attacks of pain are of such frequency as to interfere with the occupation of the patient, or when pyelitis or pyelonephritis has been excited. Stone in the kidney is not inconsistent with a long life and with the enjoyment of a fair measure of health.

XI. TUMORS OF THE KIDNEY.

These are benign and malignant. Of the benign tumors, the most common are the small nodular *fibromata* which occur frequently in the pyramids, the *aberrant adrenals* which Grawitz has described, and occasionally *lipoma*, *angioma*, or *lymphadenoma*. The *adenomata* may be congenital. In one of my cases the kidneys were greatly enlarged, contained small cysts, and numerous adenomatous structures throughout both organs.

Malignant growths—*cancer* or *sarcoma*—may be either primary or secondary. The sarcomata are the most common, either alveolar sarcoma or the remarkable form containing striped muscular fibres—rhabdo-myoma. Carcinoma is less frequent, and is of the encephaloid variety.

Primary cancer—meaning by this, malignant disease—is not uncommon, and the statistics given by some writers do not represent the frequency with which it is met with, at any rate, in this country. Virchow gives the ratio to cancer in other parts as one half of one per cent.

The tumors attain a very large size. In one of my cases the left kidney weighed twelve pounds and almost filled the abdomen. In children they may reach an enormous size. Morris states that in a boy at the Middlesex Hospital the tumor weighed thirty-one pounds. They grow rapidly, are often soft, and hæmorrhage frequently takes place into them. In the sarcomata invasion of the pelvis or of the renal vein is common. The rhabdo-myomas rarely form very large tumors, and death occurs shortly after birth. In one of my cases the child lived to the age of three years and a half. The tumor grew into the renal vein and inferior cava. A detached fragment passed as an embolus into the pulmonary artery, and a portion of it blocked the tricuspid orifice.

Symptoms.—The following are the most important: (1) Hæmaturia. This may be the first indication. The blood is fluid or clotted, and there may be very characteristic moulds of the pelvis of the kidney and of the ureter. It would no doubt be possible for such to form in the hæmaturia from calculus, but I have never met with a case of blood-casts of the pelvis and of the ureter, either alone or together, except in cancer. It is rare indeed that cancer elements may be recognized as in the urine. Of the numerous specimens which I have examined, in not one have I found elements which could be clearly distinguished from the multiform transitional epithelium constantly present in these cases.

(2) Pain is an uncertain symptom. In several of the largest tumors

which have come under my observation there has been no discomfort from beginning to close. When present, it is of a dragging, dull character, situated in the flank and radiating down the thigh. The passage of the clots may cause great pain

(3) Progressive emaciation. The loss of flesh is usually marked and advances rapidly. There may, however, be a very large tumor without emaciation.

Physical Signs.—In almost all instances tumor is present. When small and on the right side, it may be very movable; in some instances, occupying a position in the iliac fossa, it has been mistaken for ovarian tumor. The large growths fill the flank and gradually extend toward the middle line, occupying the right or left half of the abdomen. Inspection may show two or three hemispherical projections corresponding to distended sections of the organ. In children the abdomen may reach an enormous size and the veins are prominent and distended. On bimanual palpation the tumor is felt to occupy the lumbar region and can usually be lifted slightly from its bed; in some cases it is very movable, even when large; in others it is fixed, firm, and solid. The respiratory movements have but slight influence upon it. Rapidly growing renal tumors are soft, and on palpation may give a sense of fluctuation. A point of considerable importance is the fact that the colon crosses the tumor, and can usually be detected without difficulty.

Diagnosis.—In children very large abdominal tumors are either renal or retroperitoneal. The retroperitoneal sarcoma (Lobstein's cancer) is more central, but may attain as large a size. If the case is seen only toward the end, a differential diagnosis may be impossible; but as a rule the sarcoma is less movable. It is to be remembered that these tumors may invade the kidney. On the left side an enlarged spleen is readily distinguished, as the edge is very distinct and the notch or notches well marked; it descends during respiration, and the colon lies behind, not in front of it. On the right side growths of the liver are occasionally confounded with renal tumors; but such instances are rare, and there can usually be detected a zone of resonance between the upper margin of the renal tumor and the ribs. Late in the disease, however, this is not possible, for the renal tumor is in close union with the liver.

