EŞ ZAMANLI YAPILAN KAROTİS ENDARTEREKTOMİ VE KORONER ARTER BY-PASS GREFT AMELİYATINDA ALTERNATİF BİR KAROTİS YAMA OLARAK OTOLOG PERİKARD KULLANIMI

Usage of Autologous Pericardıum as an Alternative Carotid Patch in Concomitant Carotid Endarterectomy and Coronary Artery By-Pass Graft Surgery

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ÖZET

Karotis arter darlığı, iskemik inmenin başlıca nedenlerinden biridir. Karotis endarterektomi (CEA), karotis arter darlığı için başlıca iki tedavi seçeneğinden biridir. Ameliyatın son aşamasında, primer sütür ile ve ya sentetik (PTFE ve Dacron) veya otolog (safen ve boyun damarları) greftleri ile arteriyotomi kapatılması yapılabilir. Bu olgu sunumunda, greft yokluğu durumunda eşzamanlı yapılan CEA ve koroner arter by-pass greftleme cerrahisi esnasında karotis arteriotomi kapatılması için otolog perikardiumun patch-greft olarak kullanıldığı dört ayrı olguyu sunmayı amaçladık.

Anahtar Sözcükler: *Endarterktomy; Perikardium; Otolog; Graft; Patch*

ABSTRACT

Carotid artery stenosis is one of the main causes for ischemic stroke. Carotid endarterectomy (CEA) is one of the two major treatment options for carotid artery stenosis. Arteriotomy closure at the last phase could be performed with primary suturing and also either with synthetic (PTFE and Dacron) or autologous (saphenous and neck veins) grafts. In this case-report; we aimed to present four seperate cases in which we used autologous pericardium as a patch-graft for carotid arteriotomy closure in concomitant CEA and coronary artery by-pass graft surgery (CABG) in consequence of graft absence.

Keywords: *Carotid, Endarterectomy; Pericardium; Autologous; Graft; Patch*

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INTRODUCTION

It's known that the frequency of concomitant carotid and coronary artery disease is frequently high. (1) It has been reported that in the cases of coronary artery by-pass grafting, haemodynamically significant (over 70%) carotid artery stenosis rates ranges from 2,8% to 11,8%. (2-3) Despite of improvements in percutanoues intervention technologies, due to re-stenosis risk; surgical intervention is still accepted superior to the percuttaneous approach.. At the end of CEA surgery, arteriotomy closure may be performed with primary suturing, or either autologous (saphenous, neck veins, etc.) or synthetic (PTFE, Dacron, etc.) patches. Effects of these materials on re-stenosis have been revealed in many studies. (4-8) There is not sufficient data in the literature concerning about usage of autologous pericardium as a patch in carotid endarterectomy. In our four concomitant carotid endarterectomy and coronary artery by-pass graft surgery cases due to lack of synthetic patch and insufficiency of saphenous/ venous graft-patch, autologous pericardium was used. Pericardium was hardened via glutaraldehyde solution before initiating the endarterectomy procedure.

Surgical Technique:

Under general anaesthesia, after standart median sternotomy patch for carotid endarterectomy closure was prepared from pericardium. Pericardial patch temporarily has been hold in glutaraldehyde solution for a minute. After performing the incision from the anterior part of Sterno-Cleido-Mastoideus muscle a carotid-shunt was placed for blood-supply and the routine carotid endarterectomy procedure was performed. At the end, arteriotomy closure was made with prepared pericardial patch via continuous-suturing technique. Coronary artery by-pass grafting was started following the bleeding control in carotid endarterectomy surgical field.

Case #1:

68-years old female patient referred to our emegency department with the complaint of chest pain in June-2016. She had been under medication for diabetes mellitus and hypertension. Pre-diagnosis was Non-STEMI and the following coronary angiograph reveals three-vessel coronary artery disease. Then patient was referred to our cardio-vascular surgery department for coronary artery by-pass grafting surgery. During pre-operative routine bilateral coloured carotid-vertebral artery doppler usg detected bilateral internal carotid artery calcified-stenosis. The lesions were bilaterally in the bulbar segments of the common carotid artery.. The percentage of the stenosis were above 80% according to doppler recordings. For further investigation, Carotid-Vertebral Artery CT-Anjiogram was performed. CT-Anjiogram reports correspondingly bilateral internal-carotid artery stenosis in the bulbar segments. The percentage of the lesions were 80% in the right side and 60-70% in the left side. EuroScore-II score of this patient was calculated as 3,29%. Pre-operative preparation of the patient to concomitant Carotid-Coronary surgery was completed. As operational data, total length of the operation (Left CEA and 3-Vessel CABG) was 5-hours 40-minutes. During the surgery no decrease was observed in BiSpectral-Index monitoring. Patient was extubated in the ICU in the post-operative 13th hour without any neurological complication. No bleeding and no local complication was observed in CEA field. Patient was discharged in the post-operative 7th day with Glascow-Coma-Score of 15. In her fourth month of follow-up right side carotid endartercetomy was performed with sytnthetic patch closure. The patient is under follow-up without any neurological complication for 10-months. In her 6th month of the follow-up bilateral coloured doppler usg was performed for control, no decrease in the flow or stenosis has been observed bilaterally.

