ciently to account for the symptoms, the existence of contracture of the neck of the bladder may be affirmed.

Prognosis.—The outlook in these cases is not good. When there is retention of urine recovery may not be expected spontaneously nor from topical applications. When there is no retention the cases are often equally intractable, although, occasionally, one is cured by the treatment of the posterior urethritis, whether by curing the surface inflammation or by causing the resorption of the deeper inflammatory tissue, I cannot say.

Treatment.—The indications for treatment are perfectly clean-cut. If the case affects the chronic urethritis type, it should be treated locally, until the patient's endurance gives out, in the hope that it may perhaps be cured thus. But if these means fail, or if the disease is of the prostatic type, it should be submitted to the knife. The only exception to this rule occurs in the stone cases. If these are submitted to litholapaxy, the bruising of the neck of the bladder by the large tubes, though this will cause a pretty active post-operative reaction lasting some weeks, may so tear the contracted bladder neck that a cure will result in the long run; yet such an uncertain and brutal treatment could not be advocated.

Operative Treatment.—Although I have kept no records of operations for contracture of the neck of the bladder, I have found in my case books 15 operations for contracture without a death. Among 8 other operative cases in which the contracture complicated a tight stricture there were 2 deaths. Although I have operated for contracture much more frequently than these figures show, I have never had a post-operative death. Among urethrotomies for stricture the mortality is entirely attributable to the stricture, and does not concern the contracted neck of the bladder.

My method of operating has always been to perform perineal cystotomy (p. 457) and to tear through the neck of the bladder with the finger, or, if this proved inefficient or impossible, to cut down the rigid neck obliquely to one side, just deep enough to allow the finger free access to the bladder. I prefer a lateral to a median cut, believing it less likely than the median incision to cause incontinence or to divide both ejaculatory ducts. To make the cut I now use the Chetwood galvano-cautery instead of a blunt-pointed straight bistoury, for the knife sometimes causes alarming bleeding, the cautery practically none. The great danger after this operation is incontinence of urine. If every fibre of the muscle at the bladder neck is divided incontinence may be complete and permanent, and I have known this unfortunate result to occur in two cases. Yet it is necessary to divide the contracture sufficiently to overcome the symptoms,

notably the retention. A solution of this difficulty will, I believe, be found in Chetwood's operation. The cautery must be applied very moderately. A single incision $1\frac{1}{2}$ cm. long is ample to divide the tighter fibres and to relieve the residuum.

The after-treatment of this operation depends upon whether the knife or the cautery has been employed. If the former, a perineal tube must be inserted and retained for at least a week, preferably two weeks, in order to force the wound to heal by granulation. The use of the cautery obviates this necessity, however, and after employing it I believe the tube need only be left in place for four days. The bladder must be washed daily for a few weeks.

The complications of the operation are hemorrhage and incontinence of urine. After cutting down the neck of the bladder there is often incessant bleeding for two or three days. I have not known this hemorrhage to be fatal, but it is often alarming. After burning operations it does not occur, and this constitutes one of the notable advantages of burning over cutting. On the other hand, incontinence may occur after either operation. Even after the most skilful manipulation it is not uncommon for the patient to dribble a little for several months after the operation; but permanent incontinence may be avoided by conservative cutting. It is true that if the patient is cut too sparingly the operation may have to be repeated; but this is far preferable to an incontinence which neither time nor art will cure.

MALIGNANT DISEASE OF THE PROSTATE

Malignant disease of the prostate is almost always primary. Extension of a vesical cancer to the prostate is extremely rare, while extension of a prostatic growth to the bladder is very common. Sarcoma occurs in youth, carcinoma in old age. Either form is rare, although such statistics as Tauchon's, which show among 8,289 cases of cancer only 5 cases affecting the prostate, certainly underestimate the frequency of the disease. Engelbach in 1888 collected 96 reported cases of malignant disease of the prostate. Nine occurred before the tenth year. There were only 18 between the tenth and the fiftieth year; while between the fiftieth and the eightieth were 69 cases. Ten carcinomata occur for every one sarcoma.

