BENIGN MIMICS OF PROSTATIC CARCINOMA: PSEUDONEOPLASMS

PETER A. HUMPHREY, M.D., PH.D.
YALE UNIVERSITY SCHOOL OF MEDICINE
NEW HAVEN, CONNECTICUT

MOST COMMON BENIGN MIMICKERS OF ADENOCARCINOMA IN PROSTATE NEEDLE BIOPSY TISSUE

- PARTIAL ATROPHY (36%)
- CROWDED BENIGN GLANDS (26%)
- BENIGN GLANDS (10%)
- COMPLETE ATROPHY (10%)
- RADIATION ATYPIA (6%)
- INFLAMMATORY ATYPIA (5%)
- ADENOSIS (ATYPICAL ADENOMATOUS HYPERPLASIA) (4%)
- BASAL CELL HYPERPLASIA (3%)
- AJSP 29:874-880, 2005

PSEUDONEOPLASTIC LESIONS IN TURP CHIPS

- 26% OF FALSE-POSITIVES = AAH
- 26% = BASAL CELL HYPERPLASIA
- 16% = ATROPHY
- 10% = SCLEROSING ADENOSIS
- 6% = XANTHOGRANULOMATOUS PROSTATITIS
- Semin Urol Oncol 17:199-205, 1999
ATYPICAL ADENOMATOUS HYPERPLASIA (ADENOSIS) :
INCIDENCE

- NEEDLE BIOPSY : 1%
- TRANSURETHRAL RESECTATES (TURP CHIPS) : 2-20%
- RADICAL PROSTATECTOMY : 23-33%

AAH IN TURP CHIP

AAH IN RADICAL PROSTATECTOMY
**AAH (ADENOSIS)**
A SMALL PALE ACINAR PROLIFERATION

**FRAGMENTED BASAL CELL LAYER IN AAH**

34betaE12 immunostain

NOTE: AMACR (P504S) DIFFUSELY POSITIVE IN 8% OF CASES (AJSP 26:921, 2002); ERG Negative (AJSP 37:1550, 2013)

**AAH IN NEEDLE BIOPSY**
DIFFUSE ADENOSIS OF THE PERIPHERAL ZONE (DAPZ)


SCLEROSING ADENOSIS OF THE PROSTATE

CLINICAL SIGNIFICANCE OF AAH: UNCERTAIN

- MANY CASES MAY BE A BENIGN VARIANT OF USUAL HYPERPLASIA
- BUT A MINORITY OF CASES HAVE GENETIC ABNORMALITIES LIKE CARCINOMA
ATROPHY OF THE PROSTATE IS A COMMON, AGE-RELATED PROCESS

- ATROPHY ACTUALLY BEGINS EARLY IN THE 3rd DECADE OF LIFE AND BECOMES PROGRESSIVELY MORE PROMINENT UNTIL THE 9TH DECADE, WHEN MORE THAN ONE-HALF OF THE GLAND MAY BE ATROPHIC.

ATROPHY = CYTOPLASMIC VOLUME LOSS

WORKING GROUP CLASSIFICATION OF FOCAL ATROPHY

- SIMPLE ATROPHY
- SIMPLE ATROPHY WITH CYST FORMATION
- POST-ATROPHIC HYPERPLASIA
- PARTIAL ATROPHY
- FOCAL PROSTATE ATROPHY NOT OTHERWISE SPECIFIED
- PROLIFERATIVE ATROPHY AND PROLIFERATIVE INFLAMMATORY ATROPHY: OPTIONAL

SCLEROTIC ATROPHY
Misdiagnosed as adenocarcinoma

ELASTOTIC ATROPHY

NUCLEAR ATYPIA IN ATROPHY
PARTIAL ATROPHY

PARTIAL ATROPHY

PARTIAL ATROPHY VS. FOAMY GLAND ADENOCARCINOMA

Neoplastic Mimics in Genitourinary Pathology, 2013
POSTATROPHIC HYPERPLASIA: CASE MISDIAGNOSED AS ADENOCARCINOMA

CORD-LIKE ATROPHY

CHAIN-LIKE ATROPHY WITH PSEUDOFUSION
ATROPHY WITH INFLAMATION

ATROPHY VS. ADENOCARCINOMA

ATROPHY VS. ADENOCARCINOMA
Adenocarcinoma Invasion into Post-atrophic Hyperplasia

Adenocarcinoma Invasion into Atrophy

BASAL CELL MARKERS IN ATROPHY: HIGH MOLECULAR WEIGHT CYTOKERATIN

Fragmented to absent basal cell layer
AMACR IMMUNOSTAIN
PITFALL: POSITIVITY IN
ATROPHY

