

The Journal of the American Medical Association

Published under the Auspices of the Board of Trustees.

VOL. XLVII.

CHICAGO, ILLINOIS, DECEMBER 22, 1906.

No. 25.

Original Articles

TREATMENT OF TUBERCULOSIS OF THE KIDNEY AND BLADDER BY NEPHRECTOMY.*

LEONARD FREEMAN, M.D.

DENVER.

It has recently been recognized that tuberculosis of the kidney is much more common than was supposed, and considerable attention has been directed to its treatment by early nephrectomy. In this connection Senn has estimated that one out of every eighteen consumptives suffers from some form of genitourinary tuberculosis; while the Pathologic Institute at Prague, found 5.6 per cent. of renal involvement in autopsies on adult tuberculous patients, and Rillet and Barthez 15.7 per cent. in children.

For a long time it was believed, as taught by Guyon, that the tubercle bacillus seldom infected the kidneys through the blood, but almost invariably ascended through the ureters from the bladder. These views have undergone a radical change and the hematogenous origin is now commonly recognized. For instance, Schéde says: "It has been proved beyond all doubt, and is generally accepted, that the principal mode of infection is through the blood." Clinical experience is furthermore strongly supported by the interesting experiments on animals, made by Baumgarten and others, showing that tuberculous infection in the genitourinary system follows the flow of the secretions, from the testicle toward the prostate and from the kidneys to the bladder. Hence, there are two entirely separate systems, with the bladder as a more or less neutral point; it being seldom, if ever, the seat of primary infection, although it is frequently involved from above, but rarely from below. There is evidence, however, that when the bladder has once become infected, either from above or from below, danger exists of the disease ascending to a sound kidney; but it is difficult to see how this could occur except in rare instances of vesical and urethral dilatation from obstruction to the outflow of urine.

It has often been claimed that cases of ascending and descending infection can be differentiated by noting the points at which the tuberculous process has reached the greatest development. It must be understood, however, that this could only be determined by an operation or an autopsy; because advanced renal tuberculosis often remains almost without symptoms, while the comparatively slight secondary involvement of the bladder may cause so much suffering as to engage the entire attention of both patient and physician. But even when the parts are open to inspection, it is difficult to reach a reliable conclusion, because the stage of development of a tuber-

culous lesion does not always depend on its age, as is frequently manifested in the lungs and elsewhere. Besides, it is questionable to assume, as has been done, that infection from the blood always takes place primarily in the parenchyma of the kidneys; for it may occur in the pyramids or even in the pelvis. And if infection did appear first in the outer portion of the kidney, the lesion might remain insignificant or even disappear, while lesions lower down, in the pyramids, pelvis, ureter or bladder, were more progressive.

Renal tuberculosis is at first often unilateral—in 90 per cent. of the cases as estimated by Israel, while others place the proportion still higher. This, like so many other recent additions to pathology, has been learned at the operating table rather than in the postmortem room; for by the time a case comes to autopsy the second kidney may have become infected through the blood, or through the bladder, if you will. Admitting this unilateral origin it becomes clear that the majority of cases can be cured by nephrectomy, if recognized sufficiently early, thus adding one more to the heavy diagnostic responsibilities of the modern physician.

The shortcomings of medicine in this heretofore discouraging disease are too apparent to require emphasis. In spite of the fact that with some patients the disease becomes latent for longer or shorter periods, and a few recover, the large majority rapidly pass from bad to worse, with all the suffering incident to renal degeneration and painful harassing cystitis. To be sure, some benefit may arise from residence in a favorable climate, such as that of Colorado, and drugs are perhaps not altogether useless, but reliance on these things is unsatisfactory, to say the least.

