1 Anatomy and Pathophysiology of the Prostate Gland

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Introduction

The origin of the term “prostate” was originally derived from the Greek prohistani (to stand in front of) and has been attributed to Herophilus of Alexandria, who used the expression in 335 B.C. to describe the organ located “in front of” the urinary bladder. However, while the existence of the prostate has been recognised for over 2300 years, the gland’s anatomy, physiology and pathology has been described in detail only within the past six decades. Recently there has been a flurry of interest and activity in relation to the three major prostatic diseases: benign prostatic hyperplasia (BPH), carcinoma of the prostate and prostatitis. This is partly because demographic changes have led to an ever-increasing proportion of men attaining an age at which they are especially susceptible to these disorders, and because of the introduction of new therapies for these diseases. Central to the understanding of both benign and malignant prostatic pathology is comprehension of the zonal anatomy. This chapter relates differences in zonal anatomy to the various pathological processes which frequently affect this gland.

Zonal Anatomy

The anatomy of the prostate has long been a subject of controversy. Lowsley’s (1912) early descriptions of the embryology of the prostate suggested that the human prostate follows a lobar pattern of development similar to that of other mammals; however in humans the dorsal, ventral and lateral lobes of the foetal prostate coalesce in the adult to form a relatively homogeneous structure. Subsequent studies by McNeal (1968) revealed that the lack of anatomically distinct lobes in the human gland is actually the result of an alternative form of architecture. These studies used sagittal, parasagittal and coronal sections of the prostate instead of simply the conventional transverse plane. McNeal (1968) described three anatomical zones: the peripheral zone, transition zone and central zone (Fig. 1.1). The
Fig. 1.1. Longitudinal (a) and transverse (b) sections through the prostate showing central zone (CZ), peripheral zone (PZ) and transition zone (TZ). bn, bladder neck; C, coronal plane; E, ejaculatory ducts; NV, neurovascular bundle; OC, oblique coronal plane; UD, distal urethral segment; UP, proximal urethral segment; V, verumontanum. Adapted from McNeal (1988b)

Peripheral zone in the normal gland comprises the majority (approximately 65%) of the prostatic volume. As its name implies, it extends around the postero-lateral peripheral aspects of the gland from its apex to its base, and its histological appearance is characterized by small simple acinar spaces