Morbid Anatomy.—*Sarcoma* may be round or spindle-celled; rarely it is an adenosarcoma, lymphosarcoma, or myxosarcoma.

Carcinoma is usually medullary or adenocarcinoma. The connection between carcinoma and prostatic hypertrophy has long been disputed. Certain it is that the hypertrophied prostate very rarely takes on malignant change, and equally certain is it that carcinoma

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may occur in a gland to all appearances unaffected by hypertrophy. Yet many observers have attempted to prove the epithelial proliferation of hypertrophy a fertile soil for malignant changes. Thus Albarran and Hallé[1] examined 100 hypertrophied prostates, and among these found 14 that showed small areas of typical cancerous tissue.

Neoplasms of the prostate may run their whole course, extending to the neighbouring organs, causing metastases and death without involving the entire gland, though it is more common for the gland to be entirely involved early in the disease. The growth spreads rapidly by extension to the bladder wall and the prostatic urethra. Rectum, vesicles, ureter, and anterior urethra are sometimes invaded. The retroperitoneal and mesenteric glands are involved early, the inguinal glands later. Bone metastases are especially common. Von Frisch mentions von Recklinghausen's 5 cases of insignificant primary prostatic cancer with extensive secondary bone involvement.

Symptoms.—Unfortunately, cancer of the prostate is rarely recognised until the disease is well advanced. Indeed, von Recklinghausen's cases show that the primary prostatic disease may be overlooked even at a time when the secondary growths have assumed alarming proportions. Two other facts tend to confuse the diagnosis. In the first place, the prostate is commonly attacked by malignant disease late in life, and at first causes slight symptoms which the patient refers to advancing age or to hypertrophy of the prostate, if he possesses the dangerous " little knowledge," and which may deceive even the surgeon. In the second place, the progress of the disease is often nothing less than furious. Before the patient realizes he is sick the growth fairly fills the pelvis. It is this characteristic that has earned for the disease Guyon's title of *carcinose prostato-pelvienne.*

In children the initial symptom of the disease is most often an obstruction to urination; but adults commonly complain of severe *pain* long before there is any urinary difficulty. This pain has several striking characteristics. Though it may at first occur only during urination, it soon becomes continuous. The pain is quite severe. It is increased by urination and defecation, but never ceases entirely. It is concentrated in the perineum or the rectum, and thence radiates to the genitals, the hypogastrium, and the loins, in which last place it may be especially severe. It also causes reflex sciatica, and bilateral sciatica is especially suggestive of cancer of the prostate. These

[1] Guyon's Annales, 1900, xviii, 113, 225.

painful symptoms are characteristic of the early stages of the disease, and, apparently, are due to tension of the dense prostatic capsule. After this has been broken through the typical pain ceases, and there is left only dysuria from such retention or inflammation as may be present.

Slight *hematuria*, either at the beginning or at the end of urination, occurs in one quarter of the cases. In the later stages of the disease, when urethra and bladder are both the seat of malignant fungous ulcerations, copious hematuria is common. *Obstructive and inflammatory symptoms* are quite those of hypertrophy of the prostate; and towards the end constant straining urination, with foul bloody urine, is the most distressing symptom. Edema of the extremities and genitals, and cancerous cachexia are encountered in the terminal stages of the disease.

The growth commonly progresses with the greatest rapidity, and the patient usually dies within a year of the first appearance of symptoms. But, exceptionally, the new growth remains stationary or progresses but slowly for many months. Fenwick[1] makes a special class of these and compares them with mammary scirrhus. They may last for as long as three years.