The accumulated evidence of many observers has finally demonstrated that early nephrectomy, before involvement of the bladder occurs, is the best treatment for unilateral renal tuberculosis, provided the general condition of the patient will permit. We can not even afford to temporize too long with what appear to be mild or incipient cases, because we can not be sure of the extent of the disease from the symptoms. Even the appearance of the urine is unreliable, because it depends on involvement of the renal pelvis, which may occur only after considerable destruction of parenchyma has taken place. I have been strongly impressed with this in my own cases, in one of which (Case 8) a large parenchymatous abscess existed, together with numerous scattered tubercles, in the presence of apparently normal urine. Furthermore, it is in the early stages of the disease that the most brilliant operative results are achieved.

Tuberculosis elsewhere, if not too far advanced, is not a contraindication to operation, because improvement often results. Especially is this true of the bladder, which may get better or recover, even in bad cases, after the removal of the source of infection, as has occurred frequently in my own experience. This is sim-

* Read at the Salt Lake Meeting of the Western Surgical and Gynecological Association, Sept. 1, 1906.

ilar to what may take place following castration, when the bladder trouble has ascended from the testicle.

It may even be said that the first step in the treatment of a tuberculous bladder, when the disease has descended from a kidney, should be a nephrectomy, when possible. Without operation, all efforts at treatment are generally unsuccessful, while with it improvement, at least, may be confidently expected.¹ An extreme instance in point is reported by Kümmell, in which there coexisted tuberculosis of both testicles, both seminal vesicles, the bladder and both kidneys, together with a tuberculous periurethral abscess, the patient suffering great pain and prostration. Most of the actual difficulty seemed to center in the left kidney, and this was removed. Immediately a marked improvement took place, so that the patient was relieved and was able to return to his work. It must not be forgotten, however, that tuberculous disease of the bladder is often only apparent, as a reflex from the kidney or a result of irritating discharges. So deceiving is this, that operations on the bladder have frequently been done by mistake.

The one essential to be kept constantly in view is that the second kidney must be sound, as regards both function and tuberculosis. This can easily be determined in most cases by the various means now at our disposal—the Harris segregator, the catheterizing cystoscope, and the different ways of determining excretory capacity; although the last mentioned methods have not proved to be as reliable as could be wished, in fact, so experienced an authority as Rovsing has seen fit to discard them entirely. Occasionally, it may be necessary to make an exploratory lumbar incision as in two of my cases (Cases 11 and 14), or even to take some chances when there is great urgency.

The weight of evidence is against partial nephrectomy, however enticing it may seem in theory, for it is impossible to be sure that all the disease has been eradicated. My own limited experience has impressed on me the extreme difficulty of detecting the small and widely scattered foci which frequently exist. Nevertheless, it is interesting to note that Morris successfully excised a tuberculous focus from the kidney of a woman whose other kidney had previously been removed for the same disease.

Nephrotomy is never indicated except for the purpose of relieving great suffering in those who for some reason can not undergo nephrectomy. A cure can not be expected, and a troublesome urinary sinus nearly always results.

CASE REPORTS.

I have operated on only 14 cases for renal tuberculosis, but these seem to illustrate and emphasize some important points.

CASE 1.—Mr. S., aged 33, with a history of incipient phthisis, had suffered for four years with frequent attacks of more or less severe abdominal pain centering in the region of the appendix, accompanied with frequent urination and a burning sensation at the end of the penis. He had lost much in weight and energy.

Examination.—The watery urine was cloudy with pus, and contained red blood corpuscles and albumin. No tubercle bacilli were detected. The Harris segregator revealed normal urine from the left kidney and cloudy urine from the right. The diagnosis before operation was tuberculosis of the kidney or possibly stone.

Operation.—A nephrectomy was done Aug. 12, 1889, at St. Anthony's Hospital. The kidney was markedly tuberculous,

1. This in face of the dictum of Morris that involvement of the bladder is almost a contraindication to nephrectomy.

with cavities and nodules and ulceration of the pelvis. Recovery was uneventful, except that a sinus persisted for nearly a year, its closure being assisted by the use of the electrocautery.

