

A Well-known But Generally Overlooked Collateral Channel In Aortoiliac Occlusive Disease - Winslow's Pathway

Aortailiyak Tıkayıcı Hastalıkta İyi Bilinen Ancak Genellikle Gözardı Edilen Bir Kollateral Kanal - Winslow Yoluğu

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ABSTRACT

The aortoiliac occlusive disease triggers critical limb ischemia; however, the blood supply of lower extremities can be sustained through possible collateral channels. Due to the development of collateral circulation, a substantial number of patients with aortoiliac occlusion remain clinically silent and asymptomatic. Internal mammarian artery originates from the same embryogenic dorsal aorta with inferior epigastric artery and serves as a possible collateral supply in aortoiliac occlusive disease. The connection between the internal mammarian artery and the inferior epigastric artery is known as Winslow's pathway. Harvesting of internal mammarian artery in coronary artery bypass grafting surgery can result in critical limb ischemia in aortoiliac occlusive disease with patent Winslow's pathway.

Key words: Aortoiliac occlusive disease, internal mammarian artery, Winslow's pathway

ÖZET

Aortailiyak tıkaıcı hastalık kritik bacak iskemisine yol açmaktadır. Öte yandan alt ekstremitelerin dolaşımı olası kollateral kanallar ile devam ettirilebilir. Kollateral dolaşım gelişimine bağlı olarak aortailiyak tıkaıcı hastalığı olanların önemli bir kısmı asemptomatiktir ve klinik açıdan sessiz seyretmektedir. İnternal mammarian arter inferiyor epigastrik arter ile aynı embriyojenik dorsal aortadan köken almaktadır ve aortailiyak tıkaıcı hastalıkta önemli bir kollateral kaynağı olarak görev alır. İnternal mammarian arter ve inferiyor epigastrik arter arasındaki bağlantı Winslow yoluğu olarak isimlendirilir. Winslow yoluğu patent olan bir aortailiyak tıkaıcı hastalığı bulunan bir hastada koroner arter bypass greftleme cerrahisinde internal mammarian arterin kullanılması kritik bacak iskemisini tetikleyebilir.

Anahtar Kelimeler: Aortailiyak tıkaıcı hastalık, İnternal mamarian arter, Winslow yoluğu

INTRODUCTION

Collateral development is commonly seen for the solidity of blood supply of lower extremities in the atherosclerotic diseases of abdominal aorta and iliac arteries. Internal mammarian arteries (IMA) can serve as a well-known collateral source for aortoiliac occlusive disease patients and is named Winslow's pathway (1). Despite that, this common collateral channel is generally overlooked in clinical practice. The prevalence of the aortoiliac occlusive disease is likely to be higher than known, due to silent course and asymptomatic nature of some patients. Clinical

symptoms may vary from mild thigh claudication to Leriche syndrome (diagnosed as impotence, bilateral hip pain, reduced femoral pulses and aortic occlusion) (2).

Harvesting of IMA during coronary artery bypass grafting (CABG) surgery may trigger critical limb ischemia in patients with aortoiliac occlusive disease. Attention should be paid for the possible presence of Winslow's pathway in patients who are being prepared for CABG surgery. Herein this report, we aimed to present a coronary artery disease patient who was scheduled for CABG surgery and detected aortic

occlusion with a collateral source of left lower extremity from left IMA.

CASE REPORT

A 64-year-old male patient was admitted to cardiovascular surgery outpatient clinic with complaints of intermittent claudication and shortness of breath with exercise. Duplex sonography of lower extremities revealed monophasic flow pattern in bilateral femoral arteries and coronary artery and peripheral artery angiographies were decided to be performed at the same session. We detected severe stenosis in left circumflex (Cx) coronary artery and percutaneous

coronary intervention (PCI) was planned (Figure 1A-1B). We also detected a total occlusion of abdominal aorta at the infrarenal level. A well-developed collateral pathway from left internal mammarian artery (IMA) was found to be the main blood supply of lower extremity arterial circulation via a collateral channel with inferior epigastric artery (Figure 1C-1D). Due to the high risk for the development of contrast nephropathy we could not be able to search for the collateral source of right lower extremity. Bilateral aortoiliac bypass grafting was also recommended to the patient for peripheral artery disease.

