease commences in the epididymis. In many cases the lesions are bilateral. Bardenheuer, indeed, has found that in almost all the cases the lesions are or ultimately become bilateral.

The bacilli may reach the affected organ in various ways. Some assert that they may come from the urethra, but this seems to me to be very doubtful. They are probably most frequently deposited from the blood, or come by the lymphatic vessels, or they descend along the vas or by lymphatic vessels from the urinary system, or they may spread from the peritoneum. The latter mode of infection is specially observed in infants, and it is apparently not so rare as one would

at first sight imagine. In these infants one not infrequently finds the mesenteric glands enlarged, and the disease extending to the peritoneum, following down the vaginal process, and ultimately invading the testicle and epididymis. Under these circumstances the tunica vaginalis is first attacked, and the testicle is more often the seat of the disease than the epididymis.

In the epididymis and testicle we may have an acute tuberculosis which occurs in connection with general acute tuberculosis, and to which it is not necessary to refer, or we may have a local disease limited in the first instance to these organs. Of the local disease there are two forms, the one a local acute tuberculosis which generally begins in the testicle, and the other the ordinary or more chronic form, which usually commences in the epididymis. The acute form generally begins with the deposit of tubercles in the intertubular tissue of the testicle, and subsequently spreads to the epididymis, and the process goes on rapidly, and leads to destruction of the testicle. In the other and common form which commences in the epididymis, there has been much discussion as to the tissue in which the tubercles are first deposited, some holding that they first appear in the connective tissue outside the vas, and others that they commence in the interior of the duct. Probably the truth is that both forms of origin occur, that in some cases the disease begins in connection with the blood and lymphatic vessels outside the duct; while in others, and probably most frequently, it commences inside it. In connection with the latter view it will be remembered that tubercle bacilli have been demonstrated in the semen and the apparently healthy testicles of phthisical men, so that their presence in the interior of the duct, and the commencement of the disease in that situation in secondary cases especially, is highly probable. Growing in the interior of the duct, they set up, in the first instance, a catarrh with accumulation of epithelium in the lumen. These cells soon undergo caseation, and the duct becomes distended with caseous material; its wall at the same time becomes affected, and tubercles spread into the surrounding tissues. In some cases the process comes to a stop, and the caseous material is either absorbed or encapsuled, or calcareous salts are deposited in it. Very often, however, the mass breaks down and suppurates, and abscesses burst through the skin.

Much discussion has also arisen as to the part of the epididymis which is first affected. Bardenheuer maintains that the disease commences in the globus minor, owing to the stagnation of the secretion containing bacilli at the point where the vas leaves the epididymis, and where it has a more or less abrupt bend and is tortuous. The weight of evidence, however, is in favour of its commencement in the globus major. Wherever it begins, it quickly spreads over the whole of the epididymis, and before very long extends into the testicle itself, and also along the course of the vas. It is only in the early stage that the disease is confined entirely to the epididymis. Spreading into the testicle, the tubercles are first found in the corpus Highmori, usually in the intertubular tissue, and subsequently isolated tubercles can be found in the testicle. In the case of the vas it may spread along the interior of the tube, but in my own experience the tubercles are more frequently found in the lymphatic vessels in the wall of the vas and in the tissue around it. Spreading along the vas deferens, the vesiculæ seminales soon become involved, and ultimately the prostate; indeed, in some cases, the two latter structures may be affected without any detectable disease of the vas deferens itself.

[As to the symptoms, the lecturer pointed out that from the point of view of treatment one may divide the cases: (1) Into those of acute tuberculosis of the testicle and epididymis, which is comparatively rare, the disease beginning quite acutely, presenting the characters of an acute epididymitis in the first instance, frequently resulting in abscess within a very few weeks, the abscess being sometimes in the interior of the testicle. In a few of these cases the testicle alone has been found affected, the epididymis being at first free, and in these the local symptoms and pain are very acute. (2) The ordinary subacute or chronic tuberculous epididymitis which may be met with in various stages, and which may or may not be accompanied with abscesses or sinuses. The lecturer proceeded to examine the chief characteristic symptoms of tuber-

culous epididymitis, and then went on to consider the treatment.]

Treatment.

The treatment of tuberculous epididymitis, like that of other tuberculous lesions, must be considered under two categories, namely, non-operative and operative. It is certainly the case that a considerable number of cases of tuberculous epididymitis become quiescent either without suppuration or after suppuration has occurred, and the thickening may after a time almost entirely disappear. It is extremely difficult, however, to say in any given case whether it is likely to become quiescent or not. In the acute rapidly breaking-down forms, especially those affecting the testicle, one may feel pretty confident that they will not become quiescent; but in the more chronic cases where the swelling has been found more or less accidentally in the first instance, where it is firm, and where there is but little pain, one can never be quite certain. Some of these cases gradually improve under general treatment, while others, which at first may have seemed to be progressing favourably, break down and suppurate. In all of them, however, there is a tendency for the disease to spread to other parts of the genito-urinary system, or to the other side, even where the primary disease is improving. In fact, in the great majority of cases, when the patients come under notice the vesiculæ seminales, or at least the vesiculæ on the affected side, can generally be felt to be enlarged and nodular, and the disease tends to spread to the prostate, and thence to the urinary system.

