

remain in bladder. In so-called lower lesion (below the 11th thoracic vertebra) are the nervous pathways in sacral medulla eliminated and so are the afferent pathways leading from urinary bladder, and the medullar centre with efferent pathways.

In the state of automatism is the urinary bladder atonic. Irregular contractions of m. detrusor single fibres appear, induced by stimuli arising from intramural ganglia. The urinary bladder can be evacuated only by use of abdominal press and the volume of residual urine exceeds 300 ml.

4.17 Tumors of urinary tract

Benign renal tumors originate in parenchyma and are usually small. The adenomas reach 5 to 10 mm in diameter. They can cause recurrent haematuria without pains. Malignant transformation of adenomas is exceptional. The hamartomas can be uni- or bilateral. They contain vessels, adipose tissue, smooth muscle. Benign tumors may arise also from capillaries adjoining the juxta-glomerular apparatus. They are producing renin.

Malignant renal tumor (adenocarcinoma, hypernephroma) becomes clinically manifest by haematuria, lumbar pains and palpable resistance. The most important symptom is the haematuria. Tumor penetrates the renal capsule and renal veins, therefore haematuria can be very dramatical. It may spread into the peritoneal lymphatic tissue and liver. Metastases are found mainly in lungs, brain and bones.

Intermittent fever may occur without overt infection. Anaemia is present in about 50 per cent of patients. Occurrence of polyglobulia is rather exceptional. It is induced by erythropoietin produced in tumor cells. It is very important to realise that the renal carcinomas can produce many various hormones or hormone-like substances. It is frequently the parathyroidal hormone, prolactin, prostaglandins, gonadotropins and glucocorticoids. Thus, it is not surprising, when a condition develops with dominant Cushing's syndrome.

In kidney arterio-venous fistulae may arise, which can create conditions for heart failure with increased minute cardiac volume. Tumor may occlude v. cava; induce severe liver deterioration and changes in blood flow through the splanchnic region.

In children occurs malignant nephroblastoma (Wilms' tumor). It is composed of various types of cells: epithelial, muscle-, cartilage-, bone cells. It grows to large dimensions and occurs bilaterally. The most frequent symptoms are haematuria, pains, fever and hypertension.

Except for kidneys, tumors of urinary tract can arise from renal pelves, ureters and urinary bladder. Tumors of the urinary bladder prevail. The tumors of renal pelvis and ureters use to be accompanied with renal colics. The carcinomas of urinary bladder are manifested by painless haematuria, nycturia and sacral pains.

Carcinoma of prostata can stay long time asymptomatic. Its incidence raises. The prognosis is favorable if the extent of the tumor is small. This type of tumor penetrates later the lymphatic nodes, bones and lungs.

Benign hypertrophy of prostata can lead to alteration due to partial obstruction of urinary collecting system.