Urology Update for the Primary Care Provider

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Mercy Urology
Disclosures

- None
Topics

- Update growth of Mercy Urology Clinic
- Update on recent BPH therapies
- Introduction of comprehensive prostate cancer services
- Diagnosis / Treatment of renal masses
Mercy Urology

- Second Anniversary 9/6/2018
- Current complement:
  - Physicians:
    - Matt Smith
    - Jerry Murphy
    - Nathalie Francois
  - Mid Levels
    - NP hired – Stacy Pohlman, start in next 1-2 months
Mercy Urology

- Nursing/clinical staff
  - 3 Urologic procedural nurses
    - 2 new RN started this week, 1 more approved
    - Special training for urology specific clinic procedures
  - Surgery scheduler / float RN
  - 2 Medical Assistants
  - Dedicated pelvic floor PT (in clinic, shared time physical therapist)

- Administrative staff
  - Nurse Manager
  - Front Desk (1 FTE, 1 more approved)
Challenges

- The long pole in the tent keeps changing
  - Physicians
  - Nursing staff
  - Admin staff
  - Facility
    - New clinic opened Spring 2018
    - Open house / blessing 10/3/18
  - Equipment / technology
Mercy Urology Clinic

- Opened March 2018
- 8 clinic rooms
- 4 procedure rooms
  - Dedicated urodynamics suite
- Sized for 4 to 5 providers
- Better Access for patients
- Easy integration into HPCC for cancer care
New Ventures

• New Technology
  • BPH Treatment
  • Robotics
  • Fusion Biopsy
• Comprehensive prostate cancer care
• Dedicated Pelvic floor PT
• Metabolic kidney stone clinic
Treatment of BPH

- Surgical options
- Medications
- Conservative Measures
Surgical Treatment of BPH

- TURP is standard for 100+ years
- Incremental change in equipment, but technique is largely the same
  - Bipolar cautery
  - Laser vaporization
- Some newer techniques for very large prostates
  - Holmium laser enucleation
  - Robotic simple prostatectomy
- Long desire for minimally invasive technique
History of minimally invasive techniques

- Urethral stent ‘Uroloom’
History of minimally invasive techniques

- Urethral stent ‘Urolooom’
  - No successful
  - Urinary symptoms
  - Calcification
  - Most removed
History of minimally invasive techniques

- Urethral stent ‘Uroloom’
- TUNA
  - Trans Urethral Needle Ablation
  - RF energy
  - Minimal long range symptom improvement
History of minimally invasive techniques

- Urethral stent ‘Urolooom’
- TUNA
- TUMT
  - Trans Urethral Microwave Thermotherapy
  - Similar results to TUNA
Advantages of Minimally invasive techniques

• Less Hospitalization
• Less time, if at all, with catheter
• Less pain / urinary symptoms
• Less need for general Anesthesia
Disadvantages of Minimally invasive techniques

- Questionable long term data
- Learning curve
- Long term side effects
- Less efficacious in large glands / median lobes
New Techniques

- UroLift
- REZUM
- Aqua-ablation (Waterjet)
- HiFU (focused high frequency ultrasound)
There's A Better Option to Treat Enlarged Prostate

A Fast and Effective Approach to Treating BPH
Urolift

- Minimally invasive treatment for BPH
- Designed for in-office placement, or minimal anesthesia in OR for outpatient surgery
- Nearly 10 years of data
- Uses small device to ‘pull back’ the obstructing tissue
Urolift vs TURP

- Decrease in Urinary symptoms
  - 72.7% vs 91.2%
- Persevered erectile function
  - 97.4% vs 93.9%
- Preserved ejaculatory function
  - 100% vs 60.6%
- Continence
  - 85% vs 75%
Prostate Cancer Detection and Treatment

- We currently provide comprehensive prostate cancer detection, treatment, and surveillance
- Goal moving forward is to integrate the entire spectrum of care for a better patient experience
- Administered with new Nurse Practitioner
  - All existing MD visits remain
  - Plan to add:
    - New diagnostics (Fusion)
    - Pre and post op of NP/PT visits for continence and ED
  - Continue with Advanced Prostate cancer clinic (Transitioning NP)
Prostate Cancer detection

- Standard for 20+ years: Trans Rectal Ultrasound Guided prostate biopsy
  - Real time procedure
  - 20-30% false negative rate
  - Infection risk
  - Need for repeat biopsy
  - Ultrasound good at visualizing prostate
    - Not great at noting cancer
    - ‘random biopsy’
Functional Prostate MRI

