

Effect of Intermittent Pneumatic Compression on The Prevention of Postoperative Deep Venous Thrombosis During Laparoscopic Radical Resection Oof Rectal Cancer

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Abstract

Objective to investigate the effect of intermittent pressure instrument on the prevention of deep venous thrombosis (DVT) after radical operation of laparoscopic gynecologic malignancies. Methods in our hospital from November 2016 to December 2016 in our hospital laparoscopic surgery for gynecological malignant tumor resection in 140 patients as the experimental object, were randomly divided into control group (Application of elastic stockings in the operation) and observation group (air pressure instrument with intermittent operation) in 70 cases, bleeding rate and surgery the incidence of DVT were observed in two groups. Results the incidence of DIV in the control group was 8.57%, while the incidence of DIV in the observation group was only (P<0.05), and the incidence of DVT was significantly lower. In addition, there was no significant difference between the control group and the experimental group in the amount of intraoperative bleeding, indicating that intermittent pneumatic pressure meter does not increase the amount of intraoperative bleeding. Conclusion the use of intermittent pressure instrument in laparoscopic gynecologic malignant tumor radical operation can significantly reduce the incidence of postoperative DVT, and has high clinical value.

Keywords

DVT; Intermittent Pneumatic Compression; Gynecologic Malignant Tumor; Laparoscopic surgery.

1. Introduction

The definition of deep vein thrombosis(DVT) refers to deep vein cavity caused by abnormal blood coagulation of deep vein cavity blockage and the blood returning blocked, eventually lead to clinical symptoms of disease, including pulmonary embolism and thrombosis syndrome[1]. Compared to other diseases, DVT had obvious high morbidity and mortality. According to U.S. official statistics, more than 70 thousand patients die from pulmonary embolism each year, and approximately 500 thousand patients with DVT in the United States. In addition, the probability of postoperative DVT in patients with malignant tumors is 4~6 times that of patients with nonmalignant tumors. The patients with gynecological malignant tumor because of the special location of the tumor, the probability of occurrence of deep venous thrombosis in patients with gynecological malignant tumor after up to 26.8%[2].The incidence of deep venous thrombosis will seriously delay the timing of treatment of patients, increase the suffering of patients, serious when still can be complicated by pulmonary embolism, threaten the life safety of patients [3].

Therefore, how to reduce the incidence of patients with DVT. Nursing problems has become an urgent

The study found that during the operation of patients with GEC [4], drug assisted [5] and intermittent pressure pump system [6] and nursing intervention measures can reduce the postoperative incidence of DVT. Intermittent IPC has the advantages of simple operation, high patient comfort, safe use, side effects are considered small, is the most safe and effective method to prevent DVT[7]. The laparoscopic operation has small wound, and small operation on patients with the system features quick recovery, for the majority of our hospital gynecological malignant tumor radical operation by

laparoscopy[8]. Therefore has completed, this paper will discuss laparoscopic gynecological malignant tumor radical with intermittent pressure pump operation effect on prevention of deep venous thrombosis after operation. The data reported are as follows:

2. General information and methods

2.1 General information

In this study, we selected 140 patients who underwent laparoscopic radical surgery for gynecologic malignancies from November 2016 to December 2016 in our hospital as the experimental subjects.

Selection criteria: no serious disturbance of consciousness, non allergic, blood coagulation dysfunction, serious diseases, acute or chronic infection, preoperative coagulation function examination showed hypercoagulable state, ultrasound examination for DVT, coagulation index, drug use effect of previous history of thrombosis, severe lower extremity arteriosclerosis, ischemic vascular or other leg a serious disease, peripheral vascular disease and deformity.

This study was approved by the nursing department of our hospital, the patient and family members signed the informed consent.

The patients were randomly divided into digital table method will be chosen as the control group and the observation group with 70 cases in each group, the control group patients aged 29~69 years, mean age (39.4 + 7.9), 21 cases of endometrial carcinoma, 34 cases of patients with cervical cancer, 15 cases of ovarian cancer patients, the longest operation time 360 minutes, the shortest is 134 minutes, the average operation time was (224 + 56) minutes. The patients in the observation group were 27~72 years of age, the average age (41.5 + 8.4) years; 22 cases of patients with endometrial carcinoma, 23 cases of patients with cervical cancer, 25 cases of ovarian cancer, surgery time the longest 341 minutes, the shortest is 146 minutes, the average operation time was (214 + 72) minutes. The observation group and the control group in the information age of all patients, the operation time were compared, the difference was not statistically significant ($P>0.05$), the experimental analysis of two groups of patients.

2.2 Methods

In the experiment of all patients underwent routine preoperative therapy: all patients admitted to the hospital after the DVT risk assessment of the risk, according to the DVT grade is divided into high risk, low risk, moderate risk and high risk; on the basis of knowledge of conventional DVT pathogenesis, clinical symptoms and some related preventive measures are of the patients; inform patients need more water, reasonable collocation, do not drink, do not smoke diet to maintain a good lifestyle on postoperative recovery and prevention of the occurrence of DVT positive significance.

Control group

Theatre nurses instruct the patients to wear progressive compression socks in the operation area, and every 30 minutes to see patients with lower limb blood supply during the operation (by monitoring the temperature and pulsation of dorsal artery of foot).

Observation group

- (1) Theatre nurses checking the pressure band and power supply of charging system of the intermittent inflation pressure pump before operation.
- (2) Theatre nurse helps the patient to wear the intermittent pneumatic pump system, after the patient laying on the operating bed.
- (3) The intermittent IPC is adjusted to "intermittent pressure" mode, from ankle to thigh leg began to pressure. In the system pressure is set to 45mmHg (1mmHg=0.133kPa), 35mmHg, 30mmHg. The maximum pressure duