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Case report / Olgu Sunumu

Is internal mammary artery suitable for coronary artery bypass graft in pseudoxanthoma elasticum?

Psödoksantoma elastikumda internal meme arteri koroner arter baypas grefti için uygun mudur?

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In this article, we present a 49-year-old male patient with longstanding pseudoxanthoma elasticum who underwent CABG surgery with left internal mammary artery.

Key words: Coronary artery bypass grafting; internal mammary artery; pseudoxanthoma elasticum.

Bu yazıda uzun süredir psödoksantoma elastikum tanısıyla takip edilen ve sol internal meme arteri kullanılarak KABG cerrahisi uygulanan 49 yaşında erkek bir olgu sunuldu.

Anahtar sözcükler: Koroner arter bypass greftleme; internal meme arteri; psödoksantoma elastikum.

Pseudoxanthoma elasticum (PXE) is a rare disease of the connective tissue characterized by deranged elastic fiber metabolism and synthesis, resulting in fragmentation and calcification of the elastic fibers of the skin, eyes, and gastrointestinal tract along with the cardiovascular system.[1] Its prevalence is approximately 1/100,000.[1] Common cardiovascular manifestations include accelerated atherosclerosis, which may result in premature coronary artery disease (CAD), calcific vascular lesions, and endocardial fibrosis.[2] Pseudoxanthoma elasticum usually affects medium-sized arteries such as the internal mammary and radial arteries, which are the most frequently used arterial grafts in coronary artery bypass grafting (CABG). As a result, controversy continues to exist regarding the most suitable graft choice in patients with PXE.[3]

Although CABG in patients with PXE has been reported previously, very few of these studies involve the use of arterial grafts in PXE patients. Herein, we present a patient with longstanding PXE who underwent coronary artery bypass surgery via the left internal mammary artery (LIMA).

CASE REPORT

A 49-year-old male with a five-year history of hypertension and PXE was admitted to the hospital with a recent inferior infarction. His physical examination was unremarkable except for high arterial blood pressure (153/84 mmHg), and pathologic Q waves were present in DII, DIII and aVF on his electrocardiography.

Cardiac catheterization demonstrated severe CAD. Both the left anterior descending (LAD) and the right coronary arteries (RCA) were totally occluded, and the first diagonal branch was also severely involved. Because of the possibility of using it as a graft, the LIMA was also visualized during the angiography. Its diameter was normal without any calcification or plaque obliterating the vessel lumen. An echocardiographic examination was unremarkable except for inferior wall akinesia with an ejection fraction (EF) of 51%.

Before the operation, a dermatologist and an ophthalmologist evaluated the patient and found only two skin lesions at the medial corner of the upper palpebra bilaterally. In addition, a funduscopic examination was normal except for atrophic scar images in the macula of

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both eyes. After examining these results, the patient was scheduled for CABG.

Following a median sternotomy, the LIMA and saphenous vein were harvested. The LIMA was examined for plaque and calcification, and the flow was measured. No plaque was observed, and the LIMA flow was 154 ml/minute, which was accepted as sufficient. The distal part of the LIMA was taken for histopathologic examination before the LAD anastomosis, and degeneration of the elastic lamina of the arterial wall and dissection of the media layer were observed (Figure 1). The patient had CABG with cardiopulmonary bypass (CPB) and hypothermic cardioplegic arrest. At first, the saphenous vein grafts were anastomosed to the posterior descending artery and the first diagonal branch. Then the LIMA-LAD anastomosis was performed. Following proximal anastomosis, the patient was weaned off of the CPB. At the end of the operation, a skin biopsy was also obtained.

The postoperative period was uneventful, and repeated electrocardiograms (ECGs) did not show any change. A pathological examination of the skin showed elastic fiber fragmentation and dystrophic calcium depositions (Figure 2).

The patient was discharged at the end of the first postoperative week, and his postoperative first year was also uneventful. At the end of the first year the patient underwent coronary angiography because of non-specific chest pain, and this revealed that all the grafts were patent, and the flow and the diameter of the LIMA was evaluated as normal.

