



# An Uncommon Presentation of Varicose Vein: A Case Report

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## Abstract

**Introduction:** Pulsating varicose vein is a very rare clinical manifestation and mostly has been reported with tricuspid regurgitation or right ventricular dysfunction. The exact etiology and treatment options for this disease are rarely reported in the literature.

**Case Presentation:** This article presents the case of a 45-year-old woman with varicose veins in both her lower limbs when she came to our department. Venous ultrasound showed arterial-like pulsations in both superficial and deep veins of the lower extremities, and echocardiography showed severe tricuspid regurgitation. We administered compression therapy with elastic stockings, and the symptoms of the patient were significantly relieved. In addition, in this article, we reviewed other cases reported in the current literature and discussed appropriate treatment options for this disease.

**Conclusion:** Pulsating varicose veins are very rare clinical manifestations and mostly have been reported with tricuspid regurgitation or right ventricular dysfunction. For the treatment of this disease, multidisciplinary teams in cardiology, vascular surgery, and anesthesia are the best choices.

**Keywords:** Pulsatile, Tricuspid regurgitate, Varicose

## 1. Introduction

Primary saphenous varicose veins are a common disease of vascular surgery. Secondary varicose veins of the lower extremities are mainly common in stenosis or obstruction of reflux veins, deep vein thrombosis in the following limbs, Cockett syndrome, and Budd-Chiari syndrome (1, 2). Changes in venous pressure due to occlusion of the femoral vein, concealed venous valve, and penetration of venous insufficiency play important roles in the progression of chronic venous insufficiency (3). The pulsating varicose veins caused by venous reflux from the heart are rarely reported in the literature and are not recognized by most doctors. In this study, the patient came to our department because of varicose veins in both lower limbs; however, she was eventually diagnosed with severe tricuspid regurgitation.

## 2. Case Presentation

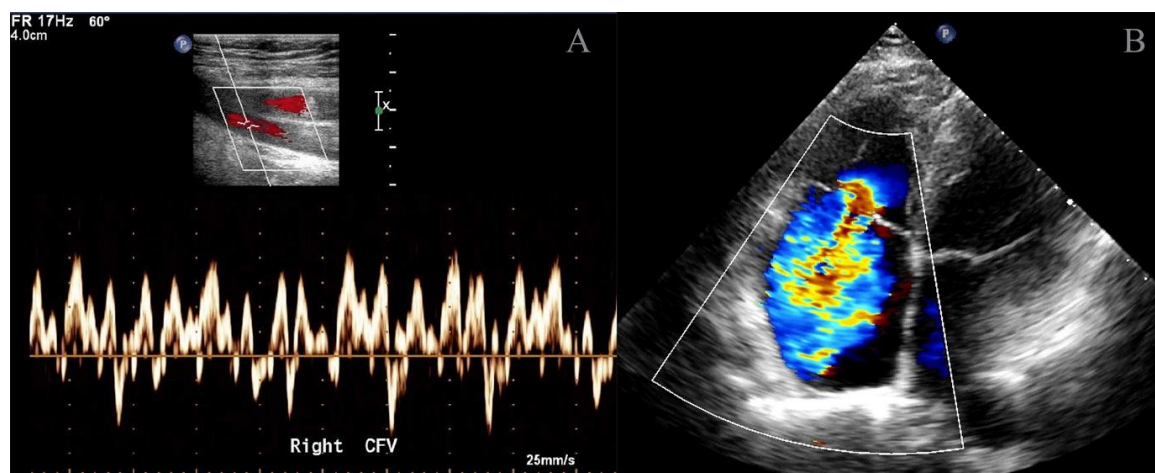
A 45-year-old female patient with a body mass index of 21.2 presented to our department with bilateral varicose veins and progressively worsened lower extremity edema (Figure 1). Her medical history showed that she had superficial varices in her legs in her 20s which became more severe after pregnancy. Physical examination confirmed bilateral saphenous vein varicose veins, superficial varicose veins of the lower extremities, superficial vein dilatation of the abdominal wall, and moderate edema of the ankle.

It was suspected that the patient had a disease related to the inferior vena cava or heart. Therefore, the patient was scheduled for lower extremity venous ultrasound and inferior vena cava ultrasound which showed bilateral saphenofemoral valvular insufficiency, saphenous vein, and deep vein of the lower extremity with arterial pulsatile blood flow signal (Figure 2A).

In addition, her heart was examined and severe tricuspid regurgitation through auscultation and echocardiography was detected (Figure 2B). The examination showed that the systolic blood pressure of the pulmonary artery was 43 mmHg and the diameter of the inferior vena cava was 19 mm. We believed that



**Figure 1.** Picture of the external appearance of the varicose veins and the affected area of the patient



**Figure 2.** A. Ultrasound reveals reversed arterial-like pulsating flow in the femoral vein. 2B. Echocardiography revealed severe tricuspid regurgitation

this phenomenon was caused by an increase in venous pressure. Therefore, we diagnosed secondary varicose veins (C3EsAs, d, pPr) for this patient.

Given the greater risk of cardiac surgery, the patient refused to replace the tricuspid valve. Moreover, since she did not have any symptoms of venous ulcers and gave her consent, we used Covidien T.E.D Grade 2 compression stockings for compression therapy. At the follow-up stage, after 1 year, her symptoms were relieved and we continued the same therapy for her.

### 3. Discussion

Currently, only 5-20% of varicose veins are secondary varicose (1,2). However, pulsating varicose veins caused by tricuspid regurgitation or cardiac insufficiency are relatively uncommon, such as patients summarized in Table 1 (3-9). Tricuspid regurgitation increases atrial pressure and slows the return of venous blood to the heart, increasing venous pressure, which in turn, leads to venous insufficiency and varicose veins.

