Use of Indirect Access Sites For AV Access Intervention: *Transjugular Approach*

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**Disclosures:**
- Advisory Committee & Vascular Access QI Group
- New York State Department of Health Office of Quality and Patient Safety (OQPS)
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- GE OEC Surgery Medical Advisory Board

**AV Access Interventions**
Typically performed with a direct puncture of the fistula

**Disadvantages of the Direct Approach**
- Crossing catheters technique
  - Awkward/Cumbersome
    - Obstruct flow
    - Dead space behind introducers "trapped clot"
    - Radiation exposure: hands in field
    - Access-site complications
      - Suture-site necrosis, infection
      - Pseudoaneurysm

- Prolonged procedure time
  - Hemostasis (high-pressure segment)

- Immature Fistulas
  - Hematoma
  - Spasm at introducer site
    - Pseudo-stenosis
    - Decreased flow
    - Thrombosis

**Arterial Access**
- Immature avf
- Brachial
  - Diagnostic or therapeutic
- Radial, Ulnar
- Femoral

**Options for Alternative Access Sites**
Venous Access

- Tributaries - targets of opportunity
- Internal Jugular Vein

Options for Alternative Access Sites...

Transjugular Approach

- First series reported by Zaetta 1998*

Advantages over direct puncture
- Avoid cumbersome access
- Keep operators hands out of x-ray beam
- No dead space (vs. crossing sheaths)

Transjugular Approach...

Advantages/Benefits ...
- If intervention unsuccessful: convert IJ access to TDC

Technical Challenges
- Crossing valves
- Can be difficult to access cephalic vein (snare)
- Risk of IJV thrombosis?

Transjugular Approach ...

Indications
- Direct puncture difficult/cumbersome
  » Access with short cannulation segment (<5cm) (introducer too close to stenosis)
  » Extensively stented access
  » Inflow pathology requiring retrograde approach
  » Clotted access

Technique
- Micropuncture access of IJV
  » Ipsilateral or contralateral
- 7 French, 10 cm sheath
- Reverse-curve catheter “Sos-Select” “Cobra C-2”
- Glidewire
Technique...
- Cannulation of outflow vein

If unable to cross into cephalic vein:
- Snare Technique
  - Antegrade micropuncture of cephalic vein
  - Advance .018 wire
  - Snare wire
  - Exchange for 25-cm sheath

Literature Review: Transjugular Approach

10 Publications
- 7 Retrospective studies
  - Thrombectomy (86 cases)
  - Immature AVF (90 cases)
  - Dysfunctional access
  - Pseudoaneurysms

Ferral 2018: Transjugular Venous Approach for Endovascular Interventions in Hemodialysis Grafts and Fistulas of the Upper Extremities

Indications for Procedure (n=30)
- Declot 13/43%
- Complex juxtaanastomatic stenosis 13/43%
- Nonmaturing AVF 2/7%
- Bleeding pseudoaneurysm 2/7%

2018: Ferral & Alonzo, Evanston, IL
Transjugular Venous Approach for Endovascular Interventions in Hemodialysis Grafts and Fistulas of the Upper Extremities
### Access Approach

- Ipsilateral IJV 29
- Contralateral IJV 1

### Results

- Technical success 97% (29/30)
- Snare 13% (4/30)
- TDC inserted (AVF not usable) 7% (2/30)

### Complications

**IJV Thrombosis**

0% (0/30)

### Case Studies

**Case Studies: Immature AVF**

- 68 year old female
- Partially occluded, immature left upper arm AVF

**Case Studies: Immature AVF...**

Partialy occluded, nonmature left upper arm AVF...

Initial Antegrade Fistulagram:

- Outflow vein: multiple stenoses, thrombus
- JAAS distal to access point (inaccessible)
Partially occluded, nonmature left upper arm AVF...

4mm PTA - 018 System – Sheathless technique

Outflow vein: still small
Arterial end: not treated

2 Weeks Later: Staged Transjugular Approach

Partially occluded, nonmature left upper arm AVF...

Patent central veins (CO₂ contrast)

Partially occluded, nonmature left upper arm AVF...

Increased diameter overall
Residual arterial end stenosis

Case Studies: Ruptured Pseudoaneurysm

Martin Rabellino, MD et al.
Buenos Aires

- 89 year old male
- Basilic transposition with ruptured pseudoaneurysm @ infiltration site

Case Studies: Ruptured pseudoaneurysm ...

Fistulagram via femoral approach

Case Studies: Ruptured pseudoaneurysm ...

Pseudoaneurysm

Tandem outflow stenoses
Case Studies: Ruptured pseudoaneurysm …

Jugular approach

Femoral artery catheter

Case Studies: Ruptured pseudoaneurysm …

Venous outflow s/p PTA

Covered stent deployed via jugular access

Summary and Conclusions

Transjugular Approach

A useful but underutilized technique

Advantages

- Single-puncture intervention
- Does not involve outflow vein
- Simplified hemostasis
  - Does not effect access Q
  - Low pressure system

Advantages …

- Deploy devices requiring large introducer sizes
- Less radiation to the operator
- Can convert to TDC if needed
- Useful technique for
  » Fistula maturation
  » Thrombectomy
  » Access maintenance

Go for the Jugular !