TERUMO LEARNING EDGE™

Beyond The Basics: Performing Radial STEMI Procedures

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TERUMO INTERVENTIONAL SYSTEMS

TIS-255-04082016

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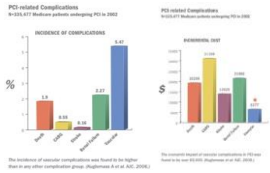
Objective

- Why Transradial PCI for STEMI?
- Perfusion Test and Patient Prep
- Radial Access
- Catheter Selection and Manipulation
- Hemostasis

Vascular Access Complications

Hospital Resources Consumed in Treating Complications associated with Percutaneous Coronary Interventions



For patients with only one complication, vascular complications were more common than all others combined (4.9% vs 3.3%)

Estimates of the adjusted incremental hospital costs of treating any acute complication varied from $4k-$33k per patient

Kugelmass A, Cohen D, Brown MD, Simon A, Becker E, and Cutler S. American Journal of Cardiology. 2006; 97: 322-327

Reduction in Bleeding Complications

Retrospective analysis of 38,872 patients TRA showed 50% Reduction in Transfusion Rate TRA reduced 1yr Mortality from 3.9% to 2.8%	MORTAL
TRA n = 3507 TFA n =3514 STEMI radial showed 40% Reduction in primary outcome STEMI/ACS radial showed 63% Reduction in Major Vascular Complications	RIVAL
STEMI TRA (n = 500) vs. TFA (n = 501) 62% Reduction of Access site bleeding complications with TRA vs. TFA	RIFLE-STEACS

*The Association Of Arterial Access Site At Angioplasty With Transfusion And Mortality: The M.O.R.T.A.L Study: (Mortality benefit of Reduced Transfusion After PCI via the Arm or Leg); Alex J Chase, Eric B Fretz, William P Warburton, W Peter Klinke, Ronald G Carere

Effects of Radial Versus Femoral Artery Access in Patients With Acute Coronary Syndromes With or Without ST-Segment Elevation. Shamir R. Mehta, MD, MSC, Sanjit S. Jolly, MD, MSC

Radial Versus Femoral Randomized Investigation in ST-Segment Elevation Acute Coronary Syndrome The RIFLE-STEACS (Radial Versus Femoral Randomized Investigation in ST-Elevation Acute Coronary Syndrome) Study. Enrico Romagnoli, MD, PHD, Giuseppe Biondi-Zoccai, MD,† Alessandro Sciahbasi, MD

Radial Continues to be Supported by Evidence

Minimizing Adverse Haemorrhagic Events by Transradial Access Site and Systemic Implementation of Angiox (the MATRIX Trial)[1]

Study Methods

- Randomised, Superiority trial
- 8404 Patients, 74 Centers
- Co-primary End Points
  - MACE
  - NACE
- Secondary End Points
  - Individual components of Composite out comes
    - All cause Mortality
    - Stroke
    - MI
    - Bleeding

Results

- Radial garners superior outcomes
  - Radial as compared with femoral access reduces NACE through a reduction of bleeding and all-cause mortality
- Co-Primary End Points
  - 15% relative reduction in MACE
  - 17% relative reduction in NACE
- Secondary End Points
  - 28% Reduction in all-cause mortality
  - 33% reduction in Bleeding

Epub 2014 Jan 7

Transradial PCI for STEMI

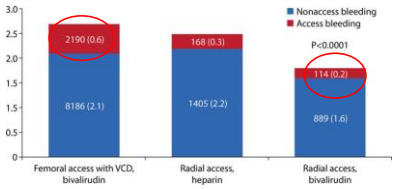
The Prevalence and Outcomes of Transradial PCI for STEMI

- Key Points:
  - The authors concluded that the wider usage of TRI for STEMI may significantly improve patient outcomes.
  - TRI patients were also significantly less likely to have vascular complications than the femoral PCI population.
  - TRI was associated with a lower risk of bleeding and in-hospital mortality while there was no difference in procedural success.

Bakbanov DV, Kaltenbach LA, Marso SP et al. J Am Coll Cardiol. 2013 Jan 29;61(4):420-6

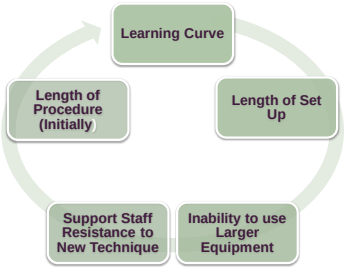
Transradial and Bivalrudin

This figure demonstrates the rate of percutaneous coronary intervention-associated bleeding in 501,017 patients grouped by vascular access and anticoagulation.



