The usefulness of ankle-brachial index as a screening test on peripheral artery occlusive disease in patients with low back and leg pain

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There are several causes for low back and leg pain. Peripheral artery occlusive disease (PAOD) is also one cause of leg pain and is a disease that causes occlusion in the lower limb artery. PAOD can require even amputation if diagnosis is delayed, so proactive diagnosis and treatment is needed. Many ways of diagnosis have been developed by several researchers. One of these methods is the ankle-brachial index (ABI), a noninvasive, very simple and useful method that is widely used through blood pressure measurement of the lower and upper extremities [1,2]. The authors diagnosed a patient who visited the outpatient office of the pain clinic in our hospital due to low back and leg pain as peripheral vascular disease using the ABI. The patient was a 78-years old male with low back pain and both leg pain for seven years. The patient was 170 cm, 63 kg, with no sign of obesity, had been taking 2 mg of warfarin once daily because of hypertension and arterial fibrillation. He was diagnosed with coronary artery occlusive disease (CAOD) 3 vessel disease 2 years ago and had received a stent insertion for two times. The patient was a farmer with a history of falling from a cultivator twice several years ago, and since those incidences, had continuous pain in his lower back and bilateral legs. He had received a selective transforaminal epidural block at a private clinic 3 years ago but it was not effective. The patient had complained of severe pain rated as 70/100 mm by the visual analogue scale for pain at the time of visit to the pain clinic and also informed that when rested, he had less pain, but after walking about 50 to 100 m,

the leg would swell and be painful. He did not show any other specific signs or symptoms other than direct tenderness of L4 and L5 from the physical examination, and motor nerve as well as sensory nerve was intact. He had never had a spine MRI, but from a simple radiograph taken a year ago, the finding of L1 and L2 compression fracture as well as L4/5, L5/S1 spinal stenosis had been observed. He was under concomitant medication of torasemide 5 mg, warfarin 2 mg, telmisartan 40 mg and clopidogrel 100 mg currently. After considering the symptoms reported and observed and the findings from physical examination as well as x-ray, the patient was suspected as having the spinal nerve compression-induced radiculopathy. Therefore, we considered performing a diagnostic nerve block but since the patient was taking warfarin and clopidogrel we been decided to perform the nerve block after discontinuing the medication. And taking into account that he was older, had hypertension and CAOD, and had been smoked one pack of cigarette daily for 50 years, we could not rule out vascular origin pain, so we decided to implement the comparatively simple and noninvasive ABI. First, we measured the blood pressure (BP) of the patient's brachial artery as well as posterior tibial artery by cuffing a non-invasive sphygmomanometer on both upper arm and ankle. The BP of upper limbs was measured as 118/64 mmHg on the right side, and 123/60 mmHg on the left side, whereas the BP of lower limbs was measured very low as 57/49 mmHg on the right side for the first time and as 84/59 mmHg at the second time. From

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Fig. 1. CT-lower extremity angiography (contrast) showing Right external iliac artery 80% luminal stenosis (arrow).

the left side lower limb, his BP was measured as 120/52 mmHg. When we calculated the ABI of the right side leg, the first result was 0.48, and the second was 0.71. Therefore, immediate interdisciplinary medical care to the Cardiology Department was requested since the patient was suspected to have PAOD. A CT-lower extremity angiography with contrast was implemented in the patient. Narrowing of vascular inner diameter over the image of CT angiography was observed over right anterior tibial artery and external iliac artery (Fig. 1). Patient was then admitted to the hospital via the Cardiology Department and underwent a

percutaneous angioplasty.

PAOD is very common disease with a provenance of up to 12 to 14% in the general population and its prevalence is age-dependent, showing 10%, in those ≥ 60 years old [3], and 20% for those ≥ 75 years old [4]. The most common cause is atherosclerosis in which the blood flow to tissues is reduced by single or multiple stenosis, resulting in expression of pain and cramp in leg with intermittent claudication as main symptom, which becomes more severe during exercise and improves during resting time. However, most patients are asymptomatic and undiagnostic, so only 12–18% demonstrate typical symptoms [1]. There has been a report that 40% of patients with CAOD and cerebrovascular disease had concurrent PAOD in connection to atherosclerotic syndrome as the risk factor, and out of those with PAOD, 60% had CAOD and cerebrovascular disease concurrently [5]. There are other risk factors such as smoking, old age, diabetes, obesity, hypertension as well as family history of hypertension, hypercholesterolemia. In this patient's case, he had many risk factors including being a current smoker, old age, hypertension, arterial fibrillation and CAOD 3-vessel, thereby, not only the lumbar radiculopathy but also the PAOD-induced vascular pain were suspected as the causes of pain. Similar to the patient in aforementioned case report, if a patient has a spine lesion concurrently being identified from images of MRI or X-ray, cardiovascular risk factors including old age, current smoking, cardiovascular disease, diabetes and hypertension, and for those suspected with PAOD, a differential diagnosis should be made by checking ABI, while always keeping the possibility of pain from PAOD-induced pain in mind.

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