Non-operative treatment may be employed either when the case when first seen is very chronic, with a strong tendency to recovery, or when other parts of the genito-urinary system are already seriously affected. It consists essentially in placing the patient under good hygienic conditions, in efficient support to the testicle and in the avoidance of injury. As regards drugs, benefit may be obtained from cod-liver oil, guaiacol, iodoform, etc. In addition to support to the testicle, compression and the application of ointments of mercury or iodide of potassium are frequently employed, but the former is to my mind a very doubtful measure, and as regards the latter I cannot say that I have seen any beneficial effect. If there is much pain or tenderness belladonna ointment is sometimes of use. In cases where the disease is evidently advancing, injections of various materials into the epididymis have been advocated, those most frequently employed being the iodoform emulsion so much used in tuberculous cases, and chloride of zinc, on the principle introduced by Lannelongue in the treatment of joint disease; these methods, however, do not appear to do any good, and the latter especially causes much pain.

The operative treatment may be either partial or radical; the former consisting of scraping and epididymectomy, and the latter of castration. Epididymectomy may, however, in some cases, especially when performed early, be classed as a radical and not a partial operation.

Some French surgeons more especially have advocated the employment of scraping or ignipuncture, and the former is useful in some cases where neither epididymectomy nor castration are advisable or permitted. Such are cases where there is suppuration or where abscesses or sinuses are present and where castration is not advisable or not acceded to by the patient. It has also been advocated at an early stage as a substitute for epididymectomy or castration, but I should not recommend it at that period. As I have already said in speaking of glands, one can only remove with a sharp spoon the soft breaking down tuberculous material; the tubercles situated in the firmer tissue beyond escape; and I can see no advantage in scraping out the epididymis at an early stage over the cleaner and more satisfactory operation of epididymectomy. If scraping is employed, a free incision should be made so as to expose the parts completely, and then, starting from the point where the abscess has originated, the cheesy mass in the epididymis should be thoroughly cleared out and portions of the wall around should be clipped away. It is well afterwards to sponge the surface with undiluted carbolic acid and then to pack the wound with iodoform gauze or cyanide gauze sprinkled with iodoform till granulation has taken place.

As regards the operative treatment for use in ordinary cases, two methods are at our disposal, namely, castration and

epididymectomy. I need not say anything about the mode of performing castration, but as epididymectomy is not generally known, I may describe that operation, and I shall describe the method employed by Bardenheuer, who was the first to advocate it.

The operator stands on the affected side, grasps the testicle and turns it outwards so that the epididymis looks towards the operator. An incision should then be made over the testicle, and as I think that the vas deferens should always be removed as high as possible, I should advise that the incision commence over the external abdominal ring, and extend downwards to the lower edge of the testicle. If an abscess is present which has caused adhesion of the skin, or if there is a sinus in the skin, the incision must diverge on each side of the affected skin so as to include it in the parts removed. The various tissues are then divided till the cord above and the testicle and epididymis below are exposed. The next step in the operation is to separate the epididymis from the testicle. These structures are only organically connected together by the globus major, the body being free, and the globus minor being simply attached by fibrous tissue. In separating them, therefore, one begins at the body and the globus minor. Without much trouble a blunt instrument can be very soon insinuated between the body of the testicle, unless in advanced cases where marked adhesion has taken place between the two. The globus minor is then removed by detaching it from the tunica albuginea, and when the body and the globus minor have been thus detached, one can raise them up and so ascertain the conditions and relations of the globus major. At this stage care must be taken to avoid division of the vessels which enter and supply the testicle. These are present on the deeper surface of the epididymis as it lies in the position indicated, that is to say, they enter the testicle chiefly on the inner side of the epididymis. On that side, therefore, the substance of the cord should be pushed off from the epididymis with the handle of the knife, after incising the tunica vaginalis. On the other side the incision is made through the tunica albuginea, close to the margin of the testicle, and then the connection between the globus major and the hilum is divided, and in this way the epididymis is separated from the testicle and remains attached to the vas. If it is found that the hilum at the point of detachment is not perfectly healthy, one may cut into it and remove portions of the tissue, taking care as far as possible to keep to the outer side. Indeed, further slices of the testicle itself may be taken away if it is found that marked disease is present. The vas deferens is then freed from the other structures of the cord and followed up to the external ring, and it is pulled down through the external ring as far as possible and divided as high up as possible. After tying the bleeding points the incision in the testicle is closed by two or three catgut sutures and the wound sewn up. It is not necessary to suture the tunica vaginalis. Usually, if the surface of the testicle and the tunica vaginalis are rinsed out with sublimate solution, no subsequent hydrocele occurs. It is very important to see that all bleeding points are stopped, otherwise the scrotum may become very much distended with blood and healing thus much delayed. If there is much oozing, it is well to put in a drainage tube at the lower part for from twenty-four to forty-eight hours so as to allow the blood to escape.

