The natural history of the deep venous thrombosis (DVT) is characterized by a dynamic process that could involve the physiologic lysis of the clot and thrombus extension. Understanding these two competitive mechanisms is very important, because the delayed thrombus regression is supposed to be involved in the development of the post-thrombotic syndrome. While the determinant factors of the recurrent DVT are well known, it is still unclear which factors influence the recanalization of the venous thrombus. In the last few years the new gold standard method in phlebology, the duplex ultrasonography, was used to follow up the normalization rate of the venous wall and lumen after the acute phase of DVT, but without to describe in a precise, quantitative way the time of the occurrence, and the type of the recanalization process.

**Aim of the study:**
The aim of this prospective longitudinal clinical study was to evaluate the dynamics of the recanalization process (spontaneous fibrinolysis) in acute, completely occlusive, multi-level deep venous thrombosis using duplex ultrasound examination and to investigate the influence of different factors on the evolution of thrombus regression.

**Materials and methods:**
One hundred-eleven symptomatic adult patients presenting fully occlusive acute multi-level DVT (onset of symptoms less than 10 days), which were admitted to the Second Medical Clinic, Târgu Mureș, were eligible for entering the study. The location and extent of the thrombotic process was objectively documented by color duplex ultrasonography at every patient, and the total thrombus “load” was calculated, using the modified Marder score. A body-weight-adjusted dose LMWH therapy (175 anti Xa IU/kgc./24h of tinzaparin or 200 anti Xa IU/kgc./24h of enoxaparin/nadroparin) was administered from the first day for every patient, and was continued at least 7-14 days. Oral anticoagulation therapy with low dose (2mg) acenocoumarol was started on the 3rd day following the initiation of LMWH therapy. The LMWH treatment was stopped as soon as the INR value reached the 2-3 interval. The acenocoumarol administration was given for 12 months. The value of the INR was determined weekly in the first month and monthly thereafter, and the dosage of the acenocoumarol was adjusted in accordance, to keep this value between 2 and 3. This therapeutic regimen was respected in each case, with the exception of five pregnant women, who received full-dose LMWH therapy during all the pregnancy, with the initiation of the acenocoumarol thereafter, respecting the same steps. All the patients were encouraged to ambulate in the day time and the wearing of elastic support stockings (grade I compression stocking applied with the
size corresponding to the ankle, calf and thigh diameters) was prescribed from the very first day of
treatment until the end of study period (1 year).

In order to evaluate the healing process after the acute phase of DVT, 4 visits were scheduled for re-
evaluation at 1, 3, 6 and 12 months. At each occasion, a physical examination as well as a color duplex
scan was performed and recorded for each patient, and it was determined the type (“marginal” or
“cavernous”) and the degree of recanalization (in percentage with the proper software of the scanner for
“marginal” type, or with our “vein” software, special created for the study in the case of “cavernous”
type). Efficacy of the anticoagulant therapy, and the patients’ compliance with compressive elastic
hosiery wearing were carefully followed. Relationship between the degree and pattern of recanalization
and patients’ age, gender, thrombosis etiology and location were determined.

Results:
The follow-up was completed by 89 of the 111 patients: 19 of them were excluded because of low
compliance (more than two absence from scheduled visits, or inadequate INR control), 1 because of
thrombotic recurrence and 2 because of the later appearance of malignant tumour. The data of the five
pregnant women were separately analyzed. We found two main patterns of thrombus regression: the first
one with multiple channels inside the thrombus was named “cavernous” type, and the second,
characterized by the presence of wall thickening with progressive lumen diameter reduction, which we
called the “marginal” type. In the first month the cavernous type was predominant, but the pattern was
changing during follow-up. Regarding the dynamics of the recanalization this, appear to be logarithmic.
The mean value of the recanalization rate was approximately 33% after the first month, 65% after three
months of evolution, 87% after six months and almost 96% after one year. The complete recanalization
of the involved venous segments were observed in 24.39% of the cases during the follow-up period. The
dynamics of thrombus regression was faster in younger and female patients, and in those patients whose
venous segments recanalization began with the marginal type of thrombus regression. The regression
process of the thrombus was also faster and more complete under prolonged LMWH therapy in pregnant
women.

Conclusions:
In the case of efficient anticoagulant and compressive therapy, the spontaneous recanalization process of
DVT is important from the very first month of evolution. This became almost complete after 12 months
of treatment. In approximately 25% of the cases the complete re-permeabilization is observed in the first
year of evolution. The unilocular, marginal type of thrombus regression is often observed and has better
evolution than the multilocular one. The dynamics of the recanalization process is significantly
influenced by younger age, female gender and prolonged LMWH therapy.