Distal Left Radial (dLRA) to Peripheral Interventions

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Disclosure

Speaker name: Vamsi Krishna

I have the following potential conflicts of interest to report:

☒ Consulting (Terumo, Abbott, Medtronic, CSI)
☐ Employment in industry
☐ Stockholder of a healthcare company
☐ Owner of a healthcare company
☐ Other(s)

☐ I do not have any potential conflict of interest
ADVANTAGES—FOR PATIENTS

• COMFORTABLE HAND POSITION, SPECIALLY FROM LEFT.
• SOME PATIENTS MAY PREFER LEFT WRIST OVER RIGHT.
• MINIMAL RISK FOR DISTAL ISCHEMIA.
• FREE MOVEMENT OF WRIST.
• GOOD FOR OBESE PATIENTS, PATIENTS WITH ARTHRITIS.
ADVANTAGES—FOR OPERATOR

• CAN STAND ON THE RIGHT SIDE OF THE PATIENT
• NO NEED TO RE ARRANGE THE ENTIRE ROOM
• SAFE DISTANCE FROM X RAY SOURCE AND LESS SCATTER FROM THE PATIENT.
• OPERATOR WORKS AT THE KNEE LEVEL FROM THE PATIENT.
• ALL ADVANTAGES OF LEFT RADIAL APPROACH FROM LEFT DISTAL RADIAL
• TRADITIONAL RADIAL IS PRESERVED FOR FUTURE USE.
Risk of DRA Occlusion by Arterial Diameter

- $< 1.8 \text{ mm inner diameter} \rightarrow \text{A/S ratio} < 0.8$
- $2 - 1.8 \text{ mm inner diameter} \rightarrow \text{A/S ratio} > 0.8$
- $\geq 2 \text{ mm inner diameter} \rightarrow \text{A/S ratio} > 0.9$

- DRA Diameter = RA Diameter (p=0.92), but Females < Males (p=0.02)
- A/S = Arterial inner lumen diameter / outer Sheath size in mm
Distal Left Radial Artery (dLRA)

1. dLRA offers advantages of enhanced ergonomics and comfort for operator and patient. The hand may be prepped with full pronation, rested on the patient’s mid-to-low abdomen.

2. A roll of 4” x 4” gauze or small towel can be held to keep the dorsal area opened, separating the thumb and first finger. The hand is prepped in this position and anesthetized, and access is gained—preferably with ultrasound. Through-and-through puncture is not recommended since needle contact with the periosteum is painful.

3. Distal left radial hemostasis differs from proximal hemostasis. Common, rigid hemostasis bands depend on immobility of the wrist. The dorsal hand is more mobile, and these devices may be loosened by movement. One solution is to apply rolled gauze to the access site, secured by a tight elastic bandage for two hours. If a device is used, the dedicated distal radial PreludeSYNC DISTAL™ band (Merit Medical Systems, USA) has been suggested. Shorter hemostasis times may be observed.
The three sites most often used for distal radial artery access are the (1) anatomic snuffbox above the scaphoid (left), (2) adjacent to the snuffbox at the trapezium bone (center), and (3) the first intermetacarpal space (right).
Figure 5. The visual analogy of the distal radial artery moving along a “playground slide” allows the physician to imagine the reverse course of the distal radial artery in the hand as a curvilinear downslide path, with multiple opportunities to enter the distal radial artery in the hand before reaching the bottom of the slide, which is the traditional radial artery puncture site.
Distal Radial Access

Femoral Access

~ 2.4 mm inner diameter artery
Distal Radial Artery

~ 8 mm inner diameter artery
Common Femoral Artery
Limitations

- The radial approach is not without limitations when it comes to peripheral interventions.
- Tortuosity of the innominate artery or the aorta, planned hemodialysis, and upper extremity occlusive disease can be a hindrance to treat the lower extremities from a radial access site.
- Longer fluoroscopy times have been reported with a radial approach when compared with a femoral approach.
- Sheath size is a limitation to a radial access and potentially limits the use of certain devices. There are conflicting reports to potential complications using transradial access and ranging from none to about 18% and mostly related to radial artery occlusion and dissection. A radial access however resulted in shorter hospital stay.
- A radial access may not provide enough wire or balloon support unless the sheath reaches the iliac arteries.
- Maintaining an activated clotting time between 250 and 300 s is particularly important with a radial access using long sheaths.
- May need alternative approaches (transpedal with transradial approach).
Cath Lab Set-up for Left Radial