- Great Anatomic fidelity
- Ability to identify likely sites of clinically significant prostate cancer using PiRads System
  - Clinically Significant: Gleason 7 and above
- Not very good at seeing low grade cancer
  - This is a good thing!
- Difficult (not impossible) for real time biopsy
  - Requires non-ferrous biopsy equipment
  - Awkward for patient
  - Time
<table>
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<th>PI-RADS</th>
<th>Description</th>
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<tr>
<td>1</td>
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<tr>
<td>2</td>
<td>Low (clinically significant cancer unlikely)</td>
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<td>3</td>
<td>Intermediate (clinically significant cancer equivocal)</td>
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<tr>
<td>4</td>
<td>High (clinically significant cancer likely)</td>
</tr>
<tr>
<td>5</td>
<td>Very high (clinically significant cancer highly likely)</td>
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Fusion Biopsy

- Using shared landmarks, ‘fuse’ the high fidelity MRI image onto the real time ultrasound for location of regions of interest
  - Can target lesions down to a few mm
  - Higher yield
- Mobile workstation
- Electromagnetic Field Generator
- Universal Tracking Sensor
- Custom-molded Sensor Clips
Thoughts on fusion

- Not perfect
  - TRUS misses 20-30% of cancers
  - MRI misses ~20% of cancers
    - NOT the same cancers!
- Buy in from Urology, Radiology, Pathology
  - Reproducible PiRads scoring, feedback from pathology
  - Beginning workgroup here at Mercy
- Equipment / learning curve
- My thought: This will be standard of care in 3-5 years
Renal Masses

- Renal masses are a common incidental finding
- Masses can usually be differentiated well with cross sectional imaging, into benign or malignant courses
- Urologic referral is recommended for newly diagnosed renal masses, for stratification and treatment if necessary.
- Masses can be solid or cystic, both can be benign or malignant.
Benign renal lesions

- Cystic lesions
  - Simple or minimally complex renal cysts
- Solid lesions
  - Angiomyolipoma
  - Oncocytoma
  - Papillary Adenoma of the kidney
  - Metanephric adenoma
  - . . . . . (rare subtypes)
Renal Cystic Lesions

- Common
  - 27% in patients 50 or older (J Clin Radiol 1983)
  - Increasing frequency with age
- Usually benign
- Most commonly found incidentally
- Bosniak system used for categorization
Simple Cyst (Bosniak I)

- 65 – 70% of all renal cysts
- Can be solitary or multi-focal
- Almost never malignant
- Growth is variable, averages 1.9 mm/yr
- Follow up is generally not needed
  - Often get u/s in 12 months to ensure stability, esp in larger or multifocal cysts
- Intervention is very large or symptomatic
  - Percutaneous >> laparoscopic
Minimally complex Cyst (Bosniak II)

- Cysts that have minimal complicating features
  - Thin septum
  - Fine calcifications
  - Hyperdense cysts <3cm
- Can be solitary or multi-focal
- Almost never malignant (1-5%)
- Follow up is generally not needed
  - Often get u/s in 12 months to ensure stability, esp in larger or multifocal cysts
- Intervention is very large or symptomatic
  - Percutaneous >> laparoscopic
Complex Cyst (Bosniak III)

- Cysts with complicating features
  - Thickened, or irregular walls
  - Measurable enhancement
- 40-60% Malignant
- Intervention typically recommended
Complex Cyst (Bosniak IV)

- Bosniak III characteristics, with enhancing soft tissue component
- 85%+ malignant
- Intervention typically recommended
Simple Cyst (Bosniak IIF)

- Category developed to minimize intervention into ‘weak’ Bosniak II lesions
  - ‘more complex than II, less complex than a real III
- Approx 5% malignant
- Follow up is recommended
  - 6-12 months, then annual
  - Length of follow up is controversial
- Intervention if progression
Benign renal lesions

- Cystic lesions
  - Simple or minimally complex renal cysts
- Solid lesions
  - Angiomyolipoma
  - Oncocytoma
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  - . . . . . (rare subtypes)
Angiomyolipoma

- Usually Benign
- F > M (typical presentation is 40-60 y/o F)
- Consists of:
  - Blood vessels (angio)
  - Muscle (myo)
  - Fat (lipoma)
- <4cm: Treat only if symptomatic
- >4cm: Treat on non-emergent basis
- Tx: Selective embolization > surgery
Oncocytoma