A malignant growth in a movable kidney may be very deceptive and may simulate cancer of the ovary or fibroid of the uterus. The great mobility upward of the renal growth and the negative result of examination of the pelvic viscera are the reliable points.

Medicinal treatment is of no avail. When the growth is small and the patient in good condition removal of the organ may be undertaken, but the percentage of cases of recovery is very small.

XII. CYSTIC DISEASE OF THE KIDNEY.

The following varieties of cysts are met with:

(1) The small cysts, already described in connection with the chronic nephritis, which result from dilatation of obstructed tubules or of Bowman's capsules.

(2) Solitary cysts, ranging in size from a marble to an orange, or even larger, are occasionally found in kidneys which present no other changes. They never give rise to symptoms, though, in exceptional cases, they may form tumors of considerable size. They, too, in all probability, result from obstruction.

(3) The congenital cystic kidneys. In this remarkable condition the kidneys are represented by a conglomeration of cysts, varying in size from a pea to a marble. The organs are greatly enlarged, and together may weigh six or more pounds. In the fœtus they may attain a size sufficient to impede labor. Little or no renal tissue may be noticeable, although in microscopical sections it is seen that a considerable amount remains in the interspaces. The cysts contain a clear or turbid fluid, sometimes reddish brown or even blackish in color, and may be of a colloidal consistence. Albumen, blood crystals, cholesterin, with triple phosphates and fat drops are found in the contents. Urea and uric acid are rarely present. The cysts are lined by a flattened epithelium. It is not yet accurately known how these cysts originate. That it is a defect in development rather than a pathological change is suggested by the fact that it is often in the embryo associated with other anomalies, particularly imperforate anus. Both Shattock and Bland Sutton, who have studied the question carefully, believe that the anomaly of development is in the failure of complete differentiation of the Wolffian bodies, which are, as it were, mixed with the kidneys and give rise to the cysts.

In a large majority of the cases death occurs, either *in utero* or shortly after birth; but instances are met with at all ages up to fifty or sixty, and I see no reason to suppose that these are not instances of persistence of the congenital form.

In the adult the tumors may be felt in the lumbar region as large rounded masses.

The *symptoms* are those of chronic interstitial nephritis. Many of the cases have presented no indications whatever until a sudden attack of uræmia; others have died of heart-failure. A rare termination in a case at the University Hospital, Philadelphia, was the rupture of one of the cysts and the production of a perinephritic abscess. The cardio-vascular changes induced are similar to those of interstitial nephritis. The left ventricle is hypertrophied and the arterial tension is greatly increased. The condition is compatible with excellent health. The dangers are those associated with chronic Bright's disease. It is important to remember that the conglomerate cystic kidney is almost invariably bilateral. One kidney may be somewhat larger and more cystic than the other.

The diagnosis can sometimes be made. Great enlargement of both organs, with hypertrophy of the left heart and increased arterial tension, would suggest the condition.

Operative interference is not justifiable. I know an instance in which one kidney was removed and the patient died within twenty-four hours.

(4) Occasionally the kidneys and liver present numerous small cysts scattered through the substance. The spleen also may be involved. The cysts in the kidney are small, and neither so numerous nor so thickly set as in the conglomerate form, though in these cases the condition is probably the result of some congenital defect. There are cases, however, in which the kidneys are very large. It is more common in the lower animals than in man. I have seen several instances of it in the hog; in one case the liver weighed forty pounds, and was converted into a mass of simple cysts. The kidneys were less involved. Charles Kennedy * states that he has found references to twelve cases of combined cystic disease of the liver and kidneys.

The echinococcus cysts will be spoken of under the section on parasites.

XIII. PERINEPHRIC ABSCESS.

Suppuration in the connective tissue about the kidney may follow (1) blows and injuries; (2) the extension of inflammation from the pelvis of the kidney, the kidney itself, or the ureters; (3) perforation of the bowel, most commonly the appendix, in some instances the colon; (4) extension of suppuration from the spine, as in caries, or from the pleura, as in empyema; (5) as a sequel of the fevers, particularly in children.