Left Radial/Ulnar Access

Supporting the left arm
Medical Regimen

• Before procedure:
  – Sedation is paramount in transradial catheterization
    • Fentanyl and Versed
  – Local anesthesia with *small* amount (~2 cc’s) of subcutaneous lidocaine
  – I used ultrasound guided access for all my patients for both radial/ulnar/femoral/pedal. I will given the lidocaine via ultrasound guidance to increase the distance between the artery and the skin to improve ability to accurately engage as well as numb around the artery to avoid spasm
Medical Regimen

• Cocktail after arterial sheath insertion before flushing:
  – Heparin: (Intravenous only)
    • ≥70kg: 5000 units
    • <70kg: 3000 units
    • If pt on Coumadin w/ INR > 2, give 1000-2000 units
  – Nitroglycerin 200-400µg (Intraarterial)
  – Vasodilator: optional
  – Other vasodilators: diltiazem, papaverine or adenosine
  – Blood buffer: I do not sue
Medical Regimen

• After procedure, during the procedure, before sheath removal, optional:
  – I always give 200-400 mcg prior to removal of any radial or ulnar sheath based on recent data that this can reduce radial artery occlusion rates
The Procedure

• Traverse the vasculature of the arm using a “Baby J” tip Glidewire to help avoid branch vessels as well as navigate the subclavian into the descending aorta.

• If wire is moving easily, no need for fluoroscopic visualization until the thorax.

• Any catheter exchanges after this point should be performed over an exchange length wire. If unable to get into the descending aorta, use JR4 or IM catheter in the LAO position to help navigate tortuous anatomy.
R2P™ Portfolio Highlights

- R2P Destination Sleder
- R2P Slenguide
- Navicross
- R2P Metacross
- Glidewire
- R2P Misago
- Glidesheath Sleder
- TR Band
R2P™ DESTINATION Slender™
Guiding Sheath

- 6Fr Long-length Slender Guiding Sheath w/ coating
- 2 SKUs - 119cm & 149cm lengths
- Fully Hydrophilically coated
R2P Portfolio Review

**R2P™ GLIDEWIRE®**

- 0.035” Standard and Stiff and versions
- 21 SKUs
- 350, 400 & 450cm lengths
- Straight, Angled, 1.5mm & 3mm J Tip

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R2P Portfolio Review
R2P™ GLIDECATH®

- 4Fr Size, 150cm lengths
- 4 new SKUs
- Cobra 2, IMA, JR 4.0 & Pigtail tip shapes
- Straight, Angled & PV Multicurve already available

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R2P Portfolio Review

R2P™ METACROSS® RX
PTA Balloon Dilation Catheter

- 6Fr Size, Rapid Exchange system
- 3-8mm (D) x 20-200mm (L)
- 44 SKU’s
- 200cm Shaft Length

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Sheath comp: 6Fr
GW comp: 0.035”

Depth marker: 90cm, 120cm, 150cm

Usable length: 200cm
R2P® MISAGO® RX
Self-expanding Peripheral Stent
- 6Fr Size, Rapid Exchange system
- 6-8mm (D) x 40-150mm (L)
- 16 SKU’s
- 200cm Shaft Length

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R2P Portfolio Review
R2P™ CROSSTELLA® RX
PTA Balloon Dilatation Catheter

- .018” Rapid Exchange PTA Balloon
- 5 Fr sheath compatibility
- 2 – 6 mm (D) x 40-200 mm (L)
- 200cm shaft length

Plain Old Balloon Angioplasty (POBA)

- Smaller, distal lesions where an 018” or 014” wire is needed for crossing via radial artery access

Post-Dilatation After Atherectomy

- An 014” wire is typically used in atherectomy procedures and a balloon catheter is used for vessel post-dilatation
R2P Portfolio Review

TR Band® Radial Compression Device

- Dual balloons for accurate compression of the radial access site
- Air titration provides a more precise way of maintaining hemostasis of the radial artery.
- Leading radial hemostasis device in the US*
Current Procedural Considerations

• Atherectomy is limited to CSI via the transradial approach
• For taller patients, may not be able to reach distal SFA/popliteal artery
• Equipment delivery limited to 6 Fr delivery via radial approach
• Based on procedural experience, has been found to be an excellent alternative to femoral access guided procedures
Laser and IVUS can be used up to 150 cm shaft (iliacs, CFA, Prox SFA, renals, mesenterics)
R2P Case #1

• Pt JT is a 67 year old Female with DM (HgBA1c 7.9%), HTN (average SBP ~136 mmHg), CKD III (GFR 47), HLD (LDL 89 on high intensity statin), known PAD (on ABI without prior intervention), CAD s/p CABG in 2011(CCSC 2) presenting with claudication Rutherford IV, current smoker, unable to walk more than 50 feet.
• She is 5 foot 4 and weighs 160 lbs
• ABI is 0.67 to the right leg
• Ultrasound should Monophasic flow throughout the R SFA with patent tibial vessels (DP and PT)
• Pt unable to tolerate pletal for more than 3 weeks (GI upset and HA)
Case 1 Summary