- Benign
- On spectrum with chromophone Renal Cell Carcinoma
- M > F (M 40-60)
- Imaging appears malignant (enhancing)
- Biopsy traditionally could not distinguish ( . . .)
- Path: Central scar
- Tx:
  - Traditional thinking: surgical excision
    - RCC often co-exists in final specimen
    - These can grow LARGE
  - Now: Usually excision, with surveillance in some cases
Papillary Adenoma

- Most common solid renal mass
- Usually found incidentally at autopsy
- <5mm
- Can be difficult to distinguish from RCC
  - Benign nature assumed due to no metastatic findings
Metanephric adenoma

- Rare
  - First described 1995
  - Associated with polycythemia (12%)
  - Larger tumors
- Difficult to differentiate from RCC prior to excision.
- Usually diagnosed after nephrectomy
Renal cell carcinoma

- Classic Triad
  - Hematuria
  - Flank Pain
  - Abdominal Bulge
- Now: Rarely see this (but not never!)
- Other subtle signs/Symptoms
  - Isolated RIGHT varicocele
  - LE edema
  - Hypercalcemia
  - Anemia
  - HTN
RENAL MASS AND LOCALIZED RENAL CANCER: AUA GUIDELINE

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Renal Mass and Localized Renal Cancer

Evaluation/Diagnosis
1. Obtain high-quality, multiphase, cross-sectional abdominal imaging to optimally characterize the renal mass.
2. Obtain CTP, CBC, and UA. If malignancy suspected, metastatic evaluation should include chest imaging and careful review of abdominal imaging.
3. Assign CKD stage based on GFR and degree of proteinuria.

Counseling
1. A urologist should lead the counseling process and should consider all management strategies. A multidisciplinary team should be included when necessary.
2. Counseling should include current perspectives about tumor biology and a patient-specific oncologic risk assessment. For cT1a tumors, the low oncologic risk of many small renal masses should be considered.
3. Counseling should review the most common and serious analogous and non-analogous complications of each treatment pathway and the importance of patient age, comorbidities/frailty, and life expectancy.
4. Physicians should review the importance of renal functional recovery related to renal mass management, including risk of progressive CKD, potential short/long-term need for dialysis, and long-term overall survival considerations.
5. Consider referral to nephrology in patients with a high risk of CKD progression, including those with GFR < 45%, confirmed proteinuria, diabetes with progressing CKD, or whenever GFR is expected to be < 30 after intervention.
6. Recommend genetic counseling for all patients ≤ 45 years of age and consider genetic counseling for patients with hereditary or bilateral renal masses, or if personal family history suggests a familial renal neoplasm syndrome.

Management

Partial Nephrectomy (PN) and Nephron-Sparing Approaches
1. Prioritize PN for the management of the cT1a renal mass when intervention is indicated.
2. Prioritize nephron-sparing approaches for patients with anatomic or functionally solitary kidney, bilateral tumors, known renal cell carcinoma (RCC), preservation of CKD, or proteinuria.
3. Consider nephron-sparing approaches for patients who are young, have multifocal masses, or comorbidities that are likely to impact renal function in the future.

Radical Nephrectomy (RN)
1. Physicians should consider RN for patients where increased oncologic potential is suggested by tumor size, RMB, and/or imaging characteristics. In this setting, RN is preferred if all of the following criteria are met: 1) high tumor complexity and PN would be challenging even in experienced hands; 2) no existing CKD proteinuria; and 3) normal contralateral kidney and new baseline GFR will likely be ≥ 45.

Thermal Ablation (TA)
1. Consider TA as an alternate approach for management of cT1a renal masses < 3 cm in size. A percutaneous approach is preferred.
2. Both radiofrequency ablation and cryosurgery are options.
3. A RMB should be performed prior to TA.
4. Counseling about TA should include information regarding increased likelihood of tumor persistence/recurrence after primary TA, which may be addressed with repeat TA if further intervention is elected.

Active Surveillance (AS)
1. For patients with renal masses suspicious for cancer, especially those >7cm, AS is an option for initial management.
2. Prioritize AS Expectancy Management when the anticipated risk of intervention or competing risks of death outweigh the potential oncologic benefit of active treatment.
3. When the risk/benefit analysis for treatment is equivocal and the patient prefers AS, physicians should openly discuss in 2-6 months to assess for interval growth and may consider RMB for additional risk stratification.
4. When the oncologic benefit of intervention outweighs the risks of treatment and competing risks of death, physicians should recommend active treatment. In this setting, AS may be pursued only if the patient understands and is willing to accept the associated oncologic risk.