Bakbanov D V et al. Circ Cardiovasc Interv. 2013;6:347-353

Common Hurdles with Transradial PCI for STEMI



Transradial Advantages

- Benefits of radial access for all patients, especially STEMI
- When to start performing radial STEMI?
- Why to perform radial STEMI?
- Discussing with your Cath Lab Staff in advance of radial STEMI case

Room Set-up and Prep

Room Set up – Right Radial

Some physicians will access radial artery with arm at 90 degrees. Once sheath is inserted and secured, bring right arm in near right groin site

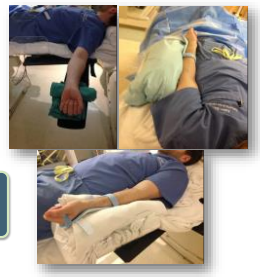
Other physicians works in same plane as wrist with equipment easily accessible

Room Set up – Left Radial

Begin with the arm adducted 90 degrees

To work from the patient's right, use pillows, straps or blankets to elevate arm

Assess position for patient comfort and compliance prior to prepping site



Room Set up – Left Radial

Access the left radial with arm positioned at 90 degrees to patient

Position the arm near patient's left groin if working from the patient's right

Room Set up – Considerations

- **Shave and prep medial to lateral; from the mid forearm to the mid palm**
- **Shave the upper arm if RHC is to be performed**
- **Consider shave and or Prep femoral access site.**
- **Femoral access can prove useful for emergent access of the femoral artery or vein**

Administering Heparin to Avoid RAO

Comparison of the Effect of Intra-Arterial Versus Intravenous Heparin on Radial Artery Occlusion After Transradial Catheterization

Key Points:

- No statistical difference between intra-arterial and systemic heparin administration in regards to RAO.
- 500 consecutive patients
- Early RAO 5.6% (ia) vs. 6% (systemic)
- Late RAO 4% (ia) vs 3.2% (systemic)

Semir Panchaly: Volume 104, Issue 8, Pages 1083-1085 (15 October 2009)

Radial Artery Spasm

Reasons

- Vascular Trauma (Access)
- Friction as a result of catheter movement or sheath removal
- Patient Anxiety

What Happens

- The vessel grips onto the catheter/sheath
- Difficulty of advancement or removal
- Gives great pain to the patient if the system is forced out

Radial Artery Spasm occurs in 2%-6% of patients

Radial Artery Spasm Prevention

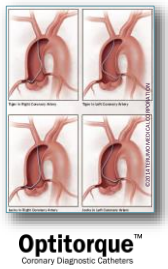
1. **Use of Hydrophilic sheath to reduce friction**
2. **Use of Smaller sheaths and catheters**
3. **Spasmolotic Cocktail (Nitroglycerin 200-400mcg, Verapamil 2.5-5mg). Consider alternate vasodilators/antispasmodic**
4. **Gentle Sedation**
5. **Additional vasodilators if needed**

Antispasmotic Cocktail

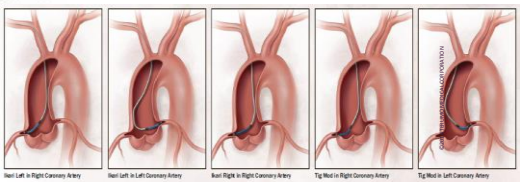
Verapamil is a very acidic drug. To reduce burning effect, Physician should consider diluting cocktail with the patient's blood in a 10-20mL syringe.
Other substitutions would be Nicardipene or Cardene

OPTITORQUE™

- Coronary diagnostic catheter
  - Available in 5 Fr and 6 Fr catheter sizes
  - Radial shapes are designed to eliminate catheter swaps
  - Shaft with 2-ply stainless steel braid designed for 1-to-1 torque and accurate placement
  - Large lumen for high contrast flow
  - Atraumatic soft tip
  - Designed to provide greater visibility around the ostium and lower contrast pressure from the end hole