In the post-mortem examination of a case of perinephric abscess the kidney is found surrounded by pus, particularly at the posterior part, though the pus may lie altogether in front, between the kidney and the peritonæum. Usually the abscess cavity is large and extensive. The pus is often offensive and may have a distinctly fæcal odor from contact with the large bowel. It may burrow in various directions and may burst into the pleura and be discharged through the lungs. A more frequent direction is down the psoas muscle, when it appears in the groin, or it may pass along the iliacus fascia and appear at Poupart's ligament. It may perforate the bowel or rupture into the peritonæum, and in some instances it has penetrated the bladder or vagina.

Post mortem we occasionally find a condition of chronic perinephritis in which the fatty capsule of the kidney is extremely firm, with numer-

* Laboratory Reports of the Royal College of Physicians, Edinburgh, vol. iii.

ous bands of fibrous tissue, and is stripped off from the proper capsule with the greatest difficulty. Such a condition probably produces no symptoms.

Symptoms.—There may be intense pain, aggravated by pressure, in the lumbar region. In other instances, the onset is insidious; there is no pain in the renal region, but on the first examination signs of deep-seated suppuration may be detected. On the affected side there is usually pain, which may be referred to the neighborhood of the hip-joint or radiate down the thigh and be associated with retraction of the testis. Sometimes the pain is referred even to the knee-joint, as in hip-disease. The patient lies with the thigh flexed, so as to relax the psoas muscle, and in walking throws, as far as possible, the weight on the opposite leg. According to Gibney, the patient keeps the spine immobile, assumes a stooping posture in walking, and has great difficulty in voluntarily adducting the thigh.

There may be pus in the urine if the disease has extended from the pelvis or the kidney, but in other forms the urine is clear. When pus has formed there are usually chills with irregular fever and sweats. On examination, deep-seated induration is felt between the last rib and the crest of the ilium. Bimanual palpation may reveal a distinct tumor mass. Œdema or puffiness of the skin is frequently present.

The diagnosis of perinephric abscess is usually easy, and in any case when doubt exists the aspirator needle should be used. We cannot always differentiate the primary forms from those due to perforation of the kidney or of the bowel. This, however, makes but little difference, for the treatment is identical. It is usually possible by the history and examination to exclude disease of the vertebra. In children the condition is often mistaken for disease of the hip-joint, but the pain is higher, and there is an entire absence of fulness and tenderness over the hip-joint itself.

From whatever cause produced, the indications for treatment are identical—early, free, and permanent drainage.

SECTION VIII.

DISEASES OF THE NERVOUS SYSTEM.

I. DISEASES OF THE NERVES.

I. NEURITIS (*Inflammation of the Nerve Fibres*).

Neuritis may be *localized* in a single nerve, or *general*, involving a large number of nerves, in which case it is usually known as *multiple neuritis* or *polyneuritis*.

Etiology.—*Localized neuritis* arises from (*a*) cold, which is a very frequent cause, as, for example, in the facial nerve. This is sometimes known as rheumatic neuritis. (*b*) Traumatism—wounds, blows, direct pressure on the nerves, the tearing and stretching which follow a dislocation or a fracture, and the hypodermic injection of ether. Under this section come also the professional palsies, due to pressure in the exercise of certain occupations. (*c*) Extension of inflammation from neighboring parts, as in a neuritis of the facial nerve due to caries in the temporal bone, or in that met with in syphilitic disease of the bones, disease of the joints, and occasionally in tumors.

Multiple neuritis has a very complex etiology, the causes of which may be classified as follows: (*a*) The poisons of infectious diseases, as in leprosy, diphtheria, typhoid fever, small-pox, scarlet fever, and occasionally in other forms; (*b*) the organic poisons, comprising the diffusible stimulants, such as alcohol and ether, bisulphide of carbon, and naphtha, and the metallic bodies, such as lead, arsenic, and mercury; (*c*) cachectic conditions, such as occur in anæmia, cancer, tuberculosis, or marasmus from any cause; (*d*) the endemic neuritis or beri-beri; and (*e*) lastly, there are cases in which none of these factors prevail, but the disease sets in suddenly after overexertion or exposure to cold.

Morbid Anatomy.—In neuritis due to the extension of inflammation the nerve is usually swollen, infiltrated, and red in color. The inflammation may be chiefly perineural or it may pass into the deeper portion—*interstitial* neuritis—in which form there is an accumulation of lymphoid elements between the nerve bundles. The nerve fibres themselves may not appear involved, but there is an increase in the nuclei of