

of the peritoneum and of the other abdominal viscera, (4) prolapse of the kidney, if the wound is extensive.

Treatment.—The treatment is much the same as that of rupture, except that exploration of the wound for the purpose of cleansing it, and exploratory abdominal section to insure the safety of the other viscera are more often necessary.

Gunshot Wounds.—Although the recorded cases of gunshot wounds of the kidney show a very high mortality—viz., 59 deaths among 85 cases in the War of the Rebellion, and 8 deaths among 15 cases in the Franco-Prussian War—it is evident that this death-rate is due to associated injuries. (Thus Edler¹ collected 20 uncomplicated cases with 5 deaths, and 18 complicated cases with 15 deaths.) Hence, as Küster remarks, “the danger of a gunshot wound of the kidney increases with the velocity of the bullet.”

The only special features of these wounds are (1) the explosive effect of high-velocity projectiles—similar to that observed in the other semisolid viscera—(2) the advantage of employing the X-rays to locate the bullet in case its extraction is desirable.

ANEURYSM OF THE RENAL ARTERY

Morris has collected 19 instances of aneurysm of the renal artery, of which 12 were traumatic in origin. He calls attention to this very rare condition because, apparently, it is always fatal (if of any size) unless the patient submits to operation.

The *symptoms* are tumour, pain, and hematuria. It is remarkable that pulsation is rarely detected. Morris detected a loud systolic bruit in his case, but no thrill. The *diagnosis* is made by nephrotomy.

The *treatment* is operative. The aneurysmal sac should be disturbed as little as possible until the pedicle is secured. Albert, Hahn, and Keen have operated successfully; Morris unsuccessfully. A transperitoneal operation presents a better field for securing the renal vessels than does the lumbar route.

¹ Arch. f. klin. Chir., 1887, xxxiv, 379.

CHAPTER XXXVI

PERINEPHRITIC EXTRAVASATIONS AND INFLAMMATIONS

EXTRAVASATION

THE extravasation of feces from the intestine or of air from the lung or bowel into the perirenal tissues is an unimportant phenomenon sometimes associated with grave visceral lesions.

Effusions of urine and blood are more frequent, and, since the source of the blood is usually the kidney, they often occur together.

The extravasation consists of blood alone if it results from an injury to the renal artery or to the renal parenchyma without affecting the pelvis or the ureter. (Bilateral retroperitoneal hematoma may also result from rupture of an aortic aneurysm.) If both the kidney and its pelvis are torn a *urohematoma* results, the blood preponderating at first (unless the kidney is hydronephrotic), the urine later; or rather, a lumbar tumour appearing immediately after an injury to the loin, and rapidly increasing in size during the first twenty-four hours is a hematoma; while urinary extravasation (unless preceded by hematoma) produces a slowly growing tumour, which may not be noticed until some weeks after the infliction of the injury. Occasionally the lesion in the pelvis or ureter is so small, and the escape of urine so gradual, that the cellular tissue forms a tense sac about the fluid. The name *traumatic hydronephrosis* has been given to this condition, in spite of the fact that there is no true dilatation of the renal pelvis. True traumatic hydronephrosis results from cicatricial stricture of an injured ureter, and is excessively rare. Sollers (Rattier¹) and Pye Smith (Morris) have reported authentic cases. In Mannasse's case (Rattier, Obs. XXIV) a pseudo-hydronephrosis appeared eighteen months after injury.

Course.—The effusion spreads as long as hemorrhage or urinary leakage continues. As the perineal fascia is usually uninjured,

¹ Des épanchements urinaires d'origine rénale, Paris, 1899, p. 17.

the extravasation forms an elastic swelling filling the loin. Thence it may extend downward to the inguinal region, the pelvis and thigh; but this is exceptional.

If the extravasation is hemorrhagic, it is likely to remain aseptic and to become a blood cyst, with grumous or serous contents if it is too large to be absorbed. But when the tumour is a urohematoma, as is usually the case, the danger of infection is great, not so much from the urine itself—since this fluid is habitually aseptic—but by the bacteria habitually passed through the urinary channels without finding any lodgment, but which find ideal conditions for their proliferation in so excellent a culture medium as is formed by the mixed blood and urine. Suppuration with secondary perinephritic abscess is the usual outcome.