- Left Subclavian Self Expanding 7 mm stent deployed and post dilated (this was prior to Misago, used Medtronic 5 F 150 cm self expanding stent)
- R CFA and prox SFA atherectomy with 1.5 mm CSI burr and angioplasty with 5 mm Metacross balloon for 5 minutes at 10 atm (nominal). Pressure gradient post procedure was < 10 mmHg, starting was 50 mmHg
- 3 V runoff to right foot
- Placed patient in Cardiac Rehab for Symptomatic PAD for 3 months
- ASA + Plavix for 3 months then used Xarelto 2.5mg PO BID + ASA 81mg daily based on COMPASS PAD (DM, CABG, CKD, PAD, HTN, HLD)
- Added Zetia 10mg daily + Rosuvastatin 40mg daily, started EPA 2 grams PO BID given TG > 135 based on REDUCE-IT trial and started patient on SLGT2 inhibitor based on CREDENCE data for CKD prevention and 3 point MACE reduction
- Post 6 week ABI: 0.91, blood pressure in both arms equal
- Case time: 49 minutes, pt discharged 30 minutes post procedure, distal radial 2 peripheral
R2P Case #2

• 59 year old black female, known occluded L brachial artery from trauma, hx of repeated PAD procedures including prior R SFA CTO and L SFA CTO interventions with stents, known iliac stents that had prior issues due to up and over catheters, presents with cold right leg and severe pain at rest. Smoker, compliant with medical therapy (DAPT) but recently taken off due to GI issues. ABI 0.4 to right leg.

• Pt is 5 foot 5 inches, weighs only 105 lbs. History of RP bleed and prolonged hospital stays due to femoral access

• Unable to tolerate statins due to myalgias
Case 2 Summary

- R CFA and SFA CTO angioplasty with 5 and 6 mm MetaCross 200 mm for 5 minutes at 10 atm (nominal)
- CSI 1.5 mm burr to distal SFA – P2 POP lesion followed by 4 mm MetaCross 200 mm for 4 minutes at 8 atm
- 3 V runoff to right foot
- Placed patient in Cardiac Rehab for Symptomatic PAD for 3 months
- Plavix monotherapy based on TEG with Platelet mapping (mA < 47 mm)
- Start PCSK 9 Inhibitor given intolerance to statin – LDL now 36, smoking cessation with Wellbutrin successful, > 12 months without re intervention to right leg
- Post 6 week ABI: 0.82 R
- Current limitations: Pneumbra shaft length 140-150 cm and IVUS 150 cm. I would recommend both normal for acute/subacute leg and ISR.
- Case time: 51 minutes, admitted to observe for bleeding and TEG platelet mapping
R2P Case #3

- 81 year old female, smoker – down from 1 pack to 5 cigarettes, HTN, HLD with claudication < 100 feet, weakness in her thighs when walking referred for endovascular eval.
- Ultrasound shows monophasic flow through out left leg ABI L 0.8 → 0.5 with exercise (50 heel raises)
- Pt is 5 foot 3 inches, weighs only 100 lbs. Frail appearing
- Smoking cessation performed with Chantix/Nicotine patches prior to procedure
Case 3 Summary

- Lostial common iliac lesion s/p CSI 1.75 mm burr and 8 mm balloon angioplasty
- s/p Medtronic 8 X 57 mm balloon expandable stent post dilated with 9 mm balloon, no gradient post stenting < 10 mmHg
- Pt quite smoking, ABI in both legs 0.99/1.02, no drop with exercise
- DAPT for 3 months and now only on ASA + STATIN, LDL goal < 70, using rosuvastatin 40mg daily.
- Triphasic flow to both legs with no symptoms
- Case time: 24 minutes
- Pt left home 1 hour post procedure
The anatomical snuffbox contains the distal radial artery, a sensory nerve and superficial cephalic vein.

Distal radial is bordered by hard structures.

dRA and pRA are almost equal in diameter.

L dRA has significant advantages for patient and operator.

Can be used for iliacs, renals, mesenterics, carotid, coronary, SFA with current equipment and to help with CLI visualization.
Keys to Success for dR2P program

• There is a need for R2P technology today (decrease length of stay, decrease bleeds, reduce vascular complications, etc)
• Physicians need to be comfortable with transradial procedures and advocates for obtaining the latest technology to better patient care
• Hospitals/healthcare systems need to be educated
• Team effort between physicians, staff, and administration
Thank You
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