Patients with severe tricuspid regurgitation, whether early or late, have an important relationship with the progression of varicose veins in the lower extremities. Due to tricuspid regurgitation and contraction of the myocardium, a pulse-like signal defined as a large V-wave was displayed in the vein of the lower extremity. This varicose vein is often mistaken for arteriovenous fistula, but ultrasound does not reveal significant abnormal passages.

According to M. Abbas (8), compressing the vena femoral-femoral junction and feeling the pulse of varicose veins is a practical inspection method to exclude arteriovenous malformations. The lack of pulse indicates that it may be the cause of venous return. However, when the pulsating veins are not palpable, varicose veins in the abdomen suggest

disease in the proximal blood vessels.

Compression of the saphenous-femoral junction and the perception of pulsation is a common diagnostic solution (2-4,6,8). If it is misdiagnosed as primary varicose veins and does not treat heart problems, it will recur after a short period and cause intraoperative major bleeding and postoperative hematoma (4,8). A small number of existing literature recommended the use of conservative treatment for light-moderate patients, i.e., compression therapy. However, for patients with active ulcers or severe symptoms, the use of sclerotherapy or radiofrequency treatment may be better, the premise of which is solving heart problems.

The overall goal of patient care is to maintain intact skin, reduce edema, relieve pain, prevent complications, appropriate care for complications, optimize wound healing potential, and improve patients' self-care ability. Once a patient develops a venous ulcer, all the relevant medical staff should receive specialized training on the evaluation and treatment of venous ulcers of the lower extremities to ensure that the treatment plan can be effectively implemented.

At the same time, a team of specialist physicians and specialist nurses should be established for the treatment and nursing of venous ulcer wounds of lower extremities. The training items should include the following main contents: 1. disease knowledge education, 2. wound assessment, 3. wound care, 4. psychological support, 5. support by caregivers, 6. recurrence prevention, 7. mental stimulation avoidance, 8. Observing, recording, accurate recording, and quality control of the relevant data of the treatment process and how to recommend specialized treatment and nursing. For the treatment of this disease, multidisciplinary teams in cardiology, vascular surgery, and anesthesia are the best choices.

**Table 1.** Patient basic characters and management for these patients

| Case                | Age, gender | Limb presentation   | Ultrasound  | Echo   | Treatment  | Result                                 |
|---------------------|-------------|---|---|--|--|--|
| Case 1 <sup>3</sup> | 82, F       | Right ulcer, varicose, pulsatile GSV  | Triphasic flow to infragenicular GSV, incompetent sapheno-femoral junction                        | Tricuspid regurgitation                                | Compression therapy  | Ulcer healed                           |
| Case 2 <sup>4</sup> | 93, F       | Right ulcer, varicose, pulsatile GSV, edema   | dilated hepatic veins, Pulsatile waveform to the level of inferior vena cava                      | Tricuspid regurgitation, right heart failure           | Compression therapy  | Ulcer healed                           |
| Case 3 <sup>5</sup> | 87, M       | Right ulcer, varicose, pulsatile GSV, edema, left acute cellulitis, right heart failure | Triphasic venous waveform on the ipsilateral side   | Tricuspid regurgitation                                | With compression therapy failure, then GSV ligation                      | Significant reduction in ulcer size    |
| Case 4 <sup>6</sup> | 58, M       | Both ulcer with bleeding, pulsatile GSV, edema, pulsatile deep vein                     | Bilateral incompetent sapheno-femoral junction, pulsatile wave to both superficial and deep veins | Severe tricuspid regurgitation the whole heart failure | Compression therapy  | Significant reduction in ulcer size    |
| Case 5 <sup>7</sup> | 75, F       | Both pulsatile GSV, edema   | Bilateral incompetent sapheno-femoral junction, pulsatile wave to both superficial and deep veins | Severe tricuspid regurgitation                         | Compression therapy  | Edema relieved                         |
| Case 6 <sup>8</sup> | 55, F       | Both pulsatile GSV, edema   | Bilateral incompetent sapheno-femoral junction, pulsatile wave to both superficial and deep veins | Severe tricuspid regurgitation                         | High ligation failure, then tricuspid valve repair, final-y GSV ligation | Edema relieved, varicose veins removed |
| Case 7 <sup>9</sup> | 56, F       | Both pulsatile GSV, edema, both pulsatile deep vein                                     | Bilateral incompetent sapheno-femoral junction, pulsatile wave to both superficial and deep veins | Severe tricuspid regurgitation                         | Compression therapy  | Edema relieved                         |

GSV: great saphenous vein

#### 4. Conclusion

Pulsating varicose veins are very rare clinical manifestations and mostly have been reported with tricuspid regurgitation or right ventricular dysfunction. In this article, we described a 45-year-old woman who had varicose veins in both her lower limbs with arterial-like pulsations in both superficial and deep veins of the lower extremities. We gave the patient compression therapy for elastic stockings, and her symptoms were significantly relieved.

#### Footnotes

**Authors' Contributions:** All the authors listed took part in the article and approved submission. Xinpei Ren wrote the manuscript and collected data. Yukui Ma revised the manuscript. Zhoupeng Wu also contributed to the conception of the study and manuscript revision.

**Conflicts of interest:** There were no interest conflicts and legal liability in our report. The related data and figures have not been previously published and the manuscript is not under consideration elsewhere.

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**Ethical Considerations:** The patient gave consent for the publication of her data in the journal, including images.

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