Case#2:

64-years old diabetic female patient was consulted to our cardio-vascular surgery department with a dignosis of three-vessel coronary artery disease (Left Main Coronary Artery lesion). During pre-operative routine bilateral coloured carotid-vertebral artery doppler usg detected right internal carotid artery calcified stenosis. The lesion was in bulbar segment and the length of the lesion was 1,5-cm. The percentage of the stenosis was above 70% according to doppler recordings. further investigation, Carotid-Vertebral Artery CT-Anjiogram was performed. CT-Anjiogram reports correspondingly rightl internal-carotid artery stenosis in the bulbar segment. The percentage of the lesion was above 90%

according to CT measurements. EuroScore-II score of this patient was calculated as 2,54%. Pre-operative preparation of the patient to concomitant Carotid-Coronary surgery was completed. As operational data, , total length of the operation (Left CEA and 3-Vessel CABG) was 5-hours 50-minutes. During the surgery no decrease was observed in BiSpectral-Index monitoring. Patient was extubated in the ICU in the post-operative 17th hour without any neurological complication. No bleeding and no local complication was observed in CEA field. Patient was discharged in the post-operative 7th day with Glascow-Coma-Score of 15. The patient is under follow-up without any neurological complication for 9-months. In her 7th month of the follow-up bilateral coloured doppler usg was performed for control, no decrease in the flow or stenosis has been observed bilaterally.

Case #3:
84-years old male patient referred to our cardiology out-patient clinic with the complaints of chest pain and vertigo (dizziness) in March-2017. He had been under medication for diabetes mellitus and hypertension. Under elective planned conditions, coronary and carotid angiograph reveals three-vessel coronary artery disease and right internal carotid lesion. Then patient was referred to our cardio-vascular surgery department for coronary artery by-pass grafting and CEA surgery. The percentage of the stenosis was above 70% according to angiograph. EuroScore-II score of this patient was calculated as 3,57%. Pre-operative preparation of the patient to concomitant Carotid-Coronary surgery was completed, and an informed-consent was signed by patient and her relatives. As operational data, total length of the operation (Left CEA and 3-Vessel CABG) was 5-hours 40-minutes. During the surgery no decrease was observed in BiSpectral-Index monitoring. Patient was extubated in the ICU in the post-operative 13th hour without any neurological complication. No bleeding and no local complication was observed in carotid endarterectomy field. Patient was discharged in the post-operative 8th day with Glascow-Coma-Score of 15. In his fourth month of follow-up, right side-coloured doppler usg was performed for control, no decrease in the flow or stenosis has been observed. The patient is stil under follow-up without any neurological complication.

Case #4:
72-years old male patient referred to our cardiology out-patient clinic with the complaint of chest pain in July-2017. He had been under medication for hypertension. Under elective planned conditions, coronary and carotid angiograph reveals three-vessel coronary artery disease and right proximal internal carotid lesion. Then patient was referred to our cardio-vascular surgery department for coronary artery by-pass grafting and CEA surgery. The percentage of the stenosis was above 75% according to CT-angiograph. EuroScore-II score of this patient was calculated as 4,52%. Pre-operative preparation of the patient to concomitant Carotid-Coronary surgery was completed. As operational data, total length of the operation (Left CEA and 3-Vessel CABG) was 6-hours. During the surgery no decrease was observed in BiSpectral-Index monitoring. Patient was extubated in the ICU in the post-operative 9th hour without any neurological complication. No bleeding and no local complication was observed in CEA field. Patient was discharged in the post-operative 10th day with Glascow-Coma-Score of 15. The patient is stil under follow-up without any neurological complication.

DISCUSSION

Carotid artery stenosis is a major vascular disease with complications and may result with stroke and death. In these patients CEA is a safe and effective treatment modality as DeBakey described (9)

In the 40-50% of patients who are scheduled for CEA; existence of a Coronary Artery Disease stated and concomitant surgical approach to both diseases suggested in the literature. (10) In our department, current approach is up-to-date to this direction and we use carotid-shunt routinely in clinical practice despite selected cases which are not suitable due to diameter of internal carotid artery.

CEA is still a gold standart treatment for Carotid artery stenosis. On the other hand, percutaneous stenting interventions and endovascular approaches for carotid artery disease are increasing in number for the patients who are in risky population for surgery.

Arteriotomy closure with patch after CEA decreases the risk of late post-operative period stroke and re-stenosis. (11) Autologous grafts may be chosen because that they are less trombogenic and more resistant to infections. But prolongation of the surgery time, wound infections related to prepared graft and late aneurismal dilatation are undesirable conditions. (12)

There are different concepts for usage of autologous gratfs and synthetic grafts. Archie et al. compare sapheneous vein patch and Dacron patch, at the end restenosis ratio was found to be higher in Dacron patch group (13). Grego et al. reported that they have seen less neurological events and less re-stenosis in the patients to whom they have used external jugular veins rather than PTFE graft. But the results were not statistically significant. (14). Bond ete al. reported no statistically difference between patch materials in a meta-analysis with 1480 patients. (8) Also Ren et al. didn't find any suggestive difference between patch materials in their meta-analysis. (5)

In all studies bleeding, ischemic events and re-stenosis were reviewed. Studies for bleeding risk due to patch selection are not satisfactory.

