Use of microvena snare catheter in non-ST elevation myocardial infarction due to saphenous vein graft occlusive thrombi

Mohammed Balghith

King Abdulaziz Cardiac Center, King Saud Bin Abdulaziz Health Science University, National Guard, P.O. Box 22490, Riyadh 11426, Saudi Arabia

A 75-year-old man presented with acute coronary syndrome; he had a saphenous vein graft thrombosis. Percutaneous coronary intervention of bypass graft vessels is more challenging due to a higher incidence of periprocedural distal micro-emobilization and myocardial infarction. Current guidelines for percutaneous coronary intervention advocate the use of distal embolic protection devices, especially in patients with large thrombus burden, undergoing percutaneous intervention for vein graft disease. This patient was treated by manual aspiration of graft thrombus using a microvena catheter and successful clot removal was achieved. There are yet no best available therapeutic options for patients undergoing percutaneous coronary intervention of saphenous vein graft lesions.

Keywords: Saphenous vein graft, Aspiration catheter, Acute coronary syndrome, Angioplasty

Introduction

Saphenous venous grafts develop intimal hyperplasia, subsequent atherosclerotic degeneration and superimposed thrombus. This can lead to the clinical scenario of stable angina or acute coronary syndrome.

Given the risk of redo surgery, percutaneous treatment is generally preferred and accounts for 10–15% in most centers [1].

These interventions present unique challenges based on the soft and friable nature of the degenerated vein graft lesion, with increased tendency for distal embolization to produce no-reflow and myocardial infarction (MI).

Therefore, multiple device development strategies have been achieved and both aspiration and distal protection devices are used currently for treating such lesions [2]. In this patient we used a microvena catheter for thrombus aspiration which was safe and non-traumatic.

Case report

A 75-year-old male patient known to have diabetes mellitus, hypertension, dyslipidemia and coronary artery disease underwent coronary artery bypass graft (SVG) surgery in 2004, left internal mammary artery to left anterior descending artery, saphenous vein graft to right coronary artery and a jump (Y) graft to obtuse marginal 1 and obtuse marginal 2. He presented to the emergency department, complaining of chest pain and shortness of...
breath for 3 days. He was admitted to the coronary care unit with acute coronary syndrome, non-ST elevation MI and was started on ACS medication. An ECG showed lateral ST-T wave changes and his troponin I was positive 1.8 ng/ml, the echocardiogram showed moderate hypokinesis of posterolateral wall and the ejection fraction was 50%.

On the second day the patient underwent a coronary angiogram, which showed a patent saphenous graft to right coronary artery, patent left internal mammary artery to left anterior descending artery and patent Y – graft to obtuse marginal 2 and thrombus in the saphenous graft to obtuse marginal 1 (Fig. 1).

Percutaneous intervention was done using a manual suction technique with a small pediatric microvena snare catheter 4 french (ev3, Plymouth, Minnesota, USA). After a few attempts of manual suction the graft became patent (Fig. 2) and both small, organized and fresh clots were removed (Fig. 3). No angioplasty was done in this case and the patient was discharged from the hospital in very stable condition within a few days.

Discussion

Intervention has become an attractive alternative to re-operation in patients with SVG, but is also associated with less favorable acute and long-term outcomes compared with percutaneous coronary intervention (PCI) of native vessels due to a higher incidence of periprocedural microembolization and late restenosis.

In patients with a SVG as the culprit vessel in acute MI, the mortality within one year is 20%. However, recent studies indicate that vein graft MI carries a greater risk of mortality than those involving native coronary arteries, and that previous CABG surgery is an independent predictor of mortality [3].

The angiography results will determine the method of percutaneous coronary intervention. If a thrombus in the culprit artery or venous graft is detected then such lesions can be treated by aspiration or suction methods using an aspiration or thrombectomy device, which are available in well-known markets such as Export and Diver.
Catheters [4]. In some cases, distal protection devices were used, or recommended to be used, in large vessels with a large clot burden. The role of protection devices which reduce distal remobilization and no-reflow phenomenon have been well established and now are represented as a ‘must’ for almost all of the PCI in SVG procedures, manual suction using the same guiding catheter with deep engagement was used in some cases, mechanical thrombectomy devices like Angiojet or X-sizer are still in practice and in use by some cath labs [5], in some cases of big clots, invasive cardiologists prefer to use all methods together to minimize the distal embolization and decrease the no reflow phenomenon.

Other methods like conventional balloon angioplasty or using stents either BMS or DES. Some cases may be treated with covered stents [6].

In this case, patient was treated in the usual manner with anti-ischemic medication, and percutaneous graft intervention using microvena snare catheter, which is mainly used in pediatric cath labs for different purposes. It comes as a snare kit including a snare and a catheter. For this case, only the catheter itself was used. It has been used before in the same cath lab for three different adult cases with clots in native coronary arteries and it had been found that it is one of the least traumatic devices in such a case. Manual suction was applied through this catheter in a repeated manner. Following the manual suction, angiographic pictures showed a clear SVG. From this limited experience with microvena catheter, the results have been very good. The optimal strategy for treating these SVG lesions as yet remains unclear.

Conclusion

Saphenous graft thrombosis is a challenging pathology. It can be removed by available aspiration catheters using a small and less traumatic catheter such as the pediatric microvena snare catheter. In this patient the treatment was feasible and safe.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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