Treatment.—The proper treatment of perinephritic extravasation, be it hematoma or urohematoma, is incision, exploration, and drainage, for the purpose of (a) preventing suppuration, (b) suturing large rents in the kidney or its pelvis, and (c) removing any ureteral kink, valve, obstruction, or stricture in order to re-establish the urinary flow through the natural passages. Therefore it is especially important to investigate the condition of the pelvis and ureter (p. 640).

PERINEPHRITIS AND PERINEPHRITIC ABSCESS

Perinephritis is an inflammation of the fatty fibrous envelope of the kidney. It is encountered under three forms: (1) Suppurating perinephritis, (2) fibro-lipomatous perinephritis, and (3) sclerotic perinephritis. The two latter varieties may be dismissed with a word.

FIBRO-LIPOMATOUS AND SCLEROTIC PERINEPHRITIS

Each of these allied processes is a protective inflammation of the perirenal fat secondary to suppurative inflammation of the kidney itself. When the fatty capsule is found contracted and condensed, as it were, into a solid mass of firm fat bound to the kidney by dense bands of fibrous tissue, the inflammation is termed fibro-lipomatous; when the fat is entirely replaced by fibrous tissue the term sclerotic is used. In each instance the reaction in the perinephritic tissue is a chronic fibrosis aroused by long-continued suppuration within the kidney. If the renal inflammation is chiefly confined to the pelvis, the perirenal reaction manifests itself by the accumulation of dense masses of fat and fibrous tissue about that part of the organ. If there is a considerable inflammation of the renal parenchyma, the whole kidney is enveloped in the fibro-lipomatous mass, which may be sufficiently thick to produce a considerable tumour (Fig. 139).

SUPPURATING PERINEPHRITIS—PERINEPHRITIC ABSCESS

Perinephritic abscess may be primary or secondary, simple or tubercular.

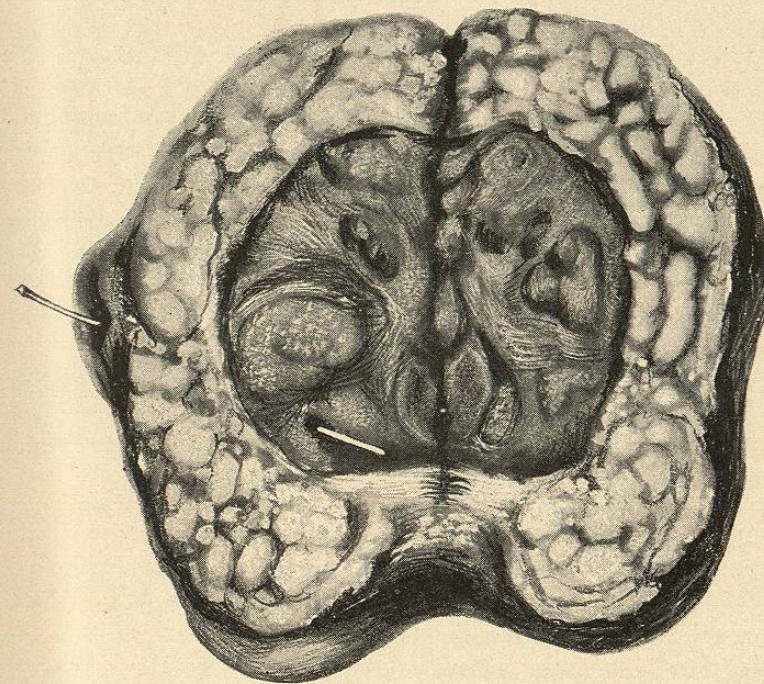


FIG. 139.—PERINEPHRITIS (MORRIS).
Dense fibro-lipomatous perinephritis due to intrarenal suppuration. The probe shows a fistula, through which the suppuration has extended to the perirenal tissue in spite of the protective inflammation.

Etiology.—The causes of perirenal abscess may be tabulated as follows:

Primary abscess—

Traumatic—

- Infection from the kidney.
- Infection from the wound.

