RADIAL ACCESS FOR FISTULAE ANGIOPLASTY: A MINIMALLY INVASIVE AND VERSATILE OPTION. CASE REPORT AND LITERATURE REVIEW

Faculdade de Medicina do ABC – Santo André – Brazil
Department of Vascular Surgery

Marcelo Franchini Giusti MD, MSc*

Anderson Nadiak Bueno MD, Erika Tadeu Dobrioglo MD, Simone Pedroso Jardim, Fernanda Uchiyama Golghetto Domingos MD, Jose Roberto Bonfim, Domenici Jr. MD, João Antônio Correa MD, PhD.
Disclosure

Speaker name:

MARCELO FRANCHINI GIUSTI, MD.

I have the following potential conflicts of interest to report:

☐ Consulting
☐ Employment in industry
☐ Stockholder of a healthcare company
☐ Owner of a healthcare company
☐ Other(s)

☒ I do not have any potential conflict of interest
INTRODUCTION

• Autogenous fistulae

• Recommended access to hemodialysis

• Frequent mid- and long-term complications
  ➢ Occlusive hyperplasia
  ➢ Outflow veins near to the anastomosis
INTRODUCTION

• NK-DOQI criteria for intervention
  • Hemodynamically significant stenosis (>50%)
  • Inadequate flow
  • Aneurysm formation

Brescia et al., N Engl J Med 1966
Ackad et al., Nephrol Dial Transplant 2005
Kokubo et al., J Am Soc Nephrol 2009
Le et al., J Vasc Surg 2015
INTRODUCTION

• Techniques for intervention
  • Direct puncture of the downstream vein
  • Antegrade arterial approach
INTRODUCTION

- Transradial access
  - Widely used in coronary procedures
  - Successful and secure
  - Treat inflow and outflow lesion at the same time, as well as multiple lesions along the fistula

Rahmatzadeh et al., Vascular 2014
CASE REPORT

• Patients
  • Mature and in use braquiocephalic fistulae

• Intervention required
  • Low or progressive decreasing dialysis flow rate (▼ 15%)
  • Progressive increase in static venous pressure (>120 mmHg)
  • Pulsatile or weak thrill
  • Poor hemostasis after dialysis
  • Swelling in limbs with vascular access
  • Aneurysmal formation
  • Excessive clots
  • Difficulty in accessing the fistula
  • Reduced dialysis adequacy (Kt/ V < 1.2 or URR < 65%)

al., Cardiovasc Intervent Radiol 2009
Le et al., J Vasc Surg 2015
Rahmatzadeh et al., Vascular 2014
CASE 1
# DISCUSSION

## Outcomes

<table>
<thead>
<tr>
<th>Author/Year</th>
<th>N</th>
<th>Procedures</th>
<th>Technical Success</th>
<th>Clinical Success</th>
<th>Primary Patency (1 - 3 months)</th>
<th>Primary Patency (6 - 12 months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chen et al. / 2009</td>
<td>131</td>
<td>154</td>
<td>61%</td>
<td>81.1% - 99%</td>
<td>75.3% - 84.3%</td>
<td>39% - 52%</td>
</tr>
<tr>
<td>Hong et al. / 2009</td>
<td>15</td>
<td>15</td>
<td>87.5%</td>
<td>87.5%</td>
<td>75%</td>
<td>56.2%</td>
</tr>
<tr>
<td>Jeon et al. / 2009</td>
<td>7</td>
<td>7</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>60%</td>
</tr>
<tr>
<td>Kawarada et al. / 2006</td>
<td>11</td>
<td>13</td>
<td>100%</td>
<td>100%</td>
<td>82% ± 12%</td>
<td>64% ± 15%</td>
</tr>
<tr>
<td>Le et al. / 2015</td>
<td>40</td>
<td>50</td>
<td>88%</td>
<td>84%</td>
<td>88.5% - 83%</td>
<td>83%</td>
</tr>
<tr>
<td>Lin et al. / 2008</td>
<td>101</td>
<td>165</td>
<td>89.7%</td>
<td>84.2%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Rahmatzadeh et al. / 2014</td>
<td>30</td>
<td>30</td>
<td>93%</td>
<td>-</td>
<td>100%</td>
<td>88.4% - 32.8%</td>
</tr>
<tr>
<td>Wang et al. / 2006</td>
<td>49</td>
<td>50</td>
<td>91.3%</td>
<td>96%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Wu et al. / 2009</td>
<td>48</td>
<td>48</td>
<td>96%</td>
<td>96%</td>
<td>92% - 77%</td>
<td>55% - 44%</td>
</tr>
</tbody>
</table>
DISCUSSION

