Keywords: Atherosclerosis; Angioplasty; Stenting; Coronary arteryconsidered. bypass graing (CABG); Atherectomy; Plaque removal; Surgical intervention; Cardiovascular disease; Arterial blockage; Minimally invasive procedures; Cholesterol management

Stenting is o en performed in conjunction with angioplasty to provide additional support to the artery a er it has been widened. A stent is a small, mesh-like tube that is inserted into the artery to keep it

Introduction

Atherosclerosis is a progressive disease that leads to the buildupoen and prevent re-narrowing [3].

plaque inside the arteries, causing narrowing and hardening of these plaque inside the arteries, causing narrowing and hardening of these plaques of Stents vital blood vessels. As a result, blood ow to key organs, including

the heart, brain, and extremities, becomes restricted, increasing the Bare-metal stents (BMS): ese stents provide structural support risk of severe cardiovascular events such as heart attacks and strokeshave a higher rate of restenosis.

While lifestyle changes and pharmacological treatments like statins Drug-eluting stents (DES): ese stents are coated with and brates are the rst line of defense, they may not be su cient in medication that is slowly released to reduce the risk of restenosis by managing advanced cases [1]. Surgical interventions become necessary

when the disease progresses to a critical stage, posing a signi cant

risk to the patient's health. is article delves into the various surgicalProcedure and outcomes

options available for managing advanced atherosclerosis, focusing on Stenting improves the long-term success of angioplasty by reducing

angioplasty, stenting, coronary bypass surgery, and atherectomy.

Angioplasty

the incidence of restenosis. However, stents carry a risk of blood clot formation, which may require long-term use of blood-thinning

is removed [2].

Angioplasty, also known as percutaneous transluminal angioplasty

(PTA), is a minimally invasive procedure used to treat narrowed coronary artery bypass graing (CABG)

blocked arteries caused by atherosclerosis. e procedure involves

For more severe cases of atherosclerosis, where multiple arteries ar the insertion of a catheter into the a ected artery, typically through the groin or wrist, followed by the in ation of a small balloon at the blocked or the blockages are extensive, coronary artery bypass gra ing (CABG) is o en the preferred surgical solution [5]. CABG involves catheter's tip to widen the artery and restore blood ow. bypassing the blocked portions of the coronary arteries by using blood Procedure overview

vessels harvested from other parts of the body, such as the saphenou vein from the leg or the internal mammary artery. e balloon is in ated at the site of the arterial narrowing, pressing the plaque against the artery walls. is restores the artery's diameter and improves blood ow. In some cases, a stent is placed at the site to Corresponding author: Sophie Kate, Department of Atherosclerosis, Maastricht help keep the artery open a er the balloon is de ated and the cathetehiversity, Iran, E-mail: drsophiekate@dr.ir

Advantages and limitations

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lowering the risk of complications compared to more extensive itation: Sophie K (2024) Surgical Solutions for Advanced Atherosclerosis: surgeries. However, it may not be e ective for patients with extensive gioplasty, Stenting, and Beyond. Atheroscler Open Access 9: 277.

plaque buildup or for those with arteries that re-narrow over timeCopyright: © 2024 Sophie K. This is an open-access article distributed under the (restenosis). For these patients, angioplasty alone may not be su cieffirms of the Creative Commons Attribution License, which permits unrestricted and other options like stenting or coronary bypass surgery may be distribution, and reproduction in any medium, provided the original author and source are credited. Citation: Sophie K (2024) Surgical Solutions for Advanced Atherosclerosis: Angioplasty, Stenting, and Beyond. Atheroscler Open Access 9: 277.

Procedure overview

e surgeon creates a new pathway for blood ow by gra ing healthy vessels around the blocked arteries, ensuring that oxygen-rich blood can reach the heart muscle [6].

Indications for CABG

CABG is typically recommended for patients with multiple artery blockages, severe coronary artery disease, or when angioplasty and stenting are not viable options. It is also commonly performed in patients with diabetes, who are at higher risk of complications from angioplasty and stenting.

Risks and bene ts

While CABG is a more invasive procedure, requiring open-heart surgery and longer recovery times, it has been shown to signi cantly improve long-term outcomes in patients with severe atherosclerosis. However, like any major surgery, it carries risks, including infection, stroke, and heart attack during or a er the procedure [7].

Atherectomy

Atherectomy is a less commonly used procedure, designed to remove plaque directly from the arterial walls. is is accomplished using a catheter tted with a rotating blade or laser to cut away or vaporize the plaque [8].

Procedure overview

Atherectomy is o en used when plaque is too calci ed or hardened for angioplasty to be e ective. e device is inserted into the artery, and the plaque is shaved o or pulverized to clear the blockage.

Use cases and limitations

While atherectomy can be e ective in speci c cases, particularly when dealing with heavily calci ed plaque, it is not as widely used as other procedures due to the potential for complications, such as perforation of the artery or embolization of plaque fragments [9].

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