Vakhitov revealed pseudo-aneurismal dilatation of plasty area (autovenous - sapheneous vein graft) in the first post-operative 12-months period. (14) We did not observe any aneurismal dilatation in our Case #1.

We used autologous pericardium because of synthetic patch absence and inadequate sapheneous vein grafts because of poor quality for our two patients of concomitant CEA-CABG surgery. During follow-up we've seen no neurological complications and in control grafts are open. In patients who are scheduled for concomitant CEA and CABG surgery, we believe that as an autologous graft pericaridum may be used as a carotid patch in the patients who have inadequate autologous grafts and absence of synthetic patches. Although the number of the cases is limited, with increasing number of the patients in the future will enlighten our knowlegde and results.

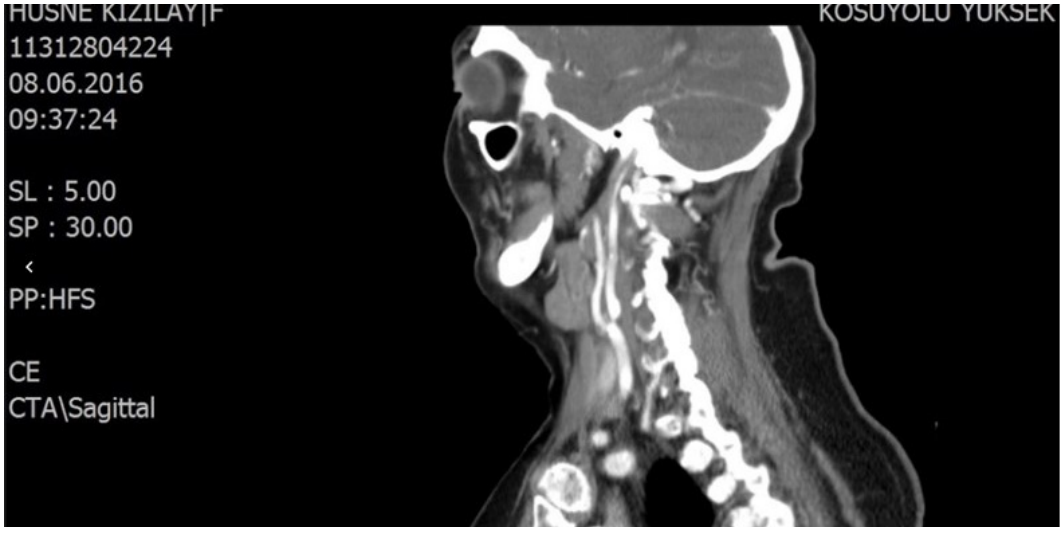

Image.1: Case #1. Pre-operative CT-Angiograph image.

Image.2: Case #1. Post-operative 3th month control angiograph image.

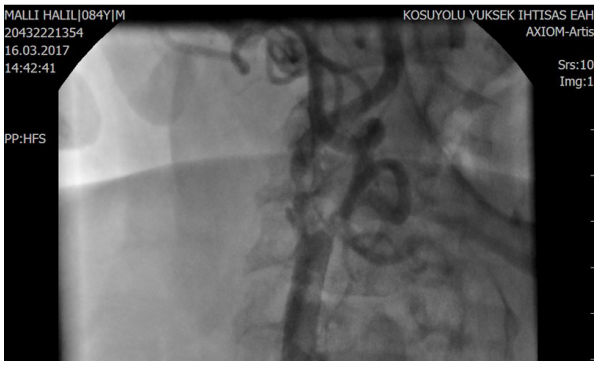

Image.3: Case #3. Pre-operative angiograph image.

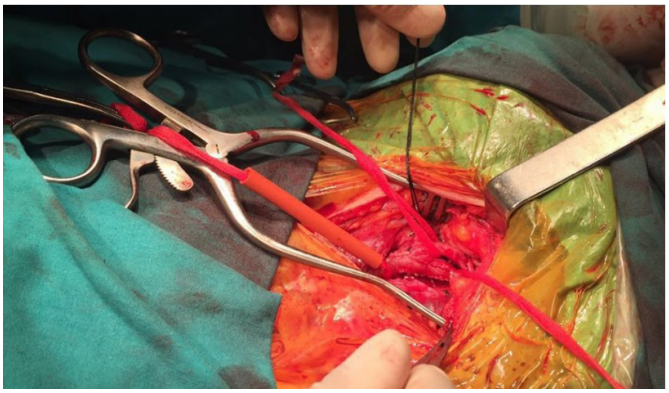

Image.4: Case#1. Intraoperative image of the surgical field (After arteriotomy closure)

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