• Patients – inclusion criteria

• Palmar arch patency
  ➢ Allen’s test
  ➢ US-Doppler

• Presence of radial pulse

Rahmatzadeh et al., *Vascular* 2014
DISCUSSION

• **Advantages**
  - Single puncture allows to treat all/multiple lesions
  - Easy to achieve hemostasis
  - Hemodynamic monitoring to gauge immediate success
  - Reduced radiation exposure
  - Better wire manoeuvrability
  - Immediate deambulation and early discharge.
  - Repeated uses

Rahmatzadeh et al., *Vascular* 2014
Agostoni et al., *JACC Cardiovasc Interv* 2014
Jolly et al., *Am Heart J* 2009
Bruecke et al., *JACC Cardiovasc Interv* 2009
Agostoni et al., *JACC* 2014
DISCUSSION

- Advantages

  Less complications

  - Transfemoral - 2.8% higher than transradial
    - Infection
    - Morbidity
    - Mortality

Rahmatzadeh et al., *Vascular* 2014
Agostoni et al., *JACC Cardiovasc Interv* 2014
Jolly et al., *Am Heart J* 2009
Bruecke et al., *JACC Cardiovasc Interv* 2009
Agostoni et al., *JACC* 2014
<table>
<thead>
<tr>
<th>Complication</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radial Artery Occlusion</td>
<td>2-18%</td>
</tr>
<tr>
<td></td>
<td>1.5-33%</td>
</tr>
<tr>
<td>Nonocclusive Radial Artery Injury</td>
<td>Common</td>
</tr>
<tr>
<td>Radial Artery Spasm</td>
<td>5-10%</td>
</tr>
<tr>
<td>Hand Ischemia</td>
<td>Extremely rare</td>
</tr>
<tr>
<td>Perforation</td>
<td>0.1%-1%</td>
</tr>
<tr>
<td>Pseudoaneurysm</td>
<td>&lt;0.1%</td>
</tr>
<tr>
<td>Nerve Damage</td>
<td>Extremely rare</td>
</tr>
<tr>
<td>Granuloma</td>
<td>2.8%</td>
</tr>
<tr>
<td>Compartment syndrome</td>
<td>0.004%</td>
</tr>
<tr>
<td>AV Fistula</td>
<td>Extremely rare</td>
</tr>
<tr>
<td>Bleeding/Transfusion</td>
<td>0.15%</td>
</tr>
</tbody>
</table>

Adapted from Kanei et. al, 2011[7–10]. and Rahmatzadeh et. al, 2014
DISCUSSION

• Disadvantages

• Longer learning curve
• Impossibility to use large profile devices
• Demand sufficient blood supply to the hand
• Entry site failure – anatomical variations
  ➢ Transfemoral 2.4% X Transradial 7.8%
• Inadequate catheter support or manipulation

Rahmatzadeh et al., *Vascular* 2014
Agostoni et al., *JACC Cardiovasc Interv* 2014
Spence et al., *Can J Cardiol* 2009
Jolly et al., *Am Heart J* 2009
Kanei et al., Catheter Cardiovasc Interv. 2011
Bruecke et al., *JACC Cardiovasc Interv* 2009
Agostoni et al., *JACC* 2014
CONCLUSION

• Radial access is feasible and secure with low rates of complications.

• Allows to treat both arterial and venous limbs, as well as anastomosis site or multiple lesions in one single puncture.
THANK YOU!

OBRIGADO!

DANKE!
RADIAL ACCESS FOR FISTULAE ANGIOPLASTY: A MINIMALLY INVASIVE AND VERSATILE OPTION. CASE REPORT AND LITERATURE REVIEW

Faculdade de Medicina do ABC – Santo André – Brazil
Department of Vascular Surgery

Marcelo Franchini Giusti MD, MSc*

Anderson Nadiak Bueno MD, Erika Tadeu Dobrioglo MD, Simone Pedroso Jardim, Fernanda Uchiyama Golghetto Domingos MD, Jose Roberto Bonfim, Domenici Jr. MD, João Antônio Correa MD, PhD.