DISCUSSION

Pseudoxanthoma elasticum is a rare connective tissue disorder characterized by degeneration and calcification of the elastic fibers of the skin, retina, and blood vessels.[1,2] In the cardiovascular system, the internal elastic lamina of the medium-sized arteries are mainly affected, which usually leads to peripheral vascular disease or CAD prematurely.[1] Renovascular hypertension is also common in these patients.[2]

The main controversy in PXE patients with CAD is the choice of grafts for CABG. The involvement of the IMAs allows for surgeons to avoid using these arteries during CABG. However, other reports have concluded that the LIMA could be considered as a useful graft, whereas others strongly recommend preoperative angiographic and operative macroscopic evaluation of the LIMA.[3-5]

In our case, the LIMA was used as a graft in addition to two saphenous veins. The main reasons that led us to use the LIMA were the normal view of the vessel angiographically and macroscopically during the operation and the adequate flow which was measured during the operation. Although the histopathologic examination of the LIMA showed chronic dissection within the media layer, the early and late postoperative course was uneventful, and the LIMA and saphenous veins were patent angiographically at one year postoperatively.

In conclusion, the IMA is still the most significant and valuable graft used in CABG. In patients with PXE, the IMA may be as involved as the other medium-sized arteries, but this should not preclude its use in CABG. After adequate evaluation of the LIMA during coronary angiography and surgery, if it is not stenozed, it may be used as a conduit for coronary revascularization. However, it should be kept in mind that the long-term patency of arterial grafts still remains unknown in these patients.

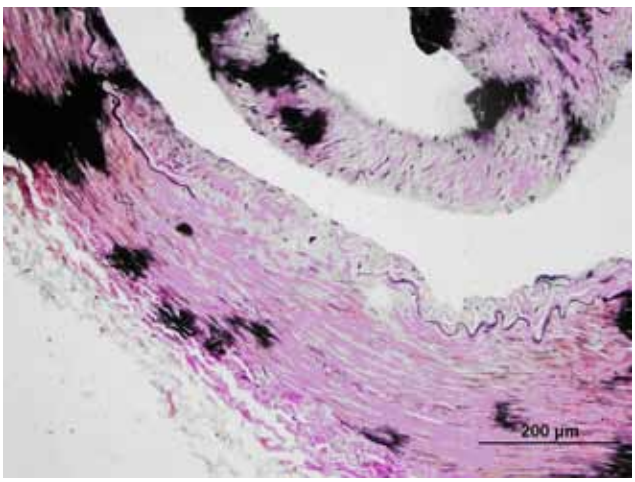

Figure 1. A cross-section of the internal mammary artery shows degeneration of the elastic lamina of the arterial wall (H-E x 400).

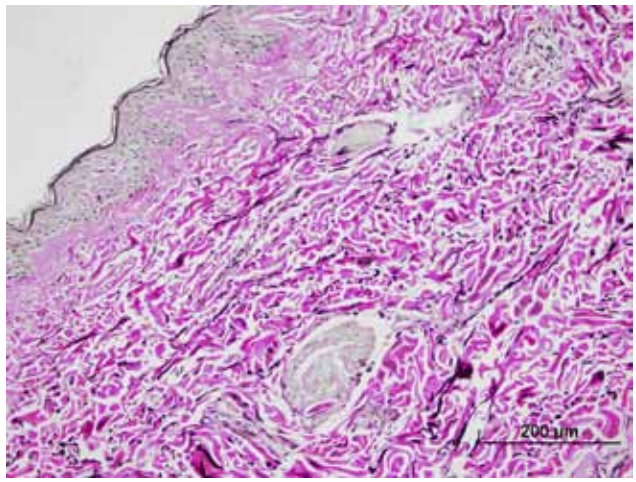

Figure 2. A cross-section of the skin shows elastic fiber fragmentation and dystrophic calcium deposition (H-E x 400).

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