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One-stop treatment strategy and curative effect evaluation of acute deep venous thrombosis of lower limbs

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Abstract: This paper discusses the one-stop treatment strategy and curative effect evaluation of acute lower extremity deep venous thrombosis (ADVT). ADVT, as a common vascular disease, seriously affects the quality of life of patients and may even be life-threatening. In view of the complexity and inefficiency of traditional treatment methods, this paper puts forward a one-stop treatment strategy, which integrates anticoagulant therapy, thrombolytic therapy, thrombectomy embolectomy and postoperative care and rehabilitation. Through the in-depth analysis of the clinical cases of 50 patients with ADVT in our hospital, the results show that the one-stop treatment strategy has shown remarkable effects in improving anticoagulant effect, thrombolytic effect, hemorheology and reducing edema of lower limbs. Specifically, about 80% patients' APTT and INR values are stable within the target range, and 70% patients' thrombi are significantly reduced. After treatment, the average blood viscosity is reduced by 14.8%, the erythrocyte deformability is improved by 16.9%, the average lower limb circumference is reduced by 4.6cm, and the edema reduction percentage is 10.9%. This study not only provides new ideas and methods for the treatment of ADVT, but also verifies the effectiveness and safety of one-stop treatment strategy through scientific evaluation methods, which provides strong evidence support for clinical practice.

1. Introduction

Acute deep venous thrombosis of lower limbs (ADVT) is a common vascular disease, which is mainly caused by abnormal blood coagulation in deep veins of lower limbs, blocking vascular lumen, resulting in venous reflux disorder. The disease not only causes pain and swelling of lower limbs, but also may lead to pulmonary embolism in severe cases, endangering patients' lives [1-2]. In recent years, with the change of people's lifestyle and the arrival of an aging society, the incidence of ADVT has increased year by year, which has become a medical problem that seriously affects public health.

Traditionally, the treatment of ADVT usually involves multiple steps and different treatment methods, which may lead to complicated treatment process and low efficiency, and even increase the pain and recovery time of patients [3]. Therefore, it is particularly important to explore a more efficient and comprehensive treatment strategy. One-stop treatment strategy is based on this demand.

One-stop treatment aims to provide patients with a coherent and efficient treatment scheme by integrating various treatment methods, thus reducing the inconvenience and pain in the treatment process [4-5].

Through the in-depth analysis of actual clinical cases, this study hopes to provide new ideas and methods for the treatment of ADVT in order to improve the treatment effect and quality of life of patients. At the same time, this study will also objectively evaluate the curative effect of one-stop treatment strategy in order to provide strong evidence support for clinical practice.

2. Materials and methods

2.1. Data sources

In this study, ADVT patients admitted to our hospital from January 2021 to December 2022 were selected as the study objects. All the selected patients were confirmed by strict diagnostic criteria, including ADVT confirmed by color Doppler ultrasound or venography, accompanied by typical clinical manifestations such as swelling and pain of lower limbs [6-7]. In order to ensure the accuracy and reliability of the study, patients were excluded if they had other serious complications or complications.

Specific screening criteria are as follows:

(1) Patients diagnosed with ADVT.

(2) Age and sex are not limited, but pregnant women and lactating women are excluded.

(3) There were no other serious cardiovascular, cerebrovascular, respiratory diseases, liver and renal insufficiency and other complications that affected the research results.

(4) The patient or his family signed an informed consent form and volunteered to participate in this study.

According to the above criteria, 50 eligible ADVT patients were selected as the research object of this study. Among these patients, there were 28 males and 22 females, ranging in age from 25 to 75, with an average age of 55. The detailed medical records, treatment plans and follow-up data of all selected patients were completely recorded and used for subsequent analysis and research. At the same time, this study strictly follows the principles of medical ethics to ensure the privacy and rights of patients are protected.

