

# A national survey on management of varicose veins in China

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## ABSTRACT

**Objective:** This study aimed to investigate the current clinical practice and management strategies for varicose veins among Chinese physicians in general and in specific case vignettes.

**Methods:** A questionnaire survey was conducted among 726 Chinese physicians who were attending the vascular surgery academic conferences during August 2016 to May 2017 in China. Physicians were eligible if they were familiar with several currently used treatment techniques for varicose veins.

**Results:** A total of 681 physicians from 527 hospitals in 29 provinces across China completed the questionnaire. Of them, 80.0% were vascular surgeons, 13.1% were general surgeons, and 6.9% were interventional radiologists. More than half (67.0%) of them had >5 years of experience in management of varicose veins. A third of the participants performed routine venography for patients with suspected varicose veins. Moreover, 87.5% believed that the patient's medical insurance would influence their choice of treatment modalities. Only 38.5% of the participants' departments could perform day surgery for varicose veins. The most common average hospitalization time was 4 to 7 days, with an average cost of 4000 to 8000 yuan per leg. In the basic case (Clinical, Etiology, Anatomy, and Pathophysiology classification C<sub>2</sub>S<sub>5</sub>E<sub>p</sub>A<sub>s</sub>P<sub>12,3</sub>), 63.8% preferred traditional surgery for great saphenous vein reflux, followed by endovenous laser ablation (24.3%), radiofrequency ablation (5.6%), and ultrasound-guided foam sclerotherapy (3.1%). Physicians in coastal China were more likely to choose endovenous thermal ablation than those from western China ( $P < .05$ ). In modified case vignettes complicated with hyperpigmentation and lipodermatosclerosis or ulceration, more participants chose traditional surgery for great saphenous vein (73.2% vs 63.8% [ $P < .001$ ]; 75.9% vs 63.8% [ $P < .001$ ]) compared with the basic case. Moreover, 31.9% preferred continuation of compression therapy for patients with varicose veins and deep venous reflux, and 65.4% preferred correction of iliac vein compression before treatment of varicose veins. Distributions of management strategies were significantly different between the basic and modified case vignettes (all  $P < .01$ ).

**Conclusions:** Both traditional surgery and minimally invasive techniques are used for patients with varicose veins in China, but traditional surgery is the mainstay of treatment for varying degrees of varicose veins. Related clinical factors, duplex ultrasound scan findings, medical insurance, and economy may have influenced the physicians' choice of treatment modality for varicose veins. (*J Vasc Surg: Venous and Lym Dis* 2018;■:1-9.)

Varicose veins affect about 25% of the adult population worldwide.<sup>1-3</sup> In China, the prevalence is reported to be 8.9%, with >100 million people suffering from the disease.<sup>4</sup> Varicose veins and associated complications may lead to decreased quality of life, loss of working days, and health care costs.<sup>3</sup> Compression therapy may alleviate symptoms, especially in the early stages of disease.<sup>5,6</sup> For patients who fail to respond to compression therapy, traditional surgery consisting of high ligation

and vein stripping (HL/S) was historically regarded as "gold standard" treatment for primary saphenous veins.<sup>7</sup> During the past decade and a half, a variety of minimally invasive techniques have become available, including endovenous laser ablation (EVLA),<sup>8</sup> radiofrequency ablation (RFA),<sup>9</sup> and ultrasound-guided foam sclerotherapy (UGFS).<sup>10</sup> Although long-term outcomes of endovenous therapies are awaited, notable clinical and quality of life benefits have been consistently reported for these new techniques.<sup>11,12</sup>

The minimally invasive procedures have largely replaced traditional surgery in Europe, North America, and South Korea and have been recommended to be the primary treatment for primary symptomatic varicose veins.<sup>13-15</sup> During the past decade, the minimally invasive procedures have been gradually introduced to China. Although China might have the largest population of patients with varicose veins, there are no national data on the diagnosis and management of chronic venous insufficiency. Moreover, there is not yet a standardized protocol for management of patients with varicose veins in combination with thrombophlebitis or iliac vein compression syndrome in China. A greater understanding of the

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current varicose vein treatment may be helpful for making clinical guidelines and for designing appropriate health care policies in China. This study aimed to analyze the current practice and management strategies for patients with varicose veins among Chinese physicians.

