Prostate Got You STUMPed?

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Disclosures

• I do not have financial/other relationships with the manufacturer(s) of commercial product(s) or provider(s) of commercial service(s) that would affect my views discussed in this educational activity.
Objectives

• Case Presentation
• Prostate Stromal Sarcoma/ Stromal Tumor of Uncertain Malignant Potential (STUMP)
  • Etiology/incidence
  • Clinical presentation
  • Gross and histologic features
  • Differential Diagnoses
  • Grading and Staging
  • Prognosis and treatment
• So what?
71-year-old male veteran with history of
- HTN/HLD/Obesity
- Chronic back pain
- PTSD
- Agent orange exposure
- Benign prostatic hyperplasia
  - Urinary retention/incontinence
  - Using self catheterization
Agent Orange

- Herbicide used by the US military to clear vegetation during the Vietnam war
- Exposure increases risk of multiple diseases
  - Birth defects
  - AL amyloidosis
  - Hematopoietic neoplasms
  - Chloracne
  - Diabetes Mellitus type 2
  - Ischemic heart disease
  - Parkinson's disease
  - Peripheral neuropathy
  - Porphyria cutanea tarda
  - Lung Cancer
  - Prostate cancer
  - Soft tissue sarcoma
Agent Orange

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Presented for re-evaluation of urinary incontinence and hematuria.

- **Imaging**
  - Lumbosacral x-ray: degenerative changes L5-S1
  - CT urogram: Left prostate gland concerning for malignancy
  - Cystoscopy: abnormal white/yellow tissue in prostatic fossa concerning for malignancy
- **Urine cytology (x2)**
  - Negative for malignancy
- **Recommended for transurethral resection of prostate**
Case Presentation

Immunohistochemistry
Positive: SMA, vimentin
Negative: Pancytokeratin, HMWK, p63, desmin, GATA3, PSA, PSAP, S100, CD34

Diagnosis
Prostate, transurethral resection: High grade sarcoma
Prostate Stromal Neoplasms

Neoplastic proliferation of the mesenchymal elements of the prostate gland

• 2 categories in WHO classification
  • Stromal Tumor of Uncertain Malignant Potential (STUMP)
  • Prostate Stromal Sarcoma (PSS)
Epidemiology

- Very rare
  - <0.2% of prostate malignancies
- Peak incidence in the 6th and 7th decades.
- May be related to prostatitis, perineal trauma, previous prostate biopsy, or radiation
Clinical Presentation

- Urinary retention
- Hematuria or hematospermia
- Palpable rectal mass.
- PSA not necessarily elevated
Diagnosis

Florid Hyperplasia
- Lobulated or nodular architecture
- Characteristic vascular pattern with small round blood vessels +/- hyalin thickening

STUMP
- More diffuse growth pattern
- Does not contain characteristic small blood vessels

Histology
Diagnosis

Florid Hyperplasia

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Histology

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**STUMP**
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**Diagnosis**

**STUMP**
- Histologic overlap with florid stromal hyperplasia
  - Bland nuclear features
  - Proliferation of stromal elements

**Stromal Sarcoma**
- Overtly malignant features are more easily distinguished from florid stromal hyperplasia
  - Greater cellularity
  - Cytological atypia
  - Mitotic activity
  - Tumor cell necrosis
  - Can have Phyllodes-like patterns

**Histology**
Diagnosis

STUMP
• Histologic overlap with florid stromal hyperplasia
• Bland nuclear features
• Proliferation of stromal elements

Stromal Sarcoma
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Histology
Diagnosis

Immunohistochemistry

Positive Stains (usually)
- Vimentin
- CD34
- Progesterone receptor
- Smooth muscle actin (STUMP > Sarcoma)
- Desmin (STUMP > Sarcoma)