Postoperative History.—The urine soon became clear and normal and has remained so to the present time, a period of seven years. There have been no urinary symptoms of any kind, the patient considering himself in this regard perfectly well. About two years ago a psoas abscess developed on the right side, but disappeared spontaneously.

As a matter of interest merely, a surgeon of standing had made all arrangements to operate on this man for appendicitis, being misled by the location and character of the pain.

CASE 2.—An emaciated boy, aged 10 or 11, with no tuberculous history, had been treated by a surgeon for cystitis for many months. The existence of pain and tenderness along the left ureter and under the ribs called attention, however, to the kidney. There was blood and pus in the urine, although no tubercle bacilli could be found.

Operation.—With a diagnosis of either tuberculosis or stone, a nephrectomy was done Aug. 24, 1899, at St. Anthony's Hospital. The kidney contained a large caseous focus and several smaller foci, together with numerous tubercles and considerable ulceration of the pelvis.

Postoperative History.—Recovery was prompt as regards the wound in the loin, but the trouble in the bladder and ureter persisted for some months. An examination at the end of 2½ years revealed a fat, healthy, strong boy with perfectly clear and normal urine. The boy committed suicide 3½ years after the operation. His condition remained good up to that time. Whether the suicide was in any way connected with the nephrectomy it is impossible for me to say.

CASE 3.—Mr. C., aged 30, had incipient phthisis, which was latent for 11 years. For several months he had been bothered with frequent urination and irritation of the neck of the bladder.

Examination.—There was watery urine, cloudy with pus, and containing tubercle bacilli. Loss of weight and strength had occurred. There was no tenderness or pain over the ureters or in the region of the kidneys. After careful washing of the bladder, the urine collected in a few minutes was found to contain the usual quantity of pus, and hence it was concluded that the trouble lay in one or both kidneys.

Operation.—The use of the Harris segregator demonstrated disease of the right kidney, which was accordingly removed Nov. 10, 1902, at St. Joseph's Hospital. In spite of the absence of local symptoms the disease involved the pyramids in large areas. There was ulceration of the pelvis and a cavity in the parenchyma as large as one's thumb filled with grumous material. There were also numerous isolated tubercles.

Postoperative History.—A sinus persisted in this case for nearly two years, although for the greater part of the time it annoyed the patient but little. He is now perfectly well at the termination of three and three-fourths years, with clear urine and no bladder symptoms whatever. He has gained much in weight and energy. About a year ago, however, he developed tuberculosis of the right testicle, necessitating castration.

CASE 4.—Mrs. S., aged about 30, had lost much flesh and was very sick and weak. As she was unable to speak English, no clear history could be obtained.

Examination.—There was much pus in the urine, but no tubercle bacilli could be found. The bladder was tender and painful and bled easily on introduction of a catheter, which indicated ulceration. A large kidney could be felt in the left loin. An attempt to segregate the urine was unsatisfactory because of pain and hemorrhage.

Operation.—In spite of this, nephrectomy was done on Jan. 30, 1903, at St. Joseph's Hospital, because demanded by extreme suffering and marked sepsis. The diagnosis was stone or tuberculosis. The kidney was fully twice its normal size and filled with pus cavities, caseous masses and tubercles in all stages of degeneration—local disseminated tuberculosis. There was much ulceration of the pelvis. Following the operation no urine was passed and the patient died of uremia on the eighth day. No autopsy could be obtained, but it is fair to presume that but one active kidney had existed.

CASE 5.—Miss Van L., aged about 25; no tuberculous history. She had been afflicted for a year with irritation of the bladder accompanied at times with pain and tenderness along

the left ureter and in the region of the corresponding kidney.

Examination.—There was abundant watery urine, cloudy with pus, containing at times considerable blood. Tubercle bacilli were present in abundance. Segregation gave clear, normal urine from the right side and purulent urine from the left. The woman had been treated for a number of months for simple ulceration of the bladder without improvement.

