PRE-DIALYSIS CARE OF THE PATIENT WITH CHRONIC KIDNEY DISEASE

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Management of CKD Patient

- Treat/prevent consequences of declining renal function
  - Anemia
  - Bone health
  - Nutrition
  - Hyperlipidemia
  - Vascular disease
  - Hypertension
- Slow progression
  - Delay or prevent ESRD
- Anticipate ESRD
- Plan for renal replacement therapy
  - Dialysis Modality
  - Hemodialysis
  - Peritoneal
  - Transplant
  - Hospice
  - Access plan

Disclosures & Conflicts of Interest

Consultant:
- WL Gore
- CR Bard

Clinical Investigator:
- CR Bard/Lutonix

CiDA Access Innovation 2015
Contribution: RCO: Award of Distinction

NKF-KDOQI Guidelines 2006

- 1.1 Patients with a glomerular filtration rate (GFR) less than 30 mL/min/1.73m² (CKD stage 4) should be educated on all modalities of kidney replacement therapy (KRT) options, including transplantation, so that timely referral can be made for the appropriate modality and placement of a permanent dialysis access, if necessary.

- 1.3.1 A fistula should be placed at least 6 months before the anticipated start of HD treatments.
  - This timing allows for access evaluation and additional time for revision to ensure a working fistula is available at initiation of dialysis therapy. (B)

- 1.3.2 A graft should, in most cases, be placed at least 3 to 6 weeks before the anticipated start of HD therapy.
  - Some newer graft materials may be cannulated immediately after placement. (B)

Predictions?

- Progression to ESRD?
- Outcome of AV Access?
Predicting Progression to ESRD

- Historical rate of eGFR decline
- Proteinuria
- Underlying renal disease
  - Unfavorable: Diabetes
  - Favorable: Hypertension, PKD

Relationship Between CKD, Proteinuria & Risk of ESRD

Iskandrian K, et al., AJKD 2004; 44:806-814

Predicting Access (AVF) Outcome

- Examination
- Vessel mapping
- Algorithm

Risk of Fistula Failure to Mature

<table>
<thead>
<tr>
<th>Risk Categories</th>
<th>Low risk</th>
<th>Moderate risk</th>
<th>High risk</th>
<th>Very high risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>25%</td>
<td>35%</td>
<td>52%</td>
<td>71%</td>
</tr>
<tr>
<td>Age&gt;65</td>
<td>+2</td>
<td>+1</td>
<td>+1</td>
<td>+1</td>
</tr>
<tr>
<td>PVD</td>
<td>+3</td>
<td>+2</td>
<td>+1</td>
<td>+1</td>
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<td>CAD</td>
<td>+2.5</td>
<td>+2</td>
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<td>+1</td>
</tr>
<tr>
<td>White</td>
<td>-3</td>
<td>-3</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>Total</td>
<td>0 to 10.5</td>
<td></td>
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</tbody>
</table>

The percentage of primary failure (PF) in each risk category were as follows: Low risk, 25%; moderate risk, 35%; high risk, 52%; and very high risk, 71% (P < 0.0001, trend).

Pick Your Poison?

Create & maintain AV access in patient who may not need dialysis (now or ever)?

Versus

Fail to create AV access in patient who then develops need for dialysis?

Case #1: Folly of Early AVF

- 77 year old black woman seen in 2003
  - Severe longstanding hypertension
  - Progressive chronic kidney disease
    - Creatinine rising over past year
      - 1.8 mg/dL (eGFR 33 ml/min) to 3.6 (eGFR 15 ml/min)
  - Renal Artery Stenosis: PTA/Stent Aug 2003
  - Basilic transposition AVF created Oct 2003
    - Lok Score: 3+3+3 = 9 (69% risk failure to mature)
Summary 2003-2013

Outcome: Fistula Folly

- Felt fine, highly functional, independent
- Stable or slowly progressive CKD Stage 4/5
- Dialysis never required
  - Decided against dialysis if/when she reaches ESRD
  - No AVF re-established
- 2014 died of stroke at age 88

Indications for Initiation of Dialysis

- Symptomatic renal failure
  - i.e. clinical syndrome of “uremia”
  - Not high BUN or Creatinine alone (“azotemia”)
- Volume overload
- Hyperkalemia
- Metabolic Acidosis
- Low GFR alone?
  - Stage-V CKD
  - eGFR <15 ml/min
- Not readily controlled by medical & dietary interventions

Percent distribution at initiation, by eGFR level (ml/min/1.73 m²)

Early vs. Late Initiation Dialysis

Cooper, et al. NEJM 2010

- Australia
- Randomized trial
  - 828 patients CKD-5
- Early Initiation
  - eGFR 10-14 ml/min
- Late Initiation
  - eGFR 5-7 ml/min
- Primary outcome
- Death

Initiating Dialysis Early And Late

“IDEAL” Trial
Case #2: Delayed Initiation of HD

- 65 year-old male
- Progressive CKD-5
- ADPKD
- Creatinine/eGFR
  - 2008: 5.5 mg/dL 11 ml/min
  - 2009: 7.5 mg/dL 7 ml/min
  - 2010: 9.8 mg/dL 5 ml/min
  - 2011: 11.0 mg/dL 4 ml/min
- Working full time in a vigorous occupation
- Very compliant with diet
  - Low protein
  - Low potassium
  - Low phosphorus
- Very resistant to dialysis
  - Functional AVF
    - Created September 2009
  - Refused HD x 2 years
  - "Doc, am I going to die tomorrow if I don’t start dialysis now?"

Avoiding Catheters: The Elephant in the Room!

- Delayed initiation of dialysis
- Can patient survive without added morbidity or mortality waiting for AV access to be created, healed, and/or matured?
  - Ideal AV fistula: 6 weeks
  - "Complex" AVF: 2-6 months
    - 2-stage procedure
    - Extensive “BAM”
  - Typical Graft: 2-4 weeks
    - "Early-stick" graft immediate

“STAT”AV Access

- Transposed forearm cephalic vein AVF
  - One month post-op:
  - Requirement: Surgeon who can & will:
    - Expedite surgery
    - Make something that works

Case #4: Path of Least Resistance (PLR) vs. Path of Optimal Care

- 84 year-old woman
- CKD-5, HTN
- CHF, cardiomyopathy
  - L-AICD
- RUA graft placed 2014
  - Thrombosed uncertain duration
- Recurrent admissions for CHF and/or hyper-K
  - Not “sick”
- Nephrologist
  - Wants to start HD now
- PLR: Refer for tunneled venous HD catheter
- Interventional doctor
  - PLR: Place TDC
  - Optimal Care
  - NO TDC
  - Attempt RUA graft thrombectomy (failed)
    - Urgent “early-stick graft”
    - Manage CKD/CHF medically

Implications for Interventional Physician

- Surgeon
- Interventional Radiologist
- Interventional Nephrologist
- Nephrologist:
  - “You NEED dialysis”
  - Timing of dialysis initiation not evidence-based
  - RARELY as urgent as the nephrologist claims

Typically have little input into decision to initiate hemodialysis