We may now discuss the relative advantages and disadvantages of these two operations and the cases for which they are severally suitable.

1. Castration.

If one regards the affected part alone, this is certainly the most effectual operation, especially if combined with section of the vas as high up as possible; and were it not for the objections to be presently mentioned, it is the operation which one would advocate in preference to any other. In some cases, indeed, it is necessary, while in others, in spite of the objections, it is advisable. It is necessary, for example, in cases of acute tuberculosis of the testicle and epididymitis at an early period as the only possibility of checking the disease, and it is also necessary in cases where the pain is great, and more especially where it is due to suppuration of the substance of the testicle. It is advisable in some of the advanced cases where there is much suppuration, and where the patient's health is giving way as a consequence, even

although disease may be also present in the vesiculæ seminales and the prostate.

On the other hand, castration in cases of tuberculous epididymitis is a very serious operation, and one not lightly to be undertaken. If one could be sure that the removal of one testicle alone would arrest the disease, or at any rate that the possibility of the other becoming attacked was extremely slight, then undoubtedly castration would be the best procedure at an early stage of the disease; but unfortunately this is not the case. Even quite at an early period the trouble spreads along the cord and affects the vesiculæ seminales, or at least the vesicle on the affected side, and in many cases the epididymis on the other side becomes sooner or later attacked. The proportion of cases in which both sides are affected is variously given by different writers, but in my experience the majority of the cases are ultimately bilateral. The affection of the second epididymitis may occur soon after that of the first, or it may be delayed for a long time. In a case which I had last summer, an interval of seven years had elapsed from the time when I had removed the first testicle before the second became affected. It is this tendency to disease of the second testicle which renders the operation of castration such a very serious one, and for the following reasons: In the first place, if one testicle has been already removed the patient becomes extremely discouraged when he finds that the disease reappears on the other side; he is very apt to blame the surgeon, as if he were at fault, and is by no means ready to submit to a further operation. Besides, as one cannot assure him in the first instance that the disease will not reappear on the other side, indeed as one ought to tell the patient of the possibility of the other side becoming diseased before performing castration, it is by no means easy to persuade him to have the operation done at an early period in the course of the disease at the only time indeed when the operation gives a fair prospect of complete recovery. There can be no doubt that the loss of both testicles exercises a very deleterious effect on the patient, more especially as the disease has previously produced great mental depression and anxiety. In young patients this effect is not so marked as in those who are getting up in years, but in them the result is often that they lose interest in their affairs, become less acute men of business, become lazy, irritable, and morose, and in some cases may actually become demented, or maniacal. Indeed, in these cases of double castration for tuberculous testicles a very considerable proportion have ultimately committed suicide. Some attribute this mental disturbance entirely to the psychological effect of the loss of the testicle and the fear of consequent sterility, and surgeons have tried to deceive the patients by introducing artificial substitutes, such as celluloid, silk, etc. Apart, however, from the fact that healing does not always occur over these materials, and that they not infrequently have had to be removed subsequently, the fact that a patient could in this way be deceived would almost imply that his mental calibre had already been impaired. These attempts have not met with much success, and have been now practically given up.

Apart however from the generative function of the testicles it is now generally admitted that they have another and most important action, and that by means of their internal secretion they exert a very great influence on the well-being of the patient, and it is to the loss of this internal secretion that the bad effects of double castration are mainly due. There is ample evidence that where the vasa are blocked as the result of inflammation, or where they are removed and thus the generative functions are abolished, the testicles do not as a rule waste, nor are those serious effects to which we have referred produced.

A further question has been raised, namely, whether after the removal of both testicles the patients do not more readily succumb to the attacks of the tubercle bacillus as well as of other organisms than where they are present, and experiments which have been performed on dogs seem to support this view, dogs which have been previously repeatedly injected with testicular fluid resisting inoculation with tubercle bacilli, while others not so prepared have succumbed.

