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Prostate

Benign Prostatic Hyperplasia (BPH) or Nodular Hyperplasia

BPH is an extremely common disorder in men over age 50.

It is characterized by hyperplasia of prostatic stromal and epithelial cells.

BPH can be seen in approximately 20% of men 40 years of age, a figure that increases to 70% by age 60 and to 90% by age 80.

Only 25% of those who have microscopic evidence of BPH develop clinical symptoms.

Etiology.

It is believed that the main cause of BPH is **impaired cell death**.

The overall reduction of the rate of cell death, resulting in the accumulation of aged cells in the prostate.

The main androgen in the prostate, is dihydrotestosterone (DHT). It is formed in the prostate from the conversion of testosterone by the enzyme type 2 5 α -reductase. It is believed that DHT-induced growth factors like fibroblast growth factor (FGF) family, particularly FGF-7, FGFs 1 and 2, and TGF β increase the proliferation of stromal cells and decreasing the death of epithelial cells.

Morphology.

Grossly

- 1- The prostate weighs between 60 and 100 gm.
- 2- Nodular hyperplasia of the prostate originates almost exclusively in the inner aspect of the prostate gland (transition zone).
- 3- On cross-section, the nodules vary in color and consistency.

Microscopically

There is nodular appearance. The composition of the nodules ranges from purely stromal fibromuscular nodules to fibroepithelial nodules.

Glands range from small to large to cystically dilated glands, lined by two layers, an inner columnar and an outer cuboidal or flattened epithelium.

The diagnosis of BPH cannot usually be made on needle biopsy, since the histology of glandular or mixed glandular-stromal nodules of BPH cannot be appreciated in limited samples.

Tumors

Adenocarcinoma

Adenocarcinoma of the prostate is the most common form of cancer in men. There is a one in six lifetime probability of being diagnosed with prostate cancer. Cancer of the prostate is typically a disease of men over age 50. Prostatic cancer is uncommon in Asians and occurs most frequently among blacks.

Etiology.

1-Environmental factors, for example, increased consumption of fats has been implicated. Other dietary products suspected of preventing or delaying prostate cancer development include lycopenes (found in tomatoes), selenium, soy products, and vitamin D.

2-Androgens play an important role in prostate cancer. The growth and survival of prostate cancer cells depends on androgens,

3-Family history, men with one first-degree relative with prostate cancer have twice the risk and those with two first-degree relatives have five times the risk of developing prostate cancer.

Morphology.

Grossly

On cross-section of the prostate **the neoplastic tissue is gritty and firm, but when embedded within the prostatic substance it may be extremely difficult to visualize and be more readily apparent on palpation.**

Histologically

Most lesions are adenocarcinomas that produce well-defined, glandular patterns. The glands are typically smaller than benign glands and are lined by a single uniform layer of cuboidal or low columnar epithelium. In contrast to benign glands, prostate cancer glands are more crowded, and characteristically lack branching and papillary infolding. **The outer basal cell layer typical of benign glands is absent.** Nuclei are

large and often contain one or more large nucleoli. There is some variation in nuclear size and shape, but in general pleomorphism is not marked. Mitotic figures are uncommon.

One distinguishing feature between benign and malignant prostate glands is that benign glands contain basal cells whereas they are absent in cancer. Pathologists have using various immunohistologic markers to label basal cells.

Grading

Grading is of particular importance in prostatic cancer, because grade and stage are the best prognostic predictors.

Prostate cancer is graded using the Gleason system, which stratifies prostate cancer into five grades on the basis of glandular patterns of differentiation.

Grade 1 represents the most well differentiated tumors, in which the neoplastic glands are uniform and round in appearance and are packed into well-circumscribed nodules.

In contrast, grade 5 tumors show no glandular differentiation, with tumor cells infiltrating the stroma in the form of cords, sheets, and nests.

The other grades fall in between these extremes.

Most tumors contain more than one pattern; in such instances, a primary grade is assigned to the dominant pattern and a secondary grade to the second most frequent pattern.

The two numeric grades are then added to obtain a combined Gleason score.