Diagnosis.—The symptoms suggestive of cancer of the prostate are encountered only when the disease is sufficiently advanced to be distinguished by rectal examination, and upon this the diagnosis rests. In a pronounced case the cachectic condition, the dysuria, the foul, bloody urine, and the enlarged inguinal glands only require a cursory rectal examination to confirm the diagnosis. The finger, as soon as it passes the internal sphincter, abuts upon an enormous hard, nodular tumour on the anterior rectal wall. Perhaps the rectum itself is ulcerated.

But in the beginning cases the diagnosis may be no easy matter. The growth, as felt from the rectum, assumes one of two forms: it is either a circumscribed nodule in one of the lateral lobes, remarkably hard, though not necessarily prominent, or it is a less hard, irregular infiltration of the whole gland, which cannot be distinguished from simple hypertrophy, except, perhaps, by the characteristic pain, until it has attained an ominous size, given rise to secondary glandular enlargements in the groin and along the iliac vessels, and begun to invade the bladder and the periprostatic tissues.

The differential diagnosis between carcinoma and hypertrophy is often impossible in the earlier stages of the disease (see above). Cancer of the base of the bladder may be distinguished from cancer

[1] Edinb. Med. J., 1899, vi, 16.

of the prostate by delineating the normal prostate below the vesical growth, by observation of the urethral length, which is not increased unless the cancer is prostatic, and by cystoscopy, which shows an intravesical growth, but commonly fails to make out a prostatic one.

Treatment.—Extirpation of the prostate has been done 8 times (von Frisch). Five of the patients died within two months, 2 survived nine months (Czerny, Verhoogen), and 1 fourteen months (Billroth); but all these died of recurrence. Such a record discourages the hope of radical cure by the knife. Indeed, the well-known rapidity with which secondary glandular involvement takes place precludes expectation of any very brilliant results in this direction. Yet partial prostatectomy has given results which, if not brilliant, are at least slightly encouraging. Two of von Frisch's cases (middle lobe) remained well one year, and a case operated upon by Socin for sarcoma of the right lobe remained well two years.

Palliative treatment is almost equally futile. In the early stages, sedatives, tonics, and the catheter (if there is retention) may relieve the symptoms somewhat. Later, opium, suprapubic cystotomy, as for cancer of the bladder (p. 422), and colostomy, as soon as the rectum becomes ulcerated or obstructed, are the chief elements of palliative treatment.

CHAPTER XXI

THE BLADDER: ANATOMY, PHYSIOLOGY, EXAMINATION— EXSTROPHY OF THE BLADDER

ANATOMY

The bladder is a muscular sac lying, in the male, between the rectum and the pubes when empty, and distending, when full, into an oval bag occupying more or less of the hypogastrium (Fig. 86). Its position is fixed below by the urethra, by the pelvic fascia, which, after lining the cavity of the true pelvis, is reflected upward and lost on the bladder and rectum (as pubo-prostatic and inferior vesical ligaments), and by the recto-vesical fascia, which binds the prostate and the neck of the bladder to the rectum. The muscular tissue of the organ is covered on the outside by peritoneum, on the inside by mucous membrane. Above and on the sides the peritoneum covers the bladder, but is attached loosely, especially at the base, so as to offer no obstacle to any change in shape or position of the viscus.

A knowledge of the peritoneal reflections upon the bladder is essential to a correct understanding of the operations of epicystotomy and suprapubic aspiration. When the bladder is empty it lies contracted behind the pubes; the peritoneum leaves the abdominal walls at the symphysis, and passes at once to the bladder, over which it is spread, and thence reflected upon the rectum from the base of the bladder, so that, when the latter is absolutely or even partially empty no trocar or aspirating needle may reach it from the anterior abdominal wall without traversing the peritoneal cavity.

Very different, however, is the condition of the viscus when distended. Then, as its cavity fills up, the peritoneum is carried with it. In this way the distended bladder carries up the peritoneum in front, so that in extreme retention a distance of 2 to 5 cm., or even more, above the symphysis becomes bare of peritoneum. Hence the election of the region immediately above the pubes for aspiration and the necessity of filling the bladder before attempting suprapubic