Operation.—Nephrectomy was done April 21, 1903, at St. Joseph's Hospital. The kidney contained two abscesses, the larger the size of a walnut, filled with watery pus and cheesy masses. Tubercles were scattered about the organ.

Postoperative History.—A sinus persisted for about one year but finally closed. Her general condition improved rapidly and she gained much in energy and weight. The irritability of the bladder improved also, but did not entirely disappear, although it ceased to be a source of much annoyance. The urine at the end of about 18 months was still a trifle cloudy, although much less so than formerly, showing a decided gain in the diseased condition of the bladder. The patient is now apparently perfectly well at the end of 3¼ years.

CASE 6.—Mr. H., aged about 30, had mild form of phthisis. For many months he had experienced severe pain in the right side, perineum and end of the penis. He had lost much flesh and energy and was compelled to urinate very frequently.

Examination.—The watery urine contained but little pus and no tubercle bacilli could be found.

Diagnosis.—Tuberculosis of kidney and prostate.

Operation.—In conjunction with the late Dr. Munn, a nephrectomy was done July 14, 1902, at St. Joseph's Hospital. Several abscesses of the kidneys were found, together with numerous tubercles, although there was no apparent ulceration of the pelvis, thus accounting for the scarcity of pus in the urine. A tuberculous abscess of the prostate was also opened and curetted. The pedicle of the kidney was tied with silk ligatures, which had to be removed from the bottom of the sinus at the end of about nine months, the sinus then closing after remaining open nearly a year. The patient is now, at the end of four years, in excellent health and strength with normal urine and no bladder symptoms.

CASE 7.—Mrs. B., aged about 50, with no tuberculous history, was emaciated and weak. Five years ago she experienced a severe pain along the left ureter. From this she recovered, except occasionally slight pain and tenderness, until several months ago, when irritation and pain began in the bladder, followed by chills and high fever. A large tumor appeared in the left flank, tender and solid.

Examination.—Segregation revealed pus from the left side and clear urine from the right, which later contained a great number of granular and hyaline casts and some albumin. No tubercle bacilli were found.

Operation.—On account of a scanty secretion of urinary solids, together with other evidences of nephritis in the second kidney, it was deemed unwise to give a general anesthetic, so a number of nephritic and perinephritic abscesses were opened under local anesthesia. Much relief, however, was not obtained, so on Sept. 9, 1905, at St. Joseph's Hospital, the kidney was removed under nitrous-oxid anesthesia, the operation lasting seventeen minutes. Owing to the great size, friability, and numerous adhesions of the organ, it was necessary to remove it piecemeal, the pedicle being clamped by forceps which were left *in situ*. The parenchyma was studded with tubercles and small abscesses (local disseminated tuberculosis). There were several large pus cavities outside the kidney capsule. In other words, the process had become extensively perinephritic. Recovery from the operation took place, but the patient died in about three weeks from exhaustion and sepsis.

CASE 8.—Mrs. D., aged about 30, who had been sick for several months, gradually becoming confined to her bed, had no tuberculous history, but considerable loss of flesh.

Examination.—There was a large tumor in the right hypochondriac region extending downward from the liver; tender, but not painful. Temperature was not elevated, and sometimes subnormal. Urine was high-colored and without pus or blood, in fact, normal. Segregation showed an equal secretion from both sides.

The diagnosis was enlargement of gall-bladder.

Operation.—Oct. 17, 1903, at St. Joseph's Hospital, an in-

cision was made through the outer margin of the right rectus and the difficulty located in the right kidney. The suprarenal capsule was transformed into a great leathery mass as large as one's entire hand and filled with tuberculous abscesses and separate tubercles. The kidney itself contained a parenchymatous abscess the size of a walnut, together with many smaller ones. The pelvis and ureters were not involved, which accounted for the clear urine. There was also a perinephritic collection of tuberculous pus. The kidney and suprarenal capsule were removed through the anterior incision, which was then closed, drainage being established through the back. Prompt recovery without a sinus resulted, and the patient is still absolutely well, 2 3/4 years after the operation, with possession of her usual weight and energy.

