Extrinsic compression of left iliac vein does not predict the development of post thrombotic syndrome in left side deep venous thrombosis

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**Purpose:** Left side deep venous thrombosis (DVT) is associated with May-Thurner’s anatomical variation and is often instigated by invasive treatment. The aim of this study is to analyze the influence of left iliac vein narrowness on incidence of post thrombotic syndrome (PTS) that developed after left side DVT. **Methods:** Forty-one left side DVT cases that were followed up for more than 1 year were enrolled. The iliac vein narrowness was measured by the shortest distance from the right iliac artery to the 5th lumbar vertebra overlying left iliac vein in computed tomography (CT) scan. The incidence of PTS was measured by phone-call history taking for specific symptoms of PTS. The means of the shortest distance were compared by independent t-test. **Results:** The number of PTS cases was eleven (26.8%). The level of thrombus, demographic data and other risk factors were similar in both PTS and non-PTS groups except the mean risk factor score. The mean of the shortest distance of PTS group and non-PTS group were 5.56 mm and 5.89 mm, respectively. **Conclusion:** The degree of left iliac vein narrowness measured by the shortest distance from the right iliac artery and the 5th lumbar vertebral body was not a predictive factor for PTS.

**Key Words:** Venous thrombosis, X-ray computed tomography, Postthrombotic syndrome

**INTRODUCTION**

There are two main goals in treatment of deep venous thrombosis (DVT) of lower extremities: One is to reduce the chance of fatal pulmonary embolism and the other is to prevent post-thrombotic syndrome (PTS) [1]. We try to find out a high risk patient of DVT and to prevent the development of DVT in a sense that it is not easy to achieve the former once the DVT is established. Prevention of PTS can be a main focus of managing lower extremity DVT. Several studies have shown that the frequency of PTS to be up to 30 to 40% and PTS was associated with worsened quality of life [2,3]. Recent studies report the efficacy of early invasive treatment for acute DVT in order to achieve a high venous patency rate and to preserve valve function [4,5]. However, some researchers argue that an invasive treatment such as thrombolytic therapy couldn’t prevent the long-term outcomes, PTS [6]. And proximal DVT of the
left side is closely related to iliac vein compression syndrome or May-Thurner syndrome [7]. We report that the minor diameter of the left iliac vein between the right iliac artery and the 5th vertebral body impacted the incidence of left side proximal DVT [8].

This study aims to investigate a new non-invasive method to predict PTS after acute DVT. We focused the left iliac vein narrowness measured by the shortest distance from right iliac artery to the 5th vertebral body overlying left iliac vein in computed tomography (CT) scan.

METHODS

One hundred and sixty-six limbs in 113 patients with DVT diagnosed by duplex scan with serum d-dimer test in one institute were reviewed. CT scan was performed to detect presence of pulmonary embolism as well as to determine the exact location of the thrombus in the vein (Fig. 1). We used a uniform protocol for CT pulmonary arteriography and indirect venography [9]. We excluded twenty cases that received thrombolysis or other invasive treatments. Among the 146 cases, CTs for the diagnosis of pulmonary embolism were checked in 131 cases. We contacted 65 cases of the left side DVT over a year after the first diagnosis and ended up with forty one cases for analysis. All the cases were recommended one year of oral anticoagulation and anti-gravity stockings. Anticoagulation was performed by treatment with oral warfarin maintaining the prothrombin time between 2 to 2.5 international normalized ratio. CT scan and duplex scan were performed at a year follow-up of oral anticoagulation. We evaluated the recanalization of thrombosed vein by CT scan and duplex scan at a year follow-up. According to our definitions, recanalization was the partial or complete resolved thrombus while non-recanalization was complete occlusion of a whole venous lumen in any segment of thrombosed vein.

The shortest distance from right iliac artery to 5th vertebral body was measured in picture archiving and communicating system program using π-ViewSTAR (INFINITT Healthcare Co., Seoul, Korea). The distance was measured at the shortest distance between the right iliac artery and the 5th vertebral body overlying left iliac vein on cross-sectional view (Fig. 2).

Diagnosis of PTS was checked by phone call with questionnaire. We used the Ginsberg measure of PTS diagnosis [10]. We asked the following questions: 1) Do you have newly onset chronic venous insufficiency signs, such as varicose veins, swelling of foot or calf, skin pigmentation or discoloration, and venous ulcers? 2) Is there any

![Fig. 1. Indirect computed tomogram (CT) venography. White arrows indicate the thrombus in the left iliac and femoral vein.](image1)

![Fig. 2. Distances are measured in cross-sectional views. The shortest distance is measured from right iliac artery to 5th vertebral body overlying left iliac vein by picture archive communication system software. RIA, right iliac artery; IVC, inferior vena cava; LV, lumbar vertebra.](image2)