2. Epididymectomy.

These objections to castration are to a great extent met by

the operation of epididymectomy. In the first place, one must bear in mind that the generative function of the testicle is at once destroyed by the disease, and thus the patient is placed in no worse condition by the removal of the epididymis and vas as regards that point than if no operation were performed. At the same time, with epididymectomy the testicle is left and the internal secretion remains. Hence the great difficulty as regards early operation is removed, and the patient is more likely to consent to this operation at an early period, when it may be of benefit in arresting the disease than if castration were proposed. And even if the disease, does appear on the other side subsequently, a similar operation is more readily acceded to. Besides, if one is only going to remove the epididymis, one need not delay the operation because some cases get well without operation; for what you propose to do does not place the patient in a worse condition than he is in at present, while, on the other hand, it may, when performed sufficiently early, be the means of arresting the spread of the disease.

As regards the results of epididymectomy, the majority of the wounds heal without any trouble. In some cases, more especially where the disease is advanced, a fistula is left, and if this is the case one may, after a time, scrape out the fistula, and not infrequently, on scraping out such a fistula, one finds only a small cheesy patch, after the evacuation of which the wound heals. As regards function, it is found that after the removal of the diseased epididymis the patient, who has generally been in a depressed state before, recovers his tone, while the sexual functions, which were previously in abeyance, return, and may even be increased. Again, epididymectomy is of use where the vesiculæ are affected, for the disease in the vesiculæ, and even in the prostate, frequently comes to a standstill. I have indeed seen the same after unilateral castration, so that disease of the vesiculæ seminales is not really an absolute contraindication to epididymectomy. It is probable that, when the flow along the duct carrying bacilli with it, and the lymph flow are arrested as the result of the operation, a considerable stimulus to the extension of the disease in the vesiculæ and in the prostate is removed; and, further, we must bear in mind the influence which the removal of the vasa in other cases seems to exercise on the prostate.

Various objections may be urged against the operation of epididymectomy, of which the following are the chief. (1) The operation is often only partial, because tubercles and tubercle bacilli may be present in the testicle itself; this is no doubt true in many cases, unless the operation be performed at quite an early period, but I have already pointed out that partial operations are sometimes very effective, especially where the tubercles left behind are isolated and not in masses. Besides, the operation cuts off the communication between the testicle and the rest of the genito-urinary system, and even if recurrence takes place in the testicle, it can be treated locally by scraping out sinuses and so forth. (2) It has been pointed out that one may find on cutting down that the testicle is badly diseased, and that castration is necessary after all; granted that this may be the case, the condition is no worse than if we cut down with the intention of performing castration in the first instance, and we have on the other hand the satisfaction of knowing that we are not needlessly sacrificing an important organ. (3) It is urged that the vascular supply to the testicle may be interfered with, and that that organ may subsequently necrose; this has certainly happened in some cases, either where sufficient care has not been taken to avoid injury to the vessels entering the testicle, or where the disease of the testicle itself has been so extensive that it has been necessary to take away the greater part of that organ. In the latter case it is of course doubtful whether castration was not the proper procedure in the first instance. (4) Bardenheuer himself thinks that recurrence on the other side is perhaps more frequent after epididymectomy than after castration, and he further states that the secondary disease may be more acute than the primary. That, however, does not seem to be the general experience; besides, if it were so, and castration were necessary on the other side, the patient would still be left with one testicle, whereas in double castration both are taken away.

From these various considerations it seems to me that the operation of epididymectomy is well worthy of more consider-

ation than it has yet received in this country, but like other procedures it must be employed with judgment, and is by no means applicable to every case. It is distinctly contra-indicated where the whole of the body of the testicle is diseased; where there is a deposit in the centre of the testicle; where there are advanced lesions of the vesiculæ and prostate, especially with suppuration; where the urinary system is invaded; and where the patient is suffering from advanced phthisis. In these two latter cases castration or scraping are the better operative procedures if operation is necessary at all.

TUBERCULOSIS OF THE PROSTATE.

[After detailing the general symptoms of tuberculosis of the prostate, the lecturer went on to describe the course which abscesses followed, and the treatment of the disease.]

The abscesses which form in connection with tuberculous prostate not uncommonly burst into the urethra, leaving a ragged ulceration which does not readily heal, and through which urine makes its way into the interior of the prostate. In other cases, where they are situated more towards the back of the organ, the abscesses may perforate into the rectum; infection then occurs in the abscess cavity which leads to further extension of the suppuration and an opening into the urethra as well, so that a recto-urethral fistula is very apt to be established in these cases. Again, the abscess may make its way down to the perineum, and may ultimately burst there, leaving sinuses which lead up towards the prostate. This condition of suppuration in connection with tuberculosis of the prostate is a very serious one, and one which it is very difficult to treat with satisfaction; and therefore the progress of a case of tuberculosis of the prostate must be very carefully watched, and should symptoms of suppuration occur surgical intervention should be at once adopted.

Treatment.