CASE 9.—Mrs. B., aged 35, with a history of incipient phthisis, for a number of months had suffered with pain in the bladder, especially when urinating. The pain radiated into the region of the appendix. The urine always contained pus, sometimes in large quantities, as if from the rupture of an abscess. Occasionally blood appeared. Pain and tenderness, of which there was considerable at times, were always in the right iliac fossa, rather high up, so that a diagnosis of appendicitis was made by the attending physician, the pus in the urine being supposed to be due to rupture of an abscess into the ureter. At no time were any of the disturbances referred to the kidney, and its involvement was not even suspected. She was referred to me for operation for appendicitis.

Examination.—The use of the Harris segregator revealed pus and blood from the right kidney and normal urine from the left. No tubercle bacilli could be detected. No stone in either ureter or kidney could be seen with the *x*-ray. (Dr. Stover).

The diagnosis was tuberculosis of right kidney with secondary involvement of bladder.

Operation.—A nephrectomy was done at St. Joseph's Hospital March 29, 1905. The kidney exhibited a parenchymatous abscess containing about an ounce of pus and unconnected with the pelvis, together with numerous tubercles and two small caseous foci opening into the pelvis. Immediate relief from symptoms was experienced, together with improvement in health and strength. A sinus persisted which opened and closed at intervals. At the end of eight months there was still a trace of pus in the urine. Now, at the end of 1 1/3 years, the patient is enjoying excellent health and strength and is attending to all of her duties. There are no urinary disturbances. The sinus still opens slightly at intervals, discharging a drop or two of pus.

CASE 10.—A woman, aged about 45, was seen in consultation with Dr. C. K. Fleming. There was no tuberculous history.

Examination.—There was pus and blood in the urine and considerable vesical pain and tenderness. The emaciation of the patient rendered it easy to palpate the tender and enlarged right kidney. Tubercle bacilli were present. Segregation demonstrated that the left kidney was normal in function.

Operation.—A nephrectomy was done by Dr. Fleming at St. Anthony's Hospital, the wound healing without the formation of a sinus. The enlarged kidney was filled with abscesses, caseous foci, and scattered tubercles. The patient gained remarkably in health and flesh, and now at the end of about six years is in excellent condition.

CASE 11.—A man, aged about 35, had a mild form of phthisis.

History.—For more than three years he had suffered much from inflammation of the bladder. The attention of everyone concerned had been so strongly concentrated on this organ that a few vague pains over the ureters and kidneys of both sides were completely overlooked, the patient being able to recall them only after close questioning. Some months previously a surgeon had established a suprapubic fistula of the bladder, without much benefit resulting. Tubercle bacilli could not be found in the urine. A diagnosis of tuberculosis of the kidney was made, and supported by obtaining very cloudy urine shortly after a thorough washing of the bladder.

Operation.—It being impossible either to segregate the urine or catheterize the ureters, it was decided to explore both kidneys, which was accordingly done without difficulty at St.

Joseph's Hospital, May, 1905. Unfortunately, both organs were found in an advanced stage of tuberculous disease, with a number of abscesses manifesting themselves as soft areas on the surface, hence nothing further was attempted. The wounds healed promptly by first intention. In the course of about two months the patient died of exhaustion without relief from any of his symptoms.

CASE 12.—Miss B., aged about 25, gave a history of incipient phthisis.