Factors Favoring AS/Expectancy Management

Patient-related
- Elderly
- Life expectancy < 5 years
- High comorbidities
- Excessive perioperative risk
- Frailty (poor functional status)
- Patient preference for AS

Tumor-related
- Tumor size < 3 cm
- Tumor growth < 5 mm/year
- Non-infiltrative
- Low complexity
- Favorable histology

Surgical Principles
1. In the presence of clinically concerning regional lymphadenopathy, lymph node dissection should be performed for staging purposes.
2. Adrenalectomy should be performed if imaging and/or intraoperative findings suggest metastasis or direct invasion.
3. A minimally invasive approach should be considered when it would not compromise oncologic, functional, and perioperative outcomes.
4. Pathologic evaluation of the adjacent renal parenchyma should be performed after PN or RN to assign for possible nephropathy disease, particularly for patients with CKD or risk factors for developing CKD.

AUA Guidelines 2017
Renal cell carcinoma

- New Guidelines in 2017: “Increased emphasis on functional aspects, recognizing importance of functional outcomes for survivorship for most patients with localized RCC”
  - Patients with localized RCC are unlikely to die of kidney cancer
    - 12/545 (2.8%) disease specific mortality at 9.3 years
    - EORTC 30904
Dx of renal mass

- High quality cross sectional imaging should be obtained
  - CT Mass protocol
    - Enhancing Renal cortical mass
  - MRI
- A urologist should lead the counselling process and a multi-disciplinary team should be included when necessary.
Imaging
Staging of RCC

T  Primary Tumor
TX  Primary tumor cannot be assessed
T0  No evidence of primary tumor
T1  Tumor ≤7 cm in greatest dimension, limited to the kidney
    T1a Tumor ≤4 cm in greatest dimension, limited to the kidney
    T1b Tumor >4 cm but ≤7 cm in greatest dimension, limited to the kidney
T2  Tumor >7 cm in greatest dimension, limited to the kidney
    T2a Tumor >7 cm but ≤10 cm in greatest dimension, limited to the kidney
    T2b Tumor >10 cm, limited to the kidney
T3  Tumor extends into major veins or perinephric tissues, but not into the ipsilateral adrenal gland and not beyond Gerota’s fascia
    T3a Tumor extends into the renal vein or its segmental branches, or invades the pelvicalyceal system, or invades perirenal and/or renal sinus fat but not beyond Gerota’s fascia
    T3b Tumor extends into the vena cava below the diaphragm
    T3c Tumor extends into the vena cava above the diaphragm or invades the wall of the vena cava
T4  Tumor invades beyond Gerota’s fascia (including contiguous extension into the ipsilateral adrenal gland)

N  Regional Lymph Nodes
NX  Regional lymph nodes cannot be assessed
N0  No regional lymph node metastasis
N1  Metastasis in regional lymph node(s)

M  Distant Metastasis
M0  No distant metastasis
M1  Distant metastasis

Table 2. AJCC Prognostic Groups

<table>
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<th>Stage</th>
<th>T</th>
<th>N</th>
<th>M</th>
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<tr>
<td>Stage I</td>
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<td>M0</td>
</tr>
<tr>
<td>Stage III</td>
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<tr>
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<td>T3</td>
<td>N0-N1</td>
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<tr>
<td>Stage IV</td>
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<tr>
<td></td>
<td>Any T</td>
<td>Any N</td>
<td>M1</td>
</tr>
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Treatment of malignant or suspicious renal masses

- New Guidelines
  - Radical Nephrectomy reserved when necessary
  - Partial nephrectomy for typical lesion (T1a, <4cm)
  - Selective utilization of ablation (patient parameters, tumors <3cm)
  - Shared decision making for Active Surveillance
Renal Mass Biopsy

- Should be considered if non RCC is suspected
  - Infection, inflammation, metastatic, hematologic
- Otherwise, should be obtained on case by case basis
  - Not required if decision to treat will be recommended regardless of result
    - negative biopsy in young healthy individual, worry about false negative
    - Positive biopsy in old frail individual, will go forward with active surveillance regardless
Biopsy counselling

- Safe
  - Hematoma 4.9%
  - Significant pain 1.2%
  - Gross Hematuria 1.0%
  - Pneumothorax 0.6%
  - Hemorrhage requiring transfusion 0.4%
- HIGH PPV (99.8%)
- Non Diagnostic 14%
  - Can you trust a negative result?
- Core biopsy preferred over FNA (histology / structure is important in diagnosis)
Radical Nephrectomy

