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Prostate Carcinoma

1. GROSS DESCRIPTION

Specimen

— fine needle aspirate/needle core biopsy (18 gauge)/transurethral resection (TUR) chippings/radical prostatectomy (including seminal vesicles) and regional lymphadenectomy.
— weight (g) and size (cm).
— number and length of cores (mm).
— symptomatic prostatic cancer is often indicative of widespread disease with lumbar pain as a result of bone metastases. It may also present with prostatism but is frequently detected because of an elevated serum PSA with digital rectal examination (DRE) either as part of a screening programme or a family practitioner's well man check-up. Further investigation comprises transrectal ultrasound (TRUS) to identify classical tumour-related hypoechoic areas. Because 70% of prostatic cancer is present posteriorly and peripherally this is coupled to per rectum clinical or TRUS-directed needle core biopsies (clinical: right/left/transitional zone; TRUS: sextant/3 samples each side aimed at apex/mid/base regions). Recent evidence shows that a percentage of cancers are isoechoic and an extended 10-core biopsy regime has been advised. The resultant fine biopsy cores need careful handling, wrapping and painting with alcian blue prior to processing to allow their visualization at the block cutting stage. Otherwise initial block trimming may result in loss of diagnostic tissue. Blocks are cut through at least three histological levels and the intervening ribbons kept pending any subsequent need for immunohistochemistry. Microscopic assessment is at low power looking for abnormalities of glandular architecture and medium to high power to confirm cytological features of malignancy. The biopsy report should indicate which biopsy site is positive, the Gleason tumour grade, the number of positive cores and percentage of involved tissue. It may be possible to comment on other staging information, e.g. spread into extracapsular fat or neurovascular bundles, or involvement of seminal vesicles. Another indication for prostatic biopsy is a rising serum PSA after radiotherapy or brachytherapy for a previously proven cancer. Reasons for a repeat biopsy are an insufficient index biopsy, features suspicious but not

diagnostic of malignancy, high-grade PIN and a rising serum PSA after a negative biopsy. Treatment of prostatic cancer is age, fitness, grade and stage-dependent ranging from watchful waiting to hormonal therapy (androgen deprivation) for focal and locally advanced or metastatic disease, respectively. Metastatic disease is assessed by radioisotope bone scan while CT scan and MRI scan have limited sensitivity for local spread. Radical prostatectomy is aimed at younger patients (50–65 years) with low to modest elevations in serum PSA who are more likely to have gland-confined disease and negative surgical margins. It is an operation with significant morbidity and side-effects (e.g. incontinence, impotence), some of which may be avoided by a selective nerve-sparing procedure, although this can have implications for the completeness and tumour clearance of margins. An equivalent alternative with fewer complications is radical radiotherapy and there is also increasing use of brachytherapy (radioactive seed implants) or cryotherapy of the tumour and its bed. Preoperative combination therapy can downsize tumour while post-operative radiotherapy and/or chemotherapy are based on the Gleason component and sum scores, margin status and extracapsular disease. Prostatic chippings piece-meal resect the periurethral and central zones and TURP is performed in two main situations: a. in patients with benign hypertrophy of the medial aspect of the gland who have persistent troublesome prostatism (urinary frequency, hesitancy, dribbling) that is refractory to medical therapy or who develop acute urinary retention, or b. TURP channel re-do in a patient with known cancer and significant prostatic symptoms. In the former incidental cancer may be detected histologically (8% of cases) and the significance of this is then interpreted in light of the patient's serum PSA and clinical staging.

Tumour

Site

— inner (transitional)/outer (central and peripheral) zones. The transitional zone surrounds the proximal urethra and the central zone is posterior to it. The peripheral zone occupies 70% of the gland in a horseshoe shape around its posterior and lateral aspects.
— medial/lateral (right or left) lobes. These are not defined anatomical structures but relate to clinically palpable masses on per rectum examination. For the purposes of TNM staging the gland is notionally divided into right and left lobes about a mid-point sagittal plane
— posterior/subcapsular.
— the majority of carcinomas are posterior and peripheral with multicentricity present in up to 75% of cases.

Size

— length × width × depth (cm) or maximum dimension (cm).
— tumour volume (cm^3). Derived by outlining and calculating the area of tumour in each slide and then multiplying by the mean block