History.—For two years or more she had been afflicted with cystitis, which for many months had been so severe as to confine her to bed during most of the time. The urine was filled with pus and blood. So much irritation of the bladder existed that the urine had to be passed every few minutes—a condition amounting almost to incontinence. Some time previously an abscess had presented itself in the right loin in connection with the kidney, which was incised by the attending physician, a sinus resulting which continually discharged pus and urine. No tubercle bacilli could be detected after repeated examinations. It had to be assumed that the left kidney was sound, as it was impracticable to use either the segregator or the cystoscope and the patient's condition scarcely permitted operative exploration.

Operation.—A nephrectomy was done, Nov. 13, 1905, the wound slowly healing without the formation of a sinus. The adhesions were so great that it was necessary to shell the kidney from its fibrous capsule. The organ contained tubercular and tuberculous abscesses.

Postoperative History.—At the end of about two months the wound was healed and the patient up and able to retain the urine from one to two hours. In eight months her condition was very satisfactory. She was able to retain her urine for long periods, although a slight irritation of the bladder was still present. Her flesh and strength had been regained and she was able to resume her social and other duties.

CASE 13.—Mr. H., aged 29, had advanced pulmonary tuberculosis, and a tuberculous nodule in the right epididymis.

History.—There was much vesical pain and tenderness and the urine was filled with pus and blood. Kidney symptoms were entirely absent until shortly before he came under observation, when some pain appeared along the left ureter. Segregation showed an abundance of pus from each side, and the idea of operation was discarded. The symptoms, however, rapidly increased, the temperature going as high as 104, accompanied by great suffering in connection with the bladder and left kidney, making the presence of a severe mixed infection certain.

Operation.—On March 21, 1905, a left nephrectomy was done, not with the idea of obtaining a cure, but for the relief of suffering only. The organ was riddled with abscesses and studded with tubercles and caseous foci. Drainage was instituted and a sinus resulted. Relief from the harassing symptoms was marked and the patient remained in comparative comfort until the time of his death from pulmonary disease some four months later.

CASE 14.—Mr. H., aged 18, was seen in consultation with Dr. C. K. Fleming. No tuberculous history. About two years ago, following a friendly wrestling match, blood was passed in the urine, and again some three months later. Gradually pus appeared with severe cystitis, but at no time were there any renal symptoms, and the disease of the kidneys remained unsuspected by his numerous physicians. No tubercle bacilli could be detected after repeated examinations. After irrigation of the bladder the urine obtained in the course of half an hour was found to be very cloudy with pus, thus indicating the involvement of one or both kidneys. Owing to the lesions in the bladder, however, neither the segregator nor the cystoscope could be used to any advantage, even under an anesthetic, hence operative exploration of both kidneys was decided on.

Operation.—This was done Jan. 21, 1906, at Mercy Hospital, by Dr. Fleming and myself. The right kidney proved to be healthy while the left contained several abscesses and a number of scattered tubercles. A nephrectomy was at once done, which proved to be so difficult, on account of a short pedicle, that resection of the last rib had to be resorted to in order to gain sufficient room.

Postoperative History.—At the end of seven months the patient was much improved as regards both bladder and general condition, and although the sinus still persisted it was very small and annoyed him but little. The vesical symptoms had become comparatively mild and the amount of pus in the urine much reduced.

A résumé of these fourteen cases shows seven males and seven females. Ten were in middle or early adult life, when most cases are found; one was 50 years of age; one 45; one 18 and one 10.

There were no operative deaths. One patient died of uremia, eight days after the operation, and one died of exhaustion and sepsis at the end of three weeks. Both of these were desperate cases in the later stages of the disease, and the patients were exhausted by long suffering and protracted sepsis. Had they been operated on earlier the results might have been different. A third patient committed suicide 3½ years after the operation. Up to that time the urinary apparatus had been in perfectly good condition. I have been unable to trace any connection between the operation and the act of self-destruction. A fourth died of pulmonary consumption about four months subsequent to the operation, having been largely relieved of his urinary symptoms, for which purpose alone the nephrectomy was done. A fifth died in two months of exhaustion incident to advanced tuberculosis of both kidneys. In this case a nephrectomy was not done, only an exploratory operation.

