PCI & Nursing Care
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Reperfusion Strategy

- Thrombolytic Therapy
- Catheter-base Intervention
PCI

1. Balloon angioplasty

2. Atherectomy

3. Stent implantation
Atherectomy is a minimally invasive endovascular surgery technique for removing atherosclerosis from blood vessels within the body. It is an alternative to angioplasty for the treatment of peripheral artery disease, with no evidence of superiority to angioplasty. It has also been used to treat coronary artery disease, albeit ineffectively.

**Uses**

Atherectomy is used to treat narrowing in arteries caused by peripheral artery disease.

**Technique**

Unlike angioplasty and stents, which push plaque into the vessel wall, atherectomy cuts plaque from the wall of the artery. While atherectomy is usually employed to treat arteries, it can be used in veins and vascular bypass grafts as well.

Atherectomy falls under the general category of percutaneous revascularization, which implies re-canalizing blocked vasculature via a needle puncture in the skin. The most common access point is near the groin through the common femoral artery (CFA). Other common places are the brachial artery, radial artery, popliteal artery, dorsalis pedis, and others.

There are four types of atherectomy devices: orbital, rotational, laser, and directional.

The decision to use which type of device is made by the interventionalist, based on a number of factors. They include the type of lesion being treated, the physician's experience with each device, and interpretation of the device's risks and effectiveness, based on a review of the medical literature.
Term Definitions

- **Primary PCI**: PPCI is referred as the initial method of treatment for acute STEMI.

- **Elective PCI**: EPCI is used to treat patient with symptomatic coronary artery disease to address blockage in both native vessels and bypass grafts.
Primary PCI

- Primary PCI is generally preferable to fibrinolytic therapy when time until treatment is short and the patient arrives at a high-volume, well equipped center with experienced operators and support staff.
Primary PCI cont...

• PCI is the best option for patients with cardiogenic shock and the only option for patients with contraindications to fibrinolytic therapy.

• Primary PCI or Rescue PCI for STEMI is Class I, Level evidence A.

• Primary PCI Should be performed as quickly as with the goal of door-to-balloon time 90 minutes.
Role of EMS in Early Reperfusion Therapy
Balloon Angioplasty  Stent Angioplasty

- Artery with plaque
- Catheter with un inflated balloon inserted
- Balloon inflated, plaque compressed
- Widened artery
- Artery
- Catheter
- Balloon
- Stent
- Plaque
- Closed stent
- Expanded stent
- Compressed plaque
Stent with Balloon Angioplasty

1. Build up of cholesterol partially blocking blood flow through the artery.
2. Stent with balloon inserted into partially blocked artery.
3. Balloon inflated to expand stent.
4. Balloon removed from expanded stent.
1. The balloon and stent are positioned in the narrowed part of the artery.

2. The balloon is inflated and the stent expands, pushing the plaque back against the artery wall.

3. The balloon is then deflated and removed, leaving the stent propping open the artery.

4. The widened artery improves blood flow to the heart muscle.
Stent type

1st generation
- Cypher
- Strut wall thickness 0.140mm

2nd generation
- Taxus
- Strut wall thickness 0.097mm
- Xience
- Strut wall thickness 0.081mm
- Endeavor
- Strut wall thickness 0.090mm

3rd generation
- Promus
- Strut wall thickness 0.081mm

Materials:
- Stainless Steel
- Cobalt Chromium
- Platinum Chromium
Stent type

Taxus

Fluoroscopy

Axial

Average

Curved MPR

Moghadamnia
Stent type

Xience

Fluoroscopy

Axial

Curved MPR

Average

Moghadamnia
Stent type

Promus

Axial
Fluoroscopy
Curved MPR
Average
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Moghadamnia
افراد پر خطر (High Risk)

1- سن بالای 60
2- زنان
3- درگیری 3 رگ
4- تنگی شدید LAD
5- درگیری قسمت ابتدایی LCX
6- CRF
7- وجود EF<30%
8- وجود CHF
Complications of PCI

Acute complications:

1. Coronary spasm
2. Coronary artery dissection
3. Acute coronary Thrombosis
4. Bleeding and hematoma formation at the site of vascular access
5. Contrast- induced kidney failure
6. Dysrhythmias
7. Vasovagal response during remove of sheath (hypotension- bradycardia- diaphoresis)
Secondary and Long-Term Prevention: Post-PCI

- **Acute stent thrombosis**: 24 hours incidence: 0.6%
- **Sub-acute stent thrombosis**: Days to weeks incidence: <5%
- **Late stent restenosis**: Up to 12 months incidence: 15%
- **Major adverse cardiac events**: First year incidence: ~20%
- **Other atherothrombotic events (all arterial beds)**: Life-long
Risk factors for In-Stent Restenosis
Risk factors for In-Stent Restenosis

•**A: Patient Factors:**
  1. DM
  2. Acute or chronic Kidney disease

•**B: Anatomic Factors:**
  1. Longer lesion (>20 mm)
  2. Small vessel diameter (<3 mm)
  3. Complex, branched lesions
Complications of PCI cont..

Late complications:

1. Restenosis after PCI (using drug-eluting stents decreased this complication)
2. Late thrombosis
Nursing Management

Monitoring for Recurrent Angina

1. Observe the patient for recurrent angina or ST elevation by use of appropriate monitoring lead.

2. Post procedure angina may be caused by transient coronary spasm or acute thrombosis.

3. Nitroglycerine infused and may by titrated to alleviate of CP.
Nursing Management cont...

Prevention of Contrast-Induced AKI

• Assessment of Kidney function tests
• Protective Strategies such as preprocedure hydration and infusion of sodium bicarbonate.
• After PCI hydration is important to maintain adequate flow through the kidney.
Nursing Management

Monitoring the vascular Access site

1. While the sheath is in place or removal, bleeding or hematoma at the insertion site may occur.
2. The nurse must be observes the patient for bleeding and swelling at the puncture.
3. Control of VS
4. Direct pressure for 15-30 min
5. CBR for 4-6 hour
Monitoring the vascular Access site

1. Use of new Vascular closure Devices.
Patient education

- Emphasis on use of antiplatelet agent
- Report of chest pain (2-14 day after stent placement myocardial infarction may be created.)
Figure 5. The sheath is inserted over the guide wire (top left) with a rotary motion (top right) and then flushed (bottom left). As shown here, a subcutaneous tunnel is made either over the guide wire or over the sheath.
Pseudoaneurysm of Common Femoral Artery
Figure 5. Extensive hematoma after femoral bleeding into soft tissues. Hematoma tracks down all soft tissue planes.
Figure 3. Tegaderm clear plastic bandage used to cover the sheath and secure it in place. Cut an “X” in the part placed over the sheath valve.
Angioplasty balloon (inflated).
Figure 1. Proper nicking and spreading of the skin track before puncturing will ensure success of closure.
Angioplasty performed using the radial artery (artery in the wrist).
خارج کردن این شیت که اغلب بعد از پروسیجر آنژیوپلاستی به تأخیر می‌افتد، همراه با درد و ناراحتی بیمار می‌باشد.

امروزه، به طور فزاینده ای خارج کردن شیت شریانی به صورت پروسیجر پرستاری رایج شده است.
Figure 4. Right posterior leg and heel wound.
با تشکر از توجه شما