Spontaneous—

- Attributed to a sprain, a chill,
or to general debility.

Secondary abscess—

Of renal origin—

- Calculous or tubercular pyelo-nephritis.
- Pyonephrosis.
- Suppurative nephritis.

From other viscera—

Appendix.

Liver.

Gall-bladder.

Pelvic organs.

Vertebrae (often tubercular).

I have encountered traumatic abscess, abscess due to calculous and to tubercular pyelo-nephritis, abscess arising from an acute appendicitis, abscess secondary to cystotomy, and spontaneous tubercular abscess without evident connection with any bone or viscus.

Symptoms.—The *onset* of suppuration is usually insidious, marked by irregular fever (rarely by a chill), tenderness over the kidney, a stiffness and tendency to favour the affected side in walking or sitting, and restricted extension of the thigh, without obstruction to flexion. Gibney has indicated the possibility of mistaking beginning perinephritis for hip disease. Even when perinephritis succeeds injury the history may be so obscure as to be misleading. A careful physical examination, however, will show that the seat of inflammation is the loin, and not the spine or hip.

The *course* of the disease is that of a retroperitoneal lumbar abscess. Resolution without the formation of an abscess is rare. The irregular fever usually continues (it is often mistaken for typhoid), the pain and tenderness in the loin, the forced flexion of the thigh grow more marked, and a tumour appears in the loin.

This tumour is quite characteristic. The whole loin is perceptibly bulged outward and backward, with less protuberance in front than is the case when the tumour is intrarenal. Moreover, the tumour formed by perirenal abscess is quite immobile. When large, fluctuation can be elicited, and edema of the overlying skin may appear.

The *termination* of the disease, unless subjected to operation, is death by septicemia or by rupture. Küster records 34 cases of rupture distributed as follows:

Pleura and bronchi.....	18 cases.
Intestine (colon).....	11 "
Peritoneum.....	2 "
Bladder, or bladder and vagina.....	3 "

Morris says: "Compared with the frequency with which perinephritic abscesses perforate the colon, the pleura, or the lung, the other forms of spontaneous opening are rare. Probably it is not an exaggeration to say that of every 12 cases which pursue their own course, 4 or 5 open into the pleural cavity or the lung." External rupture through the loin is rare.

Diagnosis.—While the diagnosis may be difficult in the early stages the presence of leukocytosis, the absence of malarial organisms from the blood, and a negative Widal reaction, will show that the fever is due to suppuration somewhere; and tenderness in the loin suggests the site of suppuration. There are no urinary signs essentially connected with this malady.

In the later stages the tumour is pathognomonic. The one tubercular case I have seen was unmistakable, although the only subjective symptom was an inability to cross the corresponding leg over the other without lifting it with the hand. Yet a mere inspection of the flank showed the presence of the abscess, which, when incised, yielded a litre of pus.

Prognosis.—Spontaneous cure by resolution, encapsulation, or rupture is very rare, and is never to be expected.

Early operation gives good results. The longer the operation is delayed the worse the prognosis.

Treatment.—The only treatment for suppurating perinephritis is incision and drainage. Even when the case is diagnosed so early that the presence of pus is doubtful, an exploratory incision—although nothing be found—offers a better prospect of cure than any expectant treatment. Rupture of the abscess into the intestine is no contra-indication to operation; it is rather an incentive, since the abscess drains but poorly and the admixture of feces with its contents is calculated to add fuel to the inflammation.

In operating, the primary object is to secure free drainage. The usual oblique incision insures this and permits thorough exploration. As soon as the abscess is opened, and while it is being copiously irrigated with salt solution, the finger is introduced, and with it the cavity is carefully explored for the purpose of discovering whether the abscess arises from the kidney, the appendix, or some other organ. Bimanual palpation may reveal a diseased kidney; but the question as to whether, in such event, nephrotomy should be performed immediately, or delayed until the perirenal suppuration is reduced, is one that must be decided upon the merits of the case, especially in reference to the condition of the patient, the severity of the infection, the amount of intrarenal suppuration, and the condition of the opposite kidney. The possibility of associated empyema should not be forgotten. After-treatment consists in prolonged drainage.