This leaves 9 cases living at the present time: One at the end of 7 years; one at the end of 6 years; one at the end of 4 years; one at the end of 3¾ years; one at the end of 3¼ years; one at the end of 2¾ years; one at the end of 1¼ years; one at the end of ¾ of a year; one at the end of ½ a year.

Eight of these patients are well as far as urinary symptoms are concerned, as was also the patient who committed suicide at the end of 3½ years, although all of them had more or less marked bladder symptoms at the time of operating, leading to a diagnosis of tuberculosis of the bladder as well as of the kidney.

One patient operated on half a year ago still has pus in the urine, but the general and local conditions have undergone marked improvement. Seven patients developed fistulas in the loin lasting from a few weeks to a year or more. Such fistulas are tuberculous and arise from the divided end of the infected ureter. Hence, theoretically, it would be wise to remove the entire ureter down to the bladder, as practiced by Kelly and Hunner. Practically, however, this is not usually advisable, as it increases the extent and danger of the operation; which fact is of importance in any nephrectomy, on account of the welfare of the second kidney, and is especially so in patients weakened by tuberculosis of the genito-urinary tract. These fistulas almost always disappear in time, although they often persist for many months. They are not frequently very annoying. It is, nevertheless well to remove as much of the ureter as possible, cauterize its lumen, and fasten the stump in the lower angle of the wound, where it can be treated later, if necessary.

In spite of careful search, no tubercle bacilli could be detected in eleven out of the fourteen cases; this low proportion being due, perhaps, to the search not being sufficiently persistent. Inoculation of animals was not employed. In six patients a history of a mild form of phthisis could be obtained which was more or less latent when the kidney complications developed. In six others there was no such history. In one, severe pulmonary lesions existed. In the remaining case no history was

obtained. In some instances it was only with the greatest difficulty that the patient was made to recall the evidence of a previous involvement of the lung; so that it is, perhaps, fair to assume that others may have had mild forms of tuberculosis which had escaped their memories altogether, especially as most people are glad to forget such occurrences. My own limited experience would lead me to believe that it is in the mild cases of phthisis with a tendency to latency, that kidney involvement is most likely to occur. Or, is it that people with advanced phthisis are not apt to pay much attention to their kidneys?

CONCLUSIONS.

1. Tuberculosis of the urinary tract very often begins in the kidney, attacking the bladder secondarily.
2. It is usually at first unilateral.
3. Medical or climatic treatment is unsatisfactory in most cases.
4. The ideal treatment is early nephrectomy, provided there is one sound kidney.
5. Tuberculosis elsewhere, unless far advanced, is not a contraindication to operation.
6. Tuberculosis of the bladder derived from one kidney is positively benefited by nephrectomy and can seldom be cured without it.
7. The demonstration of tubercle bacilli in the urine often fails.
8. The removal of the ureter is not ordinarily indicated. If sinuses result, they nearly always heal in time.

KERATOSIS OBTURANS.*

G. STERLING RYERSON, M.D., C.M., L.R.C.S. (EDIN.).
Professor of Ophthalmology and Otology, Medical Faculty, University of Toronto.
TORONTO, CAN.

The formation of epithelial plugs of considerable size must be counted among the rare diseases of the ear. In my practice, private and hospital, extending over more than a quarter of a century, I have met with only two cases. The literature of the subject also confirms their rarity. They would appear to be allied in nature to cholesteatomata, described by Mueller and Virchow as pearl tumor, possessing a well marked wall with contents of hornified or epidermized cells arranged in layers like an onion. The same description applies to the tumor described by Habermann as occurring in the mastoid antrum, many examples of which are recorded. In the cases which I report there did not appear to be any middle ear involvement in so far as epithelial growth was concerned, though there was a history of previous suppurative trouble in both. Further, the removal of the growth from the external auditory canal entirely relieved the symptoms. According to Brühl and Politzer desquamative inflammation of the external auditory canal is either idiopathic or the result of chronic hyperemia. Microscopically the epithelial layer is found to be atrophic and the stratum corneum thickened; the latter is covered with successive wavy layers, consisting of large polygonal horny cells of squamous epithelium without nuclei. In places the cuticle shows round-cell infiltration. The hair follicles are dilated and filled with horny cells.