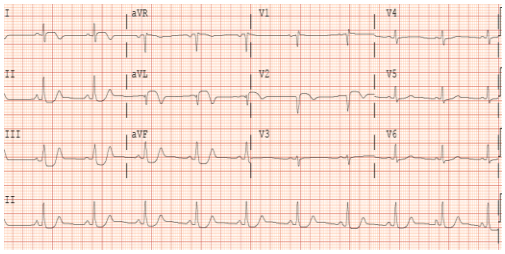
HEARTRAIL™ Guide Catheters



- Provides multiple points of contact against the contralateral wall
- Ikari left offers versatility – for use in LCA and RCA
- Optimal STEMI guide cath to reduce DTB

CASE 1

- 57 y/o morbidly obese WF with a h/o CAD s/p Anterior MI LAD stents 2014, HTN and HLD presented to hospital for worsening chest pain. Troponin 0.28



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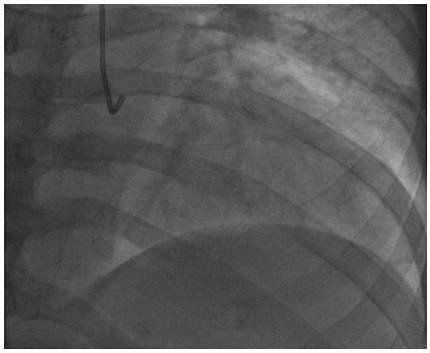

TIG 4.0 CATHETER

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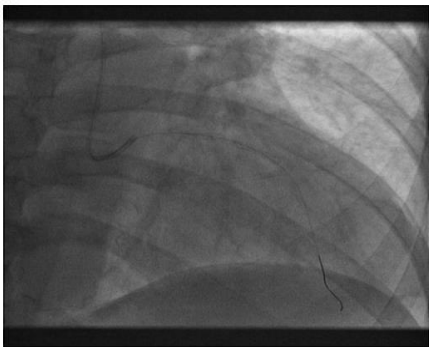

IKARI 3.5 L GUIDE RUNTHROUGH® NS Coronary Guidewire

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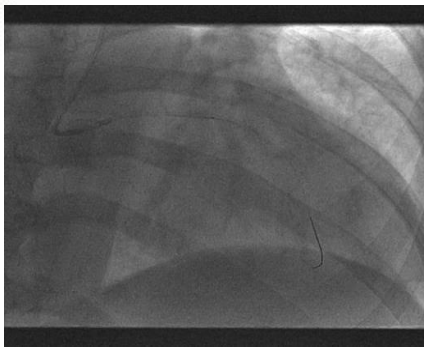

ASPIRATION THROMBECTOMY

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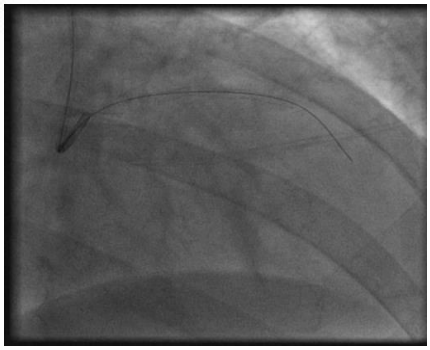

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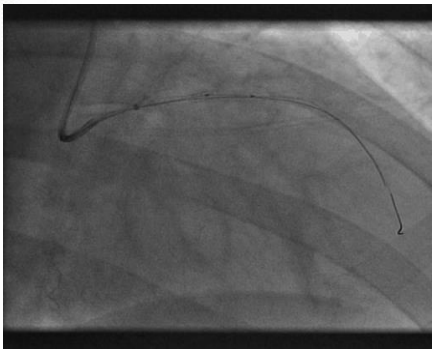

EXTRA SUPPORT WITH 6F GUIDELINER

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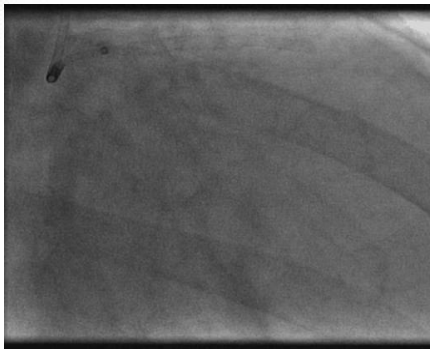


POLLING QUESTION

- Which is the strongest independent predictor for radial artery spasm?