The treatment of tuberculous disease of the prostate resolves itself into palliative and operative treatment. The palliative treatment consists in rest, good hygiene, the avoidance of sexual excitement, the employment of antiseptic injections *per urethram*, the administration of antiseptics by the mouth, which pass out with the urine, the use of morphine and belladonna suppositories, and so forth. So long as there are no signs of breaking down and no marked increase in the prostatic trouble, the case should be watched without operation. In France some surgeons recommend that if the disease is progressive, injections of iodoform in glycerine or ether, or injections of chloride of zinc, should be employed, and various operations have been elaborated with the view of carrying out these injections. In employing chloride of zinc, for instance, some surgeons open the urethra in the membranous part, and then push a needle attached to a syringe containing chloride of zinc into the substance of the prostate. Others, again, introduce a needle through the rectum, but this is very apt to be followed by sepsis. Some have even done a suprapubic cystotomy.

This injection method is, however, a most uncertain and unsatisfactory one, and it cannot be at all recommended. Certainly it is not so satisfactory as to lead one to perform any of the operations above-mentioned with the view of carrying it out. Practically surgical intervention limits itself to cases where suppuration is occurring, and in these instances it should be carried out early with the view of evacuating the pus before the abscess opens into the urethra or into the rectum. For this purpose the best way of reaching the prostate is probably by means of a transverse or curved incision with the convexity forwards just in front of the anus. This is deepened, the urethra pushed forward, its situation being indicated by a sound, and the rectum pushed backwards, and as it is deepened the levator ani is divided.

Usually where an abscess of any size is present one finds after getting through the levator ani that the finger passes into a large cavity containing the pus, and from thence one can follow out the cavity into the prostate. Having opened the abscess, it should be scraped out, care being taken, of course, not to scrape through the wall of the urethra or of the bladder, and having evacuated it as thoroughly as possible the cavity should be packed with iodoform gauze. This operation should be done even in cases where pus is escaping into the urethra, because without it the patient is almost

certain not to get well. Where however the abscess has already burst into the rectum, it is well to avoid an operation of this kind, for the result would be very apt to be a rectal fistula. In these latter cases it is better to dilate the anus and attempt to enlarge the opening into the rectum and scrape out the cheesy deposit through that opening, and in those cases the wound may heal.

In the after-treatment a catheter should be tied in for a week or ten days, and if there has already been a communication between the urethra and the abscess cavity, the patient should be taught to pass a soft catheter for himself until the wound has healed. Healing usually occurs fairly satisfactorily in these cases where all the cheesy material has been removed. A sinus may, however, remain for a long time, or it may be necessary to open up the wound again, but in most cases the result is fairly satisfactory.

TUBERCULOSIS OF THE BLADDER.

[After referring to tuberculous disease of the vesiculæ seminales, the lecturer went on to consider the question of tuberculosis of the bladder. He pointed out that although usually secondary, it did occasionally occur primarily, being more frequent in males than in females and affecting by preference young adults. The tubercles are deposited in the superficial layers of the mucous membrane, and may be numerous, and lead to superficial ulcers. They are most common about the apex of the trigone, but the condition may extend over the whole of the bladder. The bladder is very much diminished in capacity, the walls being thickened partly as the result of hypertrophy of the muscular fibres, and partly as the result of chronic inflammation. After discussing the symptoms of the disease, the following remarks were made with regard to treatment:]

Treatment.

The treatment may be either medical or surgical. Unfortunately, by neither method can we with any certainty bring about a cure, but, nevertheless, much may be done to relieve the patient's distress. Medically, good hygiene, country or seaside air, etc., are of the first importance, and light exercise is also advisable. In acute cases relief may be obtained by warm saline baths, mustard to the hypogastric region, warm water injections into the rectum, etc. The food should be light and easily digestible, and consist essentially of large quantities of milk. Cod liver oil should be given in large doses, and benefit may also be obtained from the use of arsenic, creosote, opium, and belladonna for the pain, etc. These means are, however, often ineffectual, and local measures are frequently adopted, more especially washing out the bladder so as to get rid of the pus and mucus, and injecting various substances either to relieve the pain, such as weak cocaine or opium, or antiseptic substances, with the view of trying to interfere with the growth of the bacteria. Warm boracic lotion, about from 3 to 4 per cent., is one of the most suitable fluids for washing out the bladder. Iodoform and glycerine are often injected into the bladder and left in, but the results are disappointing. Iodoform and vaseline, about 6 drachms of a 5 per cent. mixture, has been strongly advocated by some French surgeons. Injections of nitrate of silver, which are of use in other forms of cystitis, almost always do harm. The instillation of weak sublimate solution (1 in 1,000 to 1 in 5,000) has been employed, and is much praised by some. Cocaine and opium injected into the bladder are very transient in their effects, and must be very carefully used, as they are apt to be absorbed. Benzoic acid taken internally helps to keep the urine sweet. Pills of iodoform in $\frac{1}{2}$ -grain to 1-grain doses, tincture of buchu, tritum repens, etc., may be employed. Attempts have also been made to increase the capacity of the bladder by gradual distension with fluid, and this subject has been referred to by Mr. Battle only as recently as in the *Lancet* of December 9th.