In one of these cases the growth was of many years' duration and was attended by mental symptoms, loss of

memory, difficulty in fixing the attention and following a train of thought, all of which were relieved by the removal of the growth. Ear cough was also present. The other case presented some of the symptoms of acute mastoiditis except that the pain was referred chiefly to the temple and anterior wall of the canal. There was tenderness of the mastoid, but little or no swelling, and an absence of that sickening pain produced by deep steady pressure. In one case the course was exceedingly slow, in the other, acute.

CASE REPORTS.

CASE 1.—History.—J. C., aged 45, farmer, consulted me Oct. 3, 1895, for deafness of long standing. He did not remember when he had heard well with his left ear. Of late there had been some pain, tenderness, and a feeling of weight in the ear.

Examination.—The ear was apparently filled with wax. Hearing: H. R., 20/40; H. L., pressure.

Treatment.—After syringing for some time without much effect, patient was given a solution of soda bicarbonate and instructed to go home, fill the ear, soak it thoroughly, and return next day. He did so and again the ear was syringed to little effect. Peroxid of hydrogen was given with instructions to use it frequently. This and syringing were continued for five days, little coming from the ear save small masses of epithelial scales, when a larger plug appearing to be loose I moved it with forceps.

I continued to do this for three or four days more, when the remains of the drumhead came in view. It was ulcerated, as were the walls of the canal in places. The bony canal was dilated to double its normal size. The parts were irrigated with weak bichlorid solution and swabbed with 2 per cent. solution, nitrate of silver, and healed readily.

The mental symptoms of which he complained, giddiness, loss of memory, difficulty in fixing the attention, and dulness, were completely relieved.

CASE 2.—History.—B. F., aged 36, clerk, had acute suppurative following scarlatina, twenty years ago. He made a good recovery, but from time to time during the intervening years he was subject to acute or subacute attacks of inflammation of the middle ear. On Jan. 11, 1906, he presented himself, complaining of what seemed to be a threatening attack of mastoiditis. He had severe pain in the region of the mastoid, redness, but no considerable swelling. The pain was referred to the middle ear and anterior wall of the external auditory canal rather than to the mastoid itself, and was worse at night. The parts were very sensitive to the touch, but the severe sickening pain produced by deep pressure over the mastoid, common in mastoiditis, was absent.

Examination.—The external auditory canal appeared to be plugged with wax, which syringing did not remove.

Treatment.—Any attempt to remove the plug with forceps and eurette was attended by so much pain that I was forced to desist. Leeching and douching with hot solutions of bichlorid of mercury were ordered. The pain was controlled by ovoids of cocoa butter, each containing 1 gr. of opium. Temperature ranged from 99 to 102, with an evening rise. These symptoms continued for several days and I had about concluded to open the mastoid when the symptoms ameliorated. The following day considerable masses of epithelial scales came away and a loose mass lying in the external auditory canal was removed with the forceps. The walls were dilated and denuded of epithelium in places, as was the drumhead. Under continued douching and local application of nitrate of silver the parts healed. Hearing, H, 2/40.

Apart from the formation of an immense epithelial plug this case is interesting from the presence of symptoms so analogous to mastoiditis that a diagnosis was difficult. The fact that the anterior wall of the canal was swollen and tender as well as the reference of the pain to the middle ear and the absence of swelling of the mastoid, together with the absence of bulging of the wall of the canal, made me hesitate to operate, and the result justified my delay.

* Read in the Section on Laryngology and Otology of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.