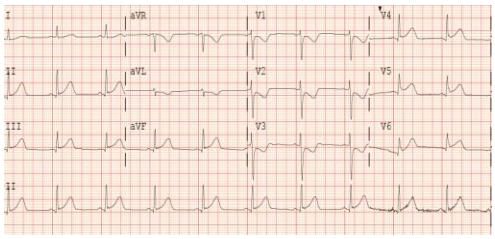
A. Female gender
B. Diabetes
C. Hypertension
D. Small radial artery diameter
E. Unsuccessful access at first attempt

Answer

D. Small radial artery diameter

CASE 2

- 48 y/o Hispanic female with a h/o Diabetes mellitus, HTN, and HLD developed shortness of breath and crushing chest pain after dinner. Troponin 0.20



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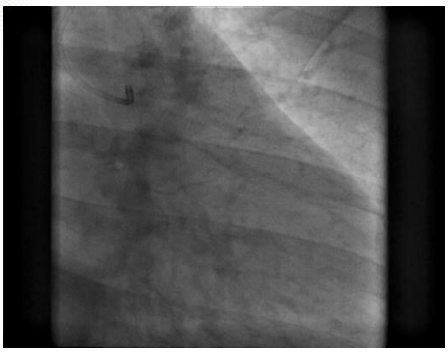

IKARI 3.5 L GUIDE_ RUNTHROUGH® NS Coronary Guidewire

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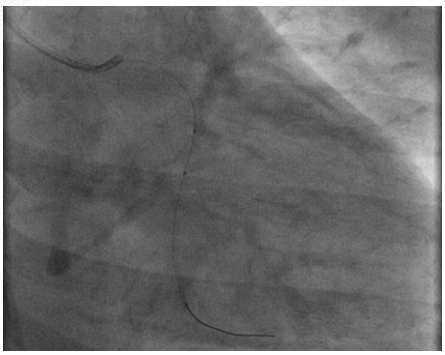

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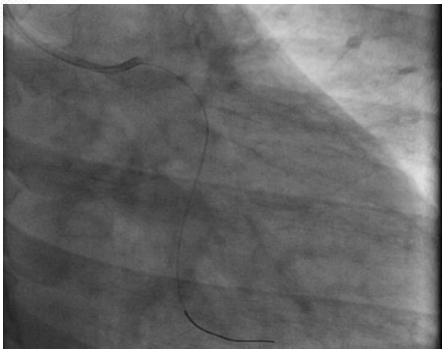

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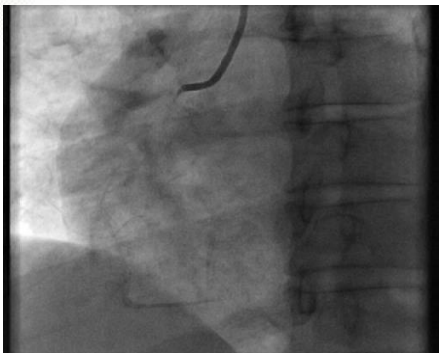

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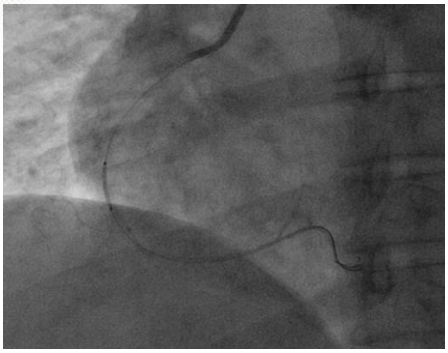

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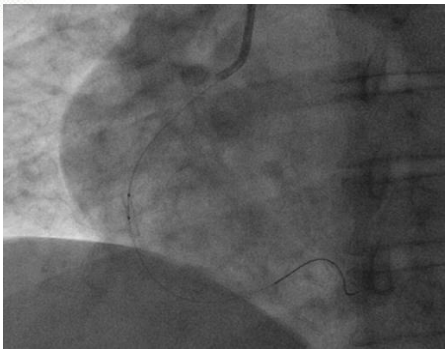

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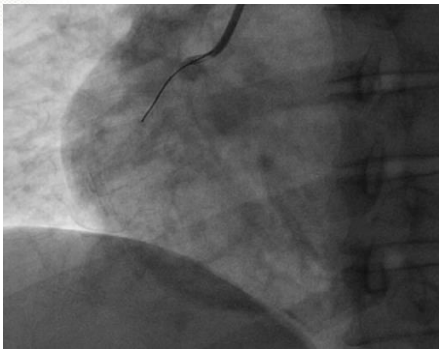