- Very good oncologic outcomes
  - >90/95% for T1/T2 tumors
- Traditional gold standard, now used selectively
- Radical nephrectomy preferred when
  - T2 or greater tumors
  - Technically challenging for partial
  - No pre-existing CKD or proteinuria
  - Normal contralateral kidney; expected new EGFR > 45
Partial Nephrectomy

- Treatment of choice for small renal masses (<4cm)
- Should be considered for larger masses that are located in a favorable location
- Priority is negative surgical margin
- Given the above, attempts should be made to preserve renal function.
Surgical/Percutaneous ablation

- Guidelines recommend ablation for:
  - Familial RCC (high likelihood of recurrent lesions)
  - Multifocal disease
  - Severe CKD
- Also, for carefully selected patient
  - i.e. older, sicker, less likely to tolerate anesthesia
- Most ablations here done percutaneously by IR
  - Surgical ablation when unable to reach tumor safely with percutaneous approach
  - BUT . . . . Patients should be evaluated for this by urology
Active Surveillance

**Baseline Assessment**

**PATIENT FACTORS**
- Co-morbidity/life expectancy (Comorbidity Index/Frailty Score)
- Patient expectations/QOL and psychosocial assessment
- Renal functional assessment

**TUMOR FACTORS (ONCOLOGIC POTENTIAL OF SOLID OR COMPLEX CYSTIC RENAL MASSES)**
- Imaging features (degree of enhancement, infiltrative appearance, vascular or fat invasion)
- Tumor complexity
- Prior imaging (if available) to compare size and features
- Renal mass biopsy (subtype, grade, biomarkers)

**MANAGEMENT RELATED FACTORS (RISKS AND BENEFITS)**
- Evidence regarding oncologic, renal function, and peri-procedural outcomes for each type of treatment
- ACS/NSQIP calculator
- Evidence regarding expected growth rates, efficacy of surveillance, triggers and risk of delayed intervention

**COMMUNICATION**
- **SHARED DECISION MAKING**
- **Frequency** & **Imaging Modality**

**ACTIVE SURVEILLANCE:**
- Approximately every 3-6 months
- Use cross sectional imaging and/or US

**EXPECTANT MANAGEMENT:**
- Approximately every 6-12 months
- Use US more frequently

**Potential triggers for change in management (Rx or AS intensity)**
- Tumor size >3 cm
- Stage progression
- Kinetics (>5mm / year)
- Clinical changes in patient/tumor factors

**PROGRESSION TO mRCC**

**TREATMENT**

* Consider concurrent renal functional assessment (sCr, proteinuria), metabolic assessment (LFTs) and chest imaging
* Consider alternatives to contrast when possible or necessary (doppler, diffusion weighted images etc.)
## Patient/tumor related factors favoring AS/Expectant Management versus Intervention

<table>
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<tr>
<th></th>
<th>Patient-related factors</th>
<th>Tumor factors</th>
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| **Favor AS or Expectant Management** | Elderly  
Life expectancy <5 years  
High comorbidities  
Excessive perioperative risk  
Poor functional status  
Marginal renal function  
Patient preference to avoid risks of Rx | Tumor size <3cm  
Tumor growth <5mm/year  
Non-infiltrative on imaging  
Low complexity  
Favorable histology (if RMB performed) |
| **Favor Intervention** | Young  
Life expectancy >5 years  
Low comorbidity  
Acceptable periop risk  
Good functional status  
Anticipate adequate function following intervention  
Patient preference for Rx | Tumor size >3cm  
Tumor growth >5mm/year  
Infiltrative on imaging  
High complexity  
Unfavorable histology (if RMB performed) |
Metastatic / Large Volume Renal Cancer

- Most renal cancers are caught early as stage I/II
  - Surgical disease
  - Usually treated by urology
    - Sometimes referral to IR
- Larger or metastatic lesions require multi-disciplinary approach
  - Surgical: may need referral to Tertiary facility (Cardiac / Liver surgical team)
  - Heme/Onc: Traditionally not responsive to chemo, but evolving checkpoint inhibitors / Immune therapies now being used
  - RadOnc: Traditionally not responsive to XRT, but trials ongoing
- At Mercy: Multi-Disciplinary Tumor board every second Thursday
  - Surgery, Onc, RadOnc, Path, Radiology present
Renal Masses Takeaways

- Urology referral for all suspicious renal lesions
- Needs dedicated 3 dimensional imaging for diagnosis
- Treatment options geared to overall patient needs using shared decision making
- Multi-disciplinary approach for larger / metastatic lesions
Questions??

• ANY questions, contact any of us
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