Coming now to the more strictly surgical treatment, it must be admitted that it is by no means always efficacious; nevertheless, in many cases marked relief is afforded to the patient, while in some the disease apparently subsides. This is more especially the case in those instances where tuberculosis of the bladder is the primary disease. Even where a cure is not obtained, the relief afforded to the great sufferings of the patient amply compensate him for the operation.

The operative interferences consist in opening the bladder

and draining it, in attempting to remove the tuberculous ulcerations, or in applying antiseptic substances to them. My own opinion is that the essential benefit which follows operative treatment is the result of the drainage of the bladder which is thus placed at rest. In two cases in which I did nothing else marked improvement resulted—quite as marked as in cases where attempts have been made to get rid of the ulceration or to destroy the bacilli. Nevertheless, I think that, although the essential point is rest to the bladder, it is well, if one can, to try to improve the ulcerated condition. In some cases where the ulcers are quite small, the piece of mucous membrane and the ulcer may be pinched up and snipped off, any bleeding being stopped by the electric cautery. In other cases where the ulcer is large an attempt may be made to scrape away the surface by a sharp spoon; this of course is difficult, seeing that there is no firm background against which to scrape. A background may be provided by a bag in the rectum, or in some cases where the ulcer is low down by the finger in the rectum; but in any case scraping the ulcer cannot be very satisfactory. After scraping it as well as one can, it is well to touch the surface of the ulcer with the point of an electric cautery. Having scraped and cauterised the ulcers, some iodoform should be rubbed into the surface, and then the bladder should be left open and drained. This is best done by introducing an indiarubber tube into the bladder above the pubes, and carrying the other end into a basin of antiseptic solution. Care should be taken that the tube does not go too far into the bladder; if it touches the posterior wall of the trigone it is apt to give rise to great spasm, and thus make the patient worse instead of better. In most cases it suffices to have the end of the drainage tube simply projecting into the bladder, and to prevent it shifting its place it is well to take a stitch through the tube, the wall of the bladder, and the skin, which can be afterwards removed when one wishes to remove the tube. The skin should be stitched up around the tube, so as if possible not to permit any leakage, and the tube should be large enough to thoroughly fit the hole which has been made into the bladder. The wall of the bladder above the ureters may project forwards and touch the anterior wall at the lower part, so as to leave a cavity in which urine collects, and which the patient passes *per urethram*. Under such circumstances of course the rest to the bladder is insufficient. This may be avoided to some extent by raising the foot of the bed very considerably so as to take the weight of the intestines off the upper part of the bladder, but in some cases it may be necessary to put in a longer tube. The tube should be left in for from four to five days, and then should be taken out, washed, and reintroduced. It is well to wash out the bladder twice a day through the tube with weak boracic lotion at the temperature of the body, and some introduce from time to time a little iodoform and glycerine emulsion; the latter is not, however, of any great consequence. The drainage of the bladder should, in my opinion, be kept up till, as far as one can judge, the cystitis has completely subsided; I believe that it should be continued for at least six weeks, and I have continued it for as long as six months in one case. Some French surgeons close the bladder at once without drainage, being content with excising and cauterising the ulcers. This I have never attempted, and I very much doubt if it is likely to be so satisfactory as thorough drainage of the bladder and complete rest to the organ.

Along with the local treatment, the general health should be attended to. Large quantities of milk should be given, and also large quantities of cod-liver oil, good hygienic conditions, and the other palliative measures already alluded to in speaking of the medical treatment.

As to the results of treatment, my own experience in 5 cases has been complete cure in 1 case and relief in the other 4. In 1, about six months after the first operation, the left kidney was found to be enlarged and tuberculous, and was removed, the result being marked improvement of the patient and almost complete cessation of symptoms for two or three years. At the end of that time, however, he returned with increased symptoms again. In the other cases, the patients left my care very much relieved but still with some pus in the urine, and with a certain amount of frequency and slight pain. More extensive statistics seem to show that about 85 per cent.

of the cases are much relieved by the operation and about 20 per cent. are apparently cured.

TUBERCULOSIS OF THE KIDNEY.

[The lecturer pointed out that this also may be primary or secondary. It is not uncommonly unilateral in the early stage, but there is a considerable tendency for the second kidney to be attacked. The disease also almost always affects the ureter. After discussing the symptoms of tuberculous kidney and the diagnosis of the disease, the author made the following remarks with regard to treatment.]

