

CONSTRUCTION AND VALIDATION OF PREDICTIVE SCORE FOR DEVELOPMENT OF SEVERE CHRONIC VENOUS INSUFFICIENCY IN PATIENTS WITH VARICOSE VEINS

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Introduction

Although the natural evolution of varicose veins is usually benign a small subset of patients can progress to severe chronic venous insufficiency (CVI). Identification of patients at risk will contribute to the optimization of curative strategy. The purpose of our study was to determine the independent factors associated with the development of severe CVI and to construct a predictive score.

Materials and Methods

The retrospective analysis of prospectively maintained institutional database of patients with varicose veins operated during 2008-2014 was performed. Demographic, clinical data and results of duplex ultrasound and laboratory tests were retrieved for 1093 lower limbs: 755 class C2,3 and 338 class C4-6 of CEAP. The univariate analysis was performed initially and 9 factors with statistically significant difference between groups were included in multiple logistic regression. Predictive score was constructed and further validated on holdout sample of 280 lower limbs. Coordinates of ROC curves was used for determination of predictive cut-off value of constructed score.

Results

Multiple logistic regression determined 5 independent risk factors significantly associated with development of severe CVI in limbs with varicose veins. For score construction, the coefficients of regression (B) obtained for each factor were multiplied by 10, providing the following results: obesity – 13 points, significant comorbidities (included in calculation of Charlson index of comorbidity) – 8 points, hyperfibrinogenemia – 12 points, groin-to-ankle saphenous reflux – 17 points, absence of refluxing tributaries of the great saphenous vein above the knee – 11 points. Validation of the score in the holdout sample demonstrated good prognostic characteristics of the created model: area under curve ROC – 0.889 (95% CI 0.848 – 0.929), asymptotic significance $p < 0.0001$. The cut-off value of 20 points provides score sensibility of 90.8% and specificity of 64.8%.

Conclusions

There are several demographic, clinical, laboratory and hemodynamic factors associated with risk of progression of limbs with varicose veins from clinical class C2,3 to class C4-6. Constructed predictive score can be used for determination of patients who will benefit more from interventional ablation of venous reflux and for prioritization of treatment.