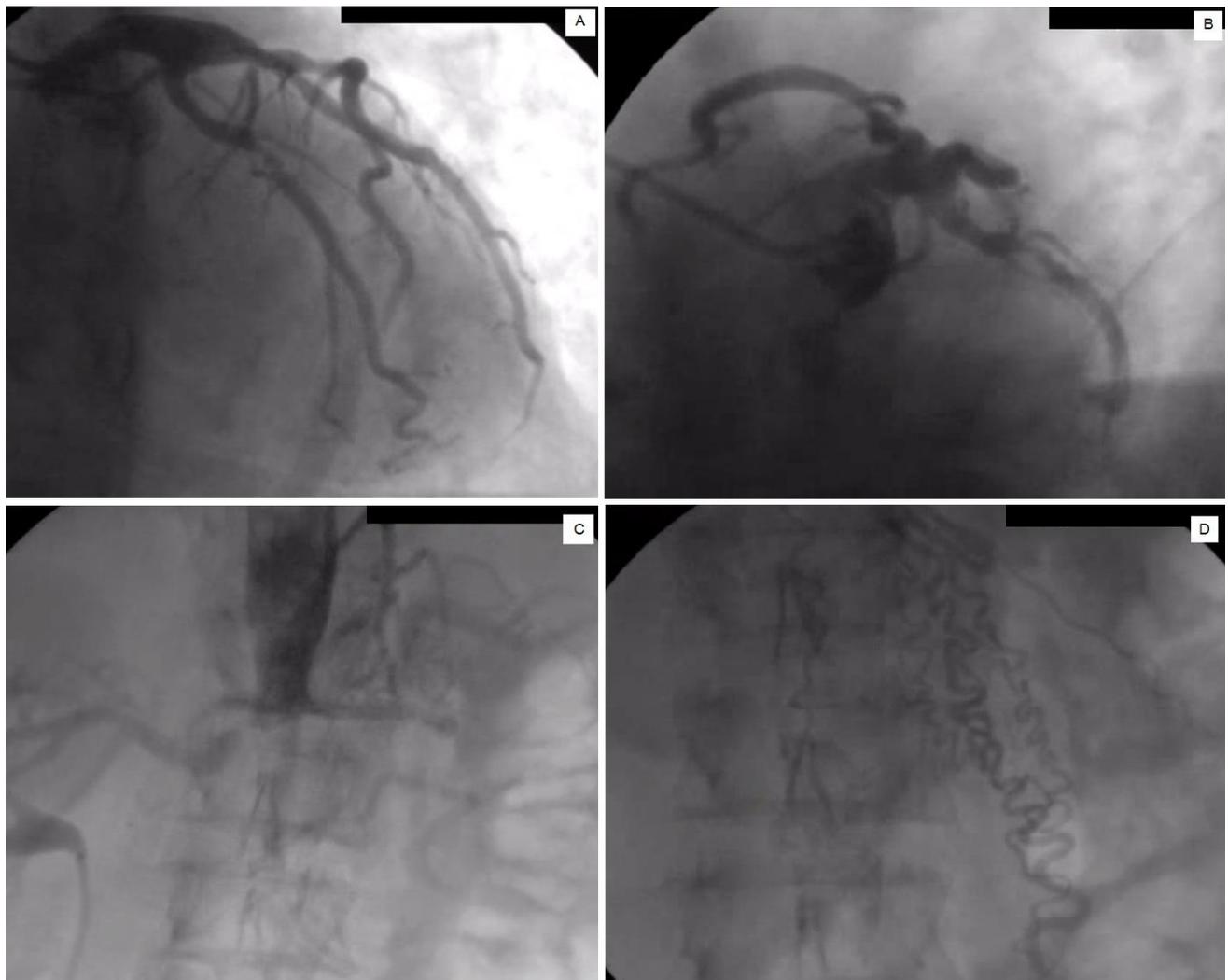


Figure 1. A) Circumflex coronary artery with a significant stenosis in anteroposterior caudal view. B) Circumflex artery with a significant stenosis in left caudal view. C) Abdominal aorta is totally occluded just below the renal arteries. In this anteroposterior view, a significant stenosis of right renal artery was also detected. Weak collateral vessels to lower extremity can be seen beyond the total occlusion level of abdominal aorta. D) Left internal mammarian artery depicts a strong collateral vessel development with inferior epigastric artery.

DISCUSSION

Aortoiliac occlusive disease can have 2 different collateral sources as systemic-systemic and systemic-visceral pathways. Embryological development of abdominal aorta and lower extremities permits the development of a common collateral pathway (2). Primitive, rudimentary aorta divides into 3 parts as ventral, lateral and dorsal aorta. Systemic-systemic collateral pathways are related to the members of embryogenic dorsal aorta. IMA and inferior epigastric artery originate from embryogenic dorsal aorta and a systemic-systemic collateral pathway, named Winslow's pathway, may develop in need between them (2). Winslow's pathway is a potential embryological connection between internal thoracic artery and inferior epigastric artery and is a well-defined collateral source to maintain lower extremity arterial circulation in aortoiliac occlusive disease. Though, this vital collateral development is generally being neglected in clinical practice (3,4).

Winslow's pathway should be kept in mind in patients with aortoiliac occlusive disease who will undergo CABG. Harvesting of IMA for CABG in a patient with an active Winslow's pathway may cause critical lower limb ischemia. If there is long-standing intermittent claudication in a patient who scheduled for CABG, searching for Winslow's pathway with selective IMA angiography is necessary (5). Selective angiography is recommended instead of aortography to minimize the amount of contrast agent used. If a patent Winslow's pathway is detected, contribution of Winslow's pathway to lower extremity blood supply via Doppler ultrasonography evaluations should be evaluated. If

Winslow's pathway is diagnosed as the main blood supply for lower extremities than harvesting of IMA for CABG surgery is contraindicated because the possibility of critical limb ischemia. Saphenous graft anastomosis can be preferred in scheduled CABG patients with a hemodynamically active, patent Winslow's pathway (5). Attention also should be paid to transverse abdominal incisions in these patients because of the superficial course of the internal thoracic arteries.

Informed Consent: Informed consent was taken from the patient.

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