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POLLING QUESTION

- Which of the following is a predictor of RAO (Radial arterial occlusion)?
- A. Female gender
- B. Length of procedure
- C. Lack of blood flow during compression D. Insufficient anticoagulation
- E. Ratio of artery diameter/ diameter of sheath < 1
- F. All of the above

Answer

- F. All of the above

Radial Artery Occlusion (RAO)

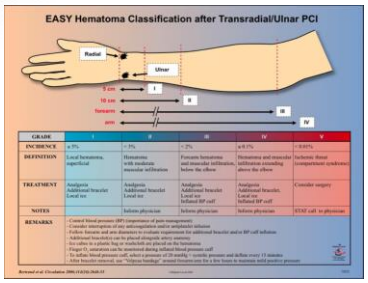
Remaining Challenges and Opportunities for Improvement in Percutaneous Transradial Coronary Procedures

Key Points:

- The authors grouped strategies aimed at minimizing the risk of arterial occlusion into three categories: Proven to Reduce Risk, May Reduce Risk, or Not Shown to Reduce Risk.
- The Four "Proven to Reduce Risk" strategies were:

Rao SV, Bernat I, Bertrand OF. Eur Heart J. 2012 Oct; 33(20):2521-6

Complications



While rare, complications from Transradial Access can occur.

RAO Dosing Considerations

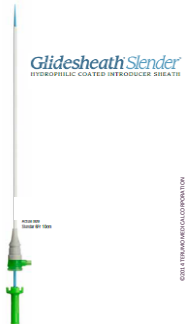
- The current Society for Cardiac Angiography and Interventions best practice guidelines suggest a heparin dose of 50 units/kg (up to a 5,000-unit maximum dose) for a radial diagnostic procedure.
- Prophet Study used anticoagulation protocol of 50 units/kg to a maximum dose of 5000 Units

Rao SV, Tremmel JA, Gilchrist IC, et al. Best practices for transradial angiography and intervention: a consensus statement from the society for cardiovascular angiography and intervention's transradial working group. Catheter Cardiovasc Interv. 2014;83:228-236

Pancholy S, Coppola J, Patel T, Roke-Thomas M. Comment in Catheter Cardiovasc Interv. 2008 Sep 1;72(3):341-2

GLIDESHEATH® SLENDER™ Introducer Sheaths

- The smallest 6 Fr sheath on the market
  - Take advantage of compatibility with 6 Fr devices
  - Perform diagnostic and interventional procedures without upsizing to a larger sheath
  - Incorporates Terumo Glide Technology™ for ease of insertion and removal



6 Fr Glidesheath Slender is compatible with 6 Fr guiding catheter while maintaining outer diameter of current 5 Fr sheath

Catheter Selection & Manipulation

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Radial Hemostasis

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Radial Hemostasis

Prevention of Radial Artery Occlusion – Patent Hemostasis Evaluation Trial (PROPHET Study)

A Randomized Comparison of Traditional Versus Patency Documented Hemostasis after Transradial Catheterization

Conclusion

Patent hemostasis is successful in significantly lowering the incidence of radial artery occlusion after TRA, without compromising hemostatic efficacy

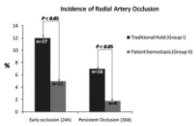

Fig. 1. Patent hemostasis leads to a significant decrease in the incidence of radial artery occlusion at 24-hr and 30-day follow-up.

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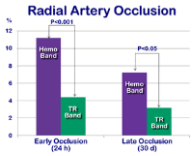
Pancholy S, et al Catheterization and Cardiovascular Interventions 72:335-340 2008

Radial Hemostasis

Impact of Two Different Hemostatic Devices on Radial Artery Outcomes after Transradial Catheterization

Conclusion

- TR BAND® Radial Compression Device provides equivalent hemostatic efficacy and a lower incidence of radial artery occlusion after transradial catheterization compared to the HemoBand.
- A device with a lower incidence of this complication is desirable over other available choices.



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Pancholy S. J Invasive Cardiol 2009 Mar; 21(3):101-4

Radial Hemostasis

At the conclusion of the procedure, a hemostasis device is recommended for access site management

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Radial Hemostasis

- Important to understand the "Patent" hemostasis technique.
- Close attention to placement of the TR BAND® Radial Compression Device
- Monitor duration of compression

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Radial Hemostasis

Once hemostasis is achieved transport the patient with the inflation syringe attached either to the patients chart or taped to the patient.

Thank you! Questions?