## METHODS

**Participants.** The survey was conducted among a sample of physicians who were attending four of the Chinese vascular surgery conferences during September 2016 to May 2017: China Endovascular Course, Thirteenth Chinese Vascular Surgery Congress, Endovascular 2016, and Vascular and Endovascular Conference 2017. Physicians were considered eligible if they were familiar with the use of traditional surgery, endovenous thermal ablation techniques, and UGFS for varicose veins and had been performing varicose vein treatments in the past year. If there were more than two physicians from the same hospital eligible and willing to participate in the survey, we included only the first two per registration time. A total of 726 eligible physicians were invited to participate in the survey. Because this survey was conducted during conference coffee breaks, 45 of them (6.2%) did not complete the questionnaire for reasons of time, resulting in a response rate of 93.8%.

**Questionnaire.** The questionnaire was designed by the core committee of the Chinese Association of Phlebology and an epidemiologist. A pilot study was conducted among 10 vascular surgeons from three hospitals in Beijing before the start of this survey. The questionnaire was modified slightly according to their advice and answers. It comprised three parts and 28 points. The first part aimed to collect data on the physicians' characteristics and clinical practices, including specialty, years of experience in treatment of varicose veins, working affiliations, location of current clinical practice, disease stages of their patients, indications for varicose vein operation, and whether medical insurance influences their choice of treatment modalities. The second part focused on obtaining information about the respondents' departments (eg, annual number of operations for varicose veins, available procedures, types of anesthesia, average hospitalization time, and cost).

The third part was designed to investigate the physicians' management choices for case vignettes of patients with varying degrees of varicose veins (Table I). The basic case vignette described a patient who had a primary great saphenous vein (GSV) reflux with a strong desire to relieve symptoms and to improve quality of life by surgery after 3 months' oral administration of venoactive drugs and 6 months' wearing of medical compression stockings without any alleviation of symptoms. Participants were asked to choose their preferred treatment for this case from a list of proposed answers: HL/S, EVLA, RFA, UGFS, and others for GSV; ambulatory

## ARTICLE HIGHLIGHTS

- **Type of Research:** Survey of physicians attending vascular conferences
- **Take Home Message:** Answers of 681 physicians from 527 hospitals to a questionnaire revealed that traditional surgery continues to be the mainstay of treatment of varicose veins in China. For treatment of simple varicose veins, traditional surgery was recommended in 63.8%, laser ablation in 24.3%, radiofrequency ablation in 5.6%, and ultrasound-guided foam sclerotherapy in 3.1%. Clinical class of the disease, deep vein reflux and obstruction, medical insurance, and local economy and customs likely influenced choice of treatment.
- **Recommendation:** Findings of this survey suggest that traditional surgery is the most prevalent treatment of varicose veins and more advanced chronic venous insufficiency in China, but the survey had significant limitations due to selection bias of the participants.

phlebectomy, sclerotherapy, transilluminated powered phlebectomy, ambulatory phlebectomy and sclerotherapy, and others for tributaries; and ligation, subfascial endoscopic perforator surgery, ultrasound-guided sclerotherapy, endovenous thermal ablation, and others for perforator veins. The term *others* included no treatment, compression therapy, and other procedures not listed. Afterward, the basic case vignette was modified step by step, changing clinical findings and duplex ultrasound (DUS) scan results (Table I, vignettes 2 to 5). Participants were then asked if they would like to change their treatment strategies for the modified cases and, if so, to indicate which procedure they would prefer.

**Statistical analysis.** Basic descriptive statistics were conducted, with results presented as numbers and percentages. Proportions of endovenous thermal ablation for varicose veins were compared between different economic regions of China using the  $\chi^2$  test. Proportions of preferred procedures were compared between the basic and modified case vignettes using the McNemar test, with multiple testing corrected by the Bonferroni method. In addition, the distributions of management strategies between the basic and modified vignettes were compared using the Bhapkar test, which is widely used to compare paired proportions between two or more groups.<sup>16</sup> All analyses were performed using SAS statistical software (version 9.3; SAS Institute, Cary, NC). Two-tailed  $P < .05$  was considered to be statistically significant.

## RESULTS

**Characteristics of the study participants.** A total of 681 vascular physicians completed the questionnaire. They

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