2.2. Therapeutic method

One-stop treatment strategy is adopted for the selected ADVT patients, aiming at improving the treatment effect and reducing the pain of patients through comprehensive treatment methods. The specific steps of one-stop treatment strategy are as follows:

(1) Anticoagulation therapy

All patients first receive anticoagulant therapy to prevent further formation and spread of blood clots. Commonly used anticoagulant drugs include heparin and warfarin. The specific medication regimen and dosage are adjusted according to the patient's specific condition. The initial dose of heparin is calculated by intravenous injection based on body weight, and the dose is then adjusted according to the activated partial thromboplastin time (APTT) [8]. Warfarin treatment begins with an overlap with heparin, and the dose is adjusted based on the international normalized ratio (INR), with the target INR maintained between 2.0-3.0.

(2) Thrombolytic therapy

On the basis of anticoagulant therapy, patients who are suitable for thrombolytic therapy are given thrombolytic therapy. Thrombolytic drugs such as urokinase and alteplase are used to accelerate the dissolution of thrombus. Urokinase is administered by intravenous injection, and the

dosage is adjusted according to the patient's weight and the severity of thrombosis [9-10]. Thrombolytic therapy is carried out under strict monitoring to ensure the safety and effectiveness of treatment.

(3) Thrombotomy

For patients with poor thrombolytic effect or large thrombus, we will consider embolectomy. During the operation, the doctor will send the thrombus removal device to the thrombus site through the catheter and take out the thrombus. This method can quickly restore vascular patency and alleviate the symptoms of patients.

(4) Postoperative nursing and rehabilitation

One-stop treatment also includes careful nursing and rehabilitation plan after operation. Patients will receive regular examination and evaluation to ensure the treatment effect and adjust the treatment plan in time. This includes physical therapy, wearing pressure socks and regular Doppler ultrasound examination to monitor thrombosis.

In this study, the above-mentioned one-stop treatment strategy is strictly followed, and a personalized treatment plan is formulated for each patient in order to achieve the best treatment effect. At the same time, we also attach importance to patients' feedback and experience, constantly optimize the treatment process, and improve patients' satisfaction and quality of life. Always follow the principles of medical ethics in the whole treatment process to ensure that the privacy and rights of patients are fully protected.

2.3. Therapeutic effect evaluation method

In order to ensure the comprehensive and objective evaluation of the effect of one-stop treatment strategy, this study has formulated a series of scientific evaluation criteria, involving a number of key indicators. First of all, the anticoagulant effect is evaluated by monitoring APTT and INR to ensure that these indexes are maintained within the target range, thus confirming the stability and effectiveness of anticoagulant therapy. Secondly, the thrombolytic effect is monitored by regular color Doppler ultrasound examination, and the improvement of patients' symptoms such as lower limb pain and swelling is recorded. In addition, hemorheology was used to observe the improvement of blood viscosity and erythrocyte deformability after treatment, so as to evaluate the positive effect of treatment on blood circulation. Finally, the circumference of patients' lower limbs is measured regularly by using circumference measuring instrument, and the degree and speed of reducing edema of lower limbs are evaluated by combining patients' self-report and doctors' clinical observation.

3. Result

3.1. Basic information of patients

ADVT patients included in this study have a wide range of ages, mainly middle-aged and elderly people; Male patients are slightly more than female patients; There are many causes of the disease, among which sedentary or standing for a long time is the most common. Among the 50 patients, 28 were male, accounting for 56%. There were 22 female patients, accounting for 44%. The gender ratio is relatively balanced, but there are slightly more male patients than female patients. Slow blood flow during postoperative rehabilitation, history of varicose veins and long-term bed rest after trauma are also important causes. Some patients have a history of chronic diseases such as hypertension, hyperlipidemia and diabetes, which increases the risk of ADVT. The cause of a few patients is unknown, and further study is needed.

3.2. Curative effect evaluation results

3.2.1. Anticoagulation effect evaluation

APTT and INR were closely monitored during anticoagulant therapy. Through regular examination of patients' blood samples, the study found that most patients' APTT and INR can be stabilized within the target range. After a period of anticoagulant therapy, the APTT and INR values of about 80% patients have reached the expected therapeutic effect, showing the stability and effectiveness of anticoagulant therapy. These patients' symptoms such as swelling and pain of lower limbs have been obviously improved, and there is no obvious bleeding tendency or other adverse reactions. However, there are also a few patients whose APTT and INR values fluctuate greatly, so it is necessary to adjust the dosage of anticoagulant drugs or change drugs to achieve the ideal therapeutic effect. Further examination and evaluation are carried out for these patients to ensure the safety and effectiveness of their treatment.

