



CAR Standard for Percutaneous Atherectomy

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I. INTRODUCTION AND DEFINITION

Percutaneous atherectomy is defined as mechanical removal of atherosclerotic plaque. The concept has been developed in the hope to overcome the limitations of PTA, specifically restenosis.

The ideal atherectomy device has not been designed yet, but the goal of atherectomy is to remove plaque without significant injury to the vessel and no distal embolization. Several devices exist. The "Simpson" directional atherectomy catheter is designed to restore the full dimension of the vessel lumen with a lateral "cutting window". Most of the other devices create a channel of a diameter equal to that of the catheter tip by using a rotary mechanism. Complementary angioplasty may be required depending on the vessel which is being treated. It should be kept in mind that the rate of restenosis is high with percutaneous atherectomy and that it should be considered complementary to angioplasty.

II. RADIOLOGIST QUALIFICATIONS

As for PTCA.

III. INDICATIONS AND CONTRAINDICATIONS

A. Indications

1. Directional Atherectomy

- a. Focal stenoses
- b. Eccentric stenoses
- c. Lesions associated with "blue toe syndrome"
- d. Excision of tissue for histological study
- e. Intimal flap
- f. Retained valve leaflets in venous bypass grafts

2. Rotational atherectomy

- a. Long segment stenosis or occlusion of the superficial femoral, popliteal or tibial arteries
- b. Massive pulmonary embolism
- c. Pharmacoaangiography: in diagnosis of occult gastrointestinal hemorrhage refractory to routine angiographic detection

B. Contraindications

1. See angioplasty of lower extremities
2. Acute angle of entry into the artery
3. Vessel too small

Care should be taken if a stenosis is close to a side branch, near a vessel bifurcation, or if the vessel is tortuous.

IV. EXAMINATION TECHNIQUE, PERFORMANCE AND RELATED MATTERS

A. Approach and methods

Heparin and vasodilators should be given routinely when performing percutaneous atherectomy.

1. *Directional atherectomy*

The device should be sized according to the expected vessel diameter. An appropriate length sheath should be introduced as close to parallel as possible into the common femoral artery in order to facilitate catheter introduction. When the device is being advanced, rotated, or removed, it should be done with the cutter fully extended into the housing to avoid embolization of tissue and the balloon should always be deflated.

2. *Rotational atherectomy*

Since numerous rotational atherectomy devices exist, the interventionalist should be thoroughly familiar with the device he or she is using and should follow the manufacturer's guidelines

B. Complications

With **directional atherectomy** the procedural complication rate is between 5 and 10%. The following complications have been described:

1. Hematoma at puncture site
2. Pseudoaneurysm at puncture site
3. Distal embolization
4. Thrombosis at atherectomy site
5. Pseudoaneurysm at treatment site

With **rotational atherectomy**, the precise complication rate depends on the particular device, but it is generally higher than with directional atherectomy.

1. Puncture site hematoma
2. Pseudoaneurysm at puncture site
3. Distal embolization
4. Thrombosis at atherectomy site
5. Dissection
6. Arterial perforation
7. Hemoglobinuria
8. Wound infection

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