Largest series: 0 to 31%

“TRIPLE STAIN” TRAP:
PARTIAL ATROPHY

NORMAL BASAL CELLS
BASAL CELL HYPERPLASIA

- RESEMBLES FETAL PROSTATIC TISSUE AND SO HAS BEEN CALLED FETALIZATION OF THE PROSTATE AND EMBRYONAL HYPERPLASIA
- USUALLY OCCURS IN ASSOCIATION WITH BPH, BUT CAN BE SEEN IN THE PERIPHERAL ZONE, OFTEN IN INFLAMMED FOCI (Mod Pathol 16:598-606, 2003)

BASAL CELL HYPERPLASIA

- INCIDENCE IN NEEDLE BIOPSY: 10%
- INCIDENCE OF BCH WITH PROMINENT NUCLEOLI: 2%
- TWO OR MORE CELL LAYERS OF BASAL CELLS
- ACINAR, CRIBRIFORM, AND SOLID GROWTH PATTERNS

BASAL CELL HYPERPLASIA IN NEEDLE BIOPSY
BASAL CELL HYPERPLASIA: PARTIAL GLAND INVOLVEMENT TO SOLID NESTS

PARTIAL GLAND INVOLVEMENT BY BASAL CELL HYPERPLASIA

BASAL CELL HYPERPLASIA: CRIBRIFORM GROWTH
BASAL CELL HYPERPLASIA: SOLID NESTS

BASAL CELL HYPERPLASIA: PSEUDONINFILTRATION

BASAL CELL HYPERPLASIA VS. ADENOCARCINOMA
BASAL CELL HYPERPLASIA WITH PROMINENT NUCLEOLI

INFLAMMATORY ATYPIA

PERINEURAL LYMPHOCYTES
CRUSHED LYMPHOCYTES VS. CRUSHED CARCINOMA

PROSTATIC PARAGANGLION AND GANGLION CELLS

PITFALL: PERINEURAL AND INTRANEURAL BENIGN GLANDS

INCIDENCE OF INADVERTENTLY-SAMPLED SEMINAL VESICLE

- 3% of TURP cases
- 5% of prostate needle biopsy cases

SEMINAL VESICLE AND EJACULATORY DUCT

SEMINAL VESICLE VS. PROSTATIC LIPOFUSCIN
SEMINAL VESICLE/EJACULATORY DUCT EPITHELIUM CAN LACK PIGMENT

NUCLEAR ATYPIA IN SEMINAL VESICLE/EJACULATORY DUCT EPITHELIUM

SMUDGED CHROMATIN

NUCLEAR PSEUDOINCLUSIONS

SEMINAL VESICLE GLAND CROWDING
SEMINAL VESICLE AMYLOID


SEMINAL VESICLE INTRALUMINAL CRYSTALLOIDS

SEMINAL VESICLE/EJACULATORY DUCT IN NEEDLE BIOPSY
SPERMATOZOA IN GLANDS

MARKERS IN DIFFERENTIAL DIAGNOSIS: SEMINAL VESICLE VS. PROSTATIC ADENOCARCINOMA

CROWDED BENIGN GLANDS AS AN ARCHITECTURAL MIMIC OF PROSTATIC CARCINOMA
CROWDED BENIGN GLANDS IN NEEDLE BIOPSY

INfiltrative-Appearing Benign Glands

34betaE12 immunostain

NORMAL CENTRAL ZONE GLANDS
BENIGN ATROPHIC GLANDS IN SKELETAL MUSCLE

CRIBRIFORM HYPERPLASIA : CASE MISDIAGNOSED AS ADENOCARCINOMA

MESONEPHRIC REMNANT HYPERPLASIA
XANTHOMA OF PROSTATE vs. PROSTATIC ADENOCARCINOMA WITH ANDROGEN DEPRIVATION THERAPY EFFECT AND FOAMY GLAND CARCINOMA

SIGNET RING LYMPHOCYTES SECONDARY TO THERMAL DAMAGE

COWPER’S GLANDS
DUCTAL ADENOCARCINOMA VS. PROSTATIC TYPE EPITHELIAL POLYP

EXTERNAL BEAM RADIATION THERAPY FOR PROSTATE CANCER

BRACHYTHERAPY (RADIOACTIVE SEED IMPLANTATION) FOR PROSTATE CANCER
EFFECT OF RADIATION ON BENIGN PROSTATIC TISSUE

- ATROPHY
- NUCLEAR ATYPIA: NUCLEAR PLEOMORPHISM AND NUCLEOLAR PROMINENCE
- BASAL CELL PROMINENCE/HYPERPLASIA
- STROMAL FIBROSIS
- VASCULAR DAMAGE


RADIATION TREATMENT EFFECT ON BENIGN GLANDS

RADIOThERAPY EFFECT ON BENIGN PROSTATIC GLANDS: NUCLEAR ATYPIA
UTILITY OF HIGH MOLECULAR WEIGHT CYTOKERATIN DETECTION IN DIAGNOSIS OF RADIATION-ATYPIA IN BENIGN PROSTATIC GLANDS

AMACR also helpful (Urology 62: 282-286, 2003)