3.2.2. Evaluation of thrombolytic effect

During thrombolytic therapy, the size and morphological changes of thrombus were regularly monitored by color Doppler ultrasound. The results showed that after thrombolytic therapy, most patients' thrombi tended to dissolve or shrink obviously. After receiving thrombolytic therapy, about 70% patients' thrombi have significantly reduced in size and changed in morphology, indicating that thrombolytic drugs have effectively promoted the dissolution of thrombi. After thrombolysis, the symptoms of lower limb pain and swelling have also been significantly improved, and the quality of life has been significantly improved. There are also about 30% patients with slow thrombolysis or no obvious change, which may be related to the individual differences of patients, the severity of the disease or the dose and course of thrombolytic drugs. For this part of patients, it may be necessary to adjust the treatment plan, such as increasing the dosage of thrombolytic drugs or changing the type of drugs, in order to achieve better thrombolytic effect. In addition, it was observed that after thrombolytic therapy, all patients did not have serious bleeding tendency or other adverse reactions, which indicated that our thrombolytic therapy scheme was safe.

3.2.3. Evaluation of hemorheology improvement

The average blood viscosity of patients before treatment was 4.52 mPa s, but after one-stop treatment, the average blood viscosity decreased to 3.85 MPa s. The average change is-0.67 MPa s, which means that the blood viscosity of patients generally decreases after treatment, and the improvement percentage reaches 14.8%. The reduction of blood viscosity is helpful to reduce blood flow resistance, improve blood circulation efficiency and have a positive impact on patients' health recovery. As far as erythrocyte deformability is concerned, the average erythrocyte deformability of patients before treatment was 64.3%, and this index increased to 75.2% after treatment. The average variation is +10.9%, and the improvement percentage is as high as 16.9%. The improvement of red blood cell deformability means that red blood cells can change shape more flexibly when passing through narrow blood vessels, thus maintaining smooth blood flow. This is of great significance for preventing thrombosis, improving microcirculation and improving tissue oxygen supply. See Table 1 for details.

One-stop treatment strategy has shown remarkable effect in improving hemorheology of ADVT patients. By reducing blood viscosity and improving erythrocyte deformability, this strategy is helpful to improve patients' blood circulation and create favorable conditions for patients' rehabilitation.

Table 1: Evaluation results of hemorheology improvement

Statistical index	Before treatment	After treatment	variable quantity	Improvement percentage
Blood viscosity (mPa s)	4.52 (0.35)	3.85 (0.28)	-0.67 (0.18)	14.8% ↓
Erythrocyte deformability (%)	64.3 (4.6)	75.2 (3.9)	+10.9 (2.1)	16.9% ↑

3.2.4. Assessment of edema reduction of lower limbs

The treatment strategy of this study has a significant effect on reducing the edema of lower limbs in patients with ADVT, and the circumference of lower limbs is obviously reduced, and the degree of edema is effectively improved, and the treatment effect is generally good (see Table 2).

Table 2: Evaluation results of edema reduction of lower limbs

Mean circumference of lower limbs before treatment (cm)	41.8	Maximum edema reduction (cm)	7
Average circumference of lower limbs after treatment (cm)	37.2	Minimum amount of edema reduction (cm)	2
Average edema reduction (cm)	4.6	Number of patients with edema not relieved or aggravated	0
Average edema reduction percentage (%)	10.9%		

Before treatment, the average circumference of patients' lower limbs was 41.8cm, which indicated that patients generally had obvious edema of lower limbs. After treatment, the average peripheral diameter of the patients' lower limbs was reduced to 37.2cm, which showed that the treatment could significantly improve the edema of lower limbs. The average reduction of edema was 4.6cm, which indicated that the edema of lower limbs was effectively reduced in most patients. The average percentage of edema reduction was 10.9%, which further confirmed the positive effect of treatment on edema of lower limbs. The maximum amount of edema relief reached 7cm, and the minimum amount was 2cm, indicating that the treatment could improve edema of different degrees. No patient had edema that was not relieved or aggravated, which indicated that the treatment strategy in this study was generally effective in relieving edema of lower limbs.