Negative Stains
- S100
- Estrogen Receptor (usually)
Differential Diagnoses

- Solitary fibrous tumor
- Gastrointestinal stromal tumors (GIST)
- Schwannomas
- Post-radiation sarcomas
- Sarcomatoid carcinoma
- Myofibroblastic proliferations
- Smooth muscle neoplasms
- Rhabdomyosarcomas
- Mixed epithelial stromal tumors of the seminal vesicle
• Solitary fibrous tumor
  • *Spindled cells, patternless pattern, angulated hemangiopericytic vessels.*
  • *STAT6, CD34, NAB2-STAT6 fusion*
• Gastrointestinal stromal tumors (GIST)
• Schwannomas
• Post-radiation sarcomas
• Sarcomatoid carcinoma
• Myofibroblastic proliferations
• Smooth muscle neoplasms
• Rhabdomyosarcomas
• Mixed epithelial stromal tumors of the seminal vesicle
- Solitary fibrous tumor
- Gastrointestinal stromal tumors (GIST)
  - broad and variable morphologic spectrum
  - CD117 (characteristic), and DOG-1, CD34, (DOG-1 and CD34 can be seen in PSS)
- Schwannomas
- Post-radiation sarcomas
- Sarcomatoid carcinoma
- Myofibroblastic proliferations
- Smooth muscle neoplasms
- Rhabdomyosarcomas
- Mixed epithelial stromal tumors of the seminal vesicle
• Solitary fibrous tumor
• Gastrointestinal stromal tumors (GIST)
• Schwannomas
  • *Variable amounts of hypercellular Antoni A and hypocellular Antoni B areas*
  • *Large caliber blood vessels with mural hyalinization, nuclear palisading, “wavy” spindle cells, hypercellular and hypocellular zones.*
  • *S100 positive*
• Post-radiation sarcomas
• Sarcomatoid carcinoma
• Myofibroblastic proliferations
• Smooth muscle neoplasms
• Rhabdomyosarcomas
• Mixed epithelial stromal tumors of the seminal vesicle

• Solitary fibrous tumor
• Gastrointestinal stromal tumors (GIST)
• Schwannomas
• Post-radiation sarcomas
  • About 10 years following radiation therapy
  • Distinguishing between a sarcomatoid carcinoma and a post-radiation sarcoma may be impossible in some cases.
• Sarcomatoid carcinoma
• Myofibroblastic proliferations
• Smooth muscle neoplasms
• Rhabdomyosarcomas
• Mixed epithelial stromal tumors of the seminal vesicle
Differential Diagnoses

• Solitary fibrous tumor
• Gastrointestinal stromal tumors (GIST)
• Schwannomas
• Post-radiation sarcomas
• Sarcomatoid carcinoma
  • Rare
  • May appear as an aggressive recurrence of acinar adenocarcinoma
  • Mixture of epithelioid and sarcomatous elements
  • Less differentiated cells may lose some markers
• Myofibroblastic proliferations
• Smooth muscle neoplasms
• Rhabdomyosarcomas
• Mixed epithelial stromal tumors of the seminal vesicle
Differential Diagnoses

- Solitary fibrous tumor
- Gastrointestinal stromal tumors (GIST)
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- Post-radiation sarcomas
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- Mixed epithelial stromal tumors of the seminal vesicle
Federation of Cancer Centers Sarcoma Group (FNCLCC)
• 3 grades
  • differentiation
  • mitotic activity
  • necrosis

American Joint Committee on Cancer (AJCC)
• Grade grouping for staging
  • Low grade: Grade 1
  • High grade: Grade 2, 3
• STUMP: indolent, generally cured with complete resection.
  • May be treated more conservatively.
  • Rare cases associated with sarcomatous dedifferentiation

• Sarcomas have fully metastatic potential
  • Surgical resection
  • +/- adjuvant therapy
So What?

• Agent orange exposure can increase chances of multiple diseases
• Because of low incidence, may be poorly recognized
• Build IHC panel wisely
  • Vimentin, CD34, ER, PR, PSA, PSAP, GATA3
  • Solitary fibrous tumor? STAT6
  • GIST? CD117, DOG-1 (can be seen in PSS)
  • Schwannoma? S100
  • Melanoma? S100, SOX10, Melan A, etc
References


Kallen, Michael E. MD*; Hornick, Jason L. MD, PhD† The 2020 WHO Classification, The American Journal of Surgical Pathology: August 12, 2020 - Volume Publish Ahead of Print - Issue -doi: 10.1097/PAS.0000000000001552

Thank you!
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