I need not go into the medical treatment of tuberculous kidney, and indeed I have but little time to refer to the surgical treatment. Of late years the application of surgery in the treatment of renal tuberculosis has become more and more frequent, but we are still far from having attained to any clear ideas as to the best surgical procedure, nor can we always obtain a good result. The surgical procedures which may be adopted are:

1. Incision into the kidney or nephrotomy, or nephrotomy followed by drainage of the kidney through a lumbar incision with the view especially of enabling the more rapid escape of the decomposing pus, and also preventing infection of the urinary passages.
2. Nephrotomy accompanied by scraping out of as much as possible of the tuberculous material.
3. Nephrectomy often accompanied by the removal of a portion or the whole of the ureter as well.
4. Partial nephrectomy in which only the diseased portions of the kidney are taken away.

Before proceeding to surgical measures one must try to ascertain the following points: (1) Whether the disease is really situated in the kidney; (2) which kidney is affected; (3) whether the kidney is the only one of the genito-urinary organs which is diseased; (4) to what extent the disease in the kidney has gone; and (5) whether the disease is unilateral or whether the opposite kidney is also affected.

With regard to nephrotomy, which was the operation almost solely employed at first, it consists in making an incision down to the kidney in the lumbar region, opening the pelvis, and attempting to establish a permanent opening through which the pus and urine may escape. This operation is, however, only slightly curative; in a certain number of cases no doubt the kidneys do shrink up and the disease becomes quiescent, and the fistula may ultimately be allowed to heal; but in the majority of cases the disease goes on, and but little benefit results. By these means it is very difficult to prevent pus escaping down to the bladder, and thus one object of the operation, namely, that of preventing the spread of the infection, is defeated, while this difficulty is further increased by the constant tendency of the opening to contract; and, further, in cases where the opening remains patent the patient ultimately finds that this constant escape of urine in the loin is a source of great trouble to him. Nephrotomy is, however, indicated where the general state of the patient is so bad as not to permit of any more prolonged operation, and where, on the other hand, the progressiveness of the trouble necessitates immediate intervention. It is also necessary where there are perinephritic abscesses, and also where one is not certain that the other kidney is healthy. In most cases, however, it must be looked on as a preliminary operation, with the view of getting rid of the fever and generally bad condition of the patient, and after a time the question of nephrectomy as a curative procedure must be considered.

Nephrectomy.

In order to justify nephrectomy one must be pretty sure that the other kidney is intact, and also that the bladder is free from disease. These are points which it is by no means always easy to be certain of. The condition of the bladder may no doubt be made out by cystoscopic examination, and the condition of the other kidney might also be ascertained at the same time if there was much pus coming from it. But very often the urine discharged from the second kidney, although it is diseased, does not contain enough pus to enable one to make a certain diagnosis by a cystoscopic examination. In the female, no doubt, one can pretty easily catheterise the ureters, and so examine the urine from

each kidney separately; and before performing nephrectomy it would be well to do this. In the male the procedure is so difficult that I doubt if, even in the most expert hands, complete reliance may be placed on the result. Other ways in which the condition of the other kidney may be ascertained have been adopted. For example, some surgeons advocate that before performing nephrectomy an incision should be made into the abdomen in the middle line in front, and both kidneys examined by palpation. This is, however, a very uncertain method.

On the one hand, no doubt, if one finds that a kidney is nodular and knobby, with all the other symptoms of tuberculous kidney, one may safely say that it is tuberculous, but it does not always follow that because a kidney is smooth and of normal size that it is not tuberculous. Again, where one finds that a kidney is distinctly enlarged one is apt to look on that along with the other signs of tuberculosis as an indication that that is the affected kidney; but it has happened more than once that the kidney on the side where tuberculosis was suspected has been small or normal in size, while that on the other side was markedly enlarged, and subsequent examination has shown that the small one was the tuberculous one, while the large one was simply a healthy one undergoing compensatory hypertrophy. Hence palpation through the abdomen is in reality of very little use, and only adds to the complications and risks of the operation. More important than palpation through the abdomen is the proposal to cut down on each kidney; in the first place, to cut down on the kidney which is supposed to be diseased, and to ascertain without opening the kidney whether the conditions are such as to render nephrectomy advisable; if this is the case to temporarily stitch up the wound, turn the patient over on the other side, and expose the other kidney, which should then be turned out, and, if necessary, incised with the view of making sure as to its healthy condition. The objections to this procedure are that it of course means extra shock, which cannot always be borne by a patient with tuberculosis of the kidney; and further, even with incision into the kidney one cannot be quite sure that there may not be early tuberculosis at some part. Nevertheless this procedure is the one which it is probably best to adopt if by no other method of examination one can come to any definite conclusion as to the healthy condition of the second kidney. In some cases, however, the matter must be left to chance; and where the patient is suffering very severely, and one kidney is hopelessly disorganised, one must allow him to take his chance as regard the condition of the other kidney, for if the one kidney is hopelessly destroyed, one must assume that he has been living with the other kidney, and that unless there is any reflex suppression of urine as the result of the operation, he can still go on living with the other kidney after the removal of the first, and with a better chance of recovery when the debilitating disease on the one side has been removed.