4. Discussion

In recent years, the one-stop treatment strategy has gradually attracted the attention of the medical community. Its core idea is to provide patients with a comprehensive and comprehensive treatment plan, aiming at maximizing the treatment effect and reducing the pain of patients. Compared with traditional surgical methods, one-stop treatment shows significant advantages in many aspects [11].

From the point of view of trauma, one-stop treatment usually adopts minimally invasive techniques, such as catheter thrombolysis and balloon dilatation, which significantly reduce the trauma to the patient's body. In contrast, traditional surgical methods often require a larger incision, which increases the pain of patients and the difficulty of postoperative recovery [12]. One-stop treatment also has obvious advantages in recovery time. Due to the application of minimally invasive technology, the postoperative recovery time of patients is greatly shortened. This can not only reduce the financial burden of patients, but also make patients return to normal life and work more quickly. However, the traditional surgical method needs a longer recovery period because of

the greater trauma. In terms of complications, one-stop treatment strategy can effectively reduce the incidence of complications by comprehensively evaluating the overall situation of patients and formulating personalized treatment plans. However, traditional surgical methods are easy to cause various complications, such as infection and bleeding, due to factors such as large surgical trauma and long recovery time [13].

Efficacy evaluation is an indispensable part of medical research. Scientific evaluation methods can objectively and accurately reflect the treatment effect, which not only helps doctors to understand the recovery of patients, but also provides a strong basis for clinical decision-making. In this study, a variety of evaluation indicators were used to comprehensively evaluate the efficacy of one-stop treatment strategy. These evaluation results not only provide valuable clinical data, but also provide a direction for the follow-up treatment plan optimization.

In this study, the influence of patients' age, onset time, thrombus location and other factors on the treatment effect was analyzed. The results show that the curative effect of young patients is generally better than that of old patients, which may be related to the decline of physical function and many complications of old patients. In addition, the onset time and the location of thrombus also have a significant impact on the therapeutic effect. Early detection and timely treatment of patients, its therapeutic effect is significantly better than that of patients found late; However, the treatment difficulty and effect of thrombus in different parts are also different. The analysis of these influencing factors is helpful to understand the treatment law of ADVT more deeply and provide reference for making more personalized treatment plan.

While this study demonstrates the potential benefits of the one-stop treatment strategy for ADVT, there are some limitations that should be addressed in future research. The sample size of 50 patients is relatively small, and a larger cohort would provide more robust evidence. Additionally, a longer follow-up period would be beneficial to assess long-term outcomes and potential complications. Future studies should also consider comparing the one-stop treatment strategy directly with traditional treatment methods in a randomized controlled trial to further validate its efficacy.

5. Conclusion

One-stop treatment strategy provides a coherent and efficient treatment scheme for ADVT patients. Through the integration of anticoagulation, thrombolysis and embolectomy, combined with careful nursing and rehabilitation plan after operation, this strategy significantly improved the treatment effect and reduced the pain and recovery time of patients. One-stop treatment strategy provides an efficient and comprehensive treatment choice for ADVT patients, and its curative effect is supported by objective evaluation. This study provides strong evidence for clinical practice and helps to improve the treatment effect and quality of life of patients.

Future directions for research in this area should include:

1) Investigating the cost-effectiveness of the one-stop treatment strategy compared to traditional methods.

2) Exploring the applicability of this approach to different subgroups of ADVT patients, such as those with comorbidities or at high risk of bleeding.

3) Developing standardized protocols for the one-stop treatment strategy to ensure consistent implementation across different healthcare settings.

4) Assessing patient satisfaction and quality of life outcomes in addition to clinical measures.

In conclusion, the one-stop treatment strategy shows promise as an effective approach for managing ADVT, potentially revolutionizing the care pathway for these patients. Continued research and refinement of this strategy will be crucial in optimizing outcomes for individuals

suffering from this challenging condition.

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