The chief indications for nephrectomy are the unilateral character of the lesion, the absence of lesions in other organs, definite symptoms of tuberculosis, and sometimes the occurrence of severe hæmaturia. The contraindications are where the general state of the patient is very grave, where there is tuberculosis of the second kidney, or where there is tuberculosis elsewhere. There is no doubt that of all the procedures adopted for tuberculous kidney nephrectomy gives the best results. At the same time one may occasionally have a disastrous result where there is disease on the other side. Nephrectomy also may be performed either as a primary operation or secondarily to nephrotomy. The operation is no doubt most simple and most likely to be beneficial where it is a primary operation, but in some cases, as has been before remarked, the condition of the patient is so bad in the first instance that nephrotomy is all that can be done, and then when the patient's condition has improved the question of nephrectomy has to be considered. In these cases, where the kidney is removed secondarily, one generally finds that the adhesions have very much increased in number, so much so that the operation is prolonged, accompanied with considerable loss of blood and much shock, and there is also a risk of damaging the vessels which have been displaced by the contraction of the fibrous tissue. In some cases, indeed, the best plan is to remove the kidney piecemeal rather than to attempt to

take it out as a whole, but where it can be removed as a whole it should be done. Under such circumstances the capsule is separated till the hilum is reached; a pair of forceps are then applied over the hilum, and the kidney broken up and removed in pieces; finally, the hilum is examined carefully and the vessels tied.

In all cases in which the kidney is removed one must remove more or less of the ureter, and if necessary the whole of the ureter should be removed, and this can be readily done by an incision running downwards in the lines of the operation for tying the common iliac artery. As regards the operative procedures, where there is no perirenal abscess, and not much adhesion of the kidney, the oblique lumbar incision is perhaps the best; but in advanced cases especially after a previous nephrotomy, I prefer Terrier's method.

Of late good results have been obtained in some cases by a partial nephrectomy, especially in the early stage, the diseased portions of the kidney being removed, and the rest left behind. Several cases of this kind are chronicled in Mr. Henry Morris's lectures on *Diseases of the Kidneys*. The portions involved in the disease are scraped and clipped away, and the remainder of the kidney is tightly stitched up. In a considerable number of cases, however, the removal of the rest of the kidney has subsequently been necessary. This partial operation may also be combined with nephrotomy in cases where, on cutting down on the kidney, nephrotomy is found to be the desirable operation. Any bosses on the surface should be cut into and all the material scraped out, and if the kidney is fairly loose and can be taken out of the wound, one can pretty thoroughly clear out the tuberculous material. These cavities should then be packed, a drainage tube introduced into the pelvis and the wound closed. Some indeed stitch up the kidney after such operations without any drainage, but the other is probably the better procedure.

As a matter of fact, owing to the uncertainty as to the exact state of matters, when one cuts down on a tuberculous kidney, one must do so with an open mind, prepared to do one of the various operations which we have referred to; either to remove the whole kidney, to remove portions of it, or to be content with a nephrotomy combined or not with scraping. But on the whole, where the other kidney is healthy, the best results are obtained by nephrectomy.

LECTURES

ON

PHARMACY AND THE BRITISH PHARMACOPŒIA.

*Delivered before the Society of Apothecaries of London,
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LECTURE III.

THE PHARMACOPŒIA IN ITS RELATION TO PHARMACISTS.

Influence on Prescribing and Dispensing.

MASTER, WARDENS, AND GENTLEMEN.—If I had some hesitation about my first two lectures on the subject of the *Pharmacopœia*, I have more about this, in which I have to deal with much that relates to practical work. In the construction of the *Pharmacopœia* it was all very well to have in our minds ideals of what would be desired by students and medical men, but our labour has been in vain if we have produced a useless, an unworkable *Pharmacopœia*. In this last lecture, in which I propose to deal with the part important to those engaged in the preparation of pharmacopœial substances, data are wanting to show whether, on the whole, we have succeeded or failed. In the first place, of course, we have to look to the influence of the *Pharmacopœia* on prescribing and on dispensing; to inquire whether it facilitates either or both.

For this purpose we must consider the alterations introduced into the *Pharmacopœia*. Now alterations in the volumes are to be found on every page, in nearly every line, but for the purposes of this lecture, it is convenient to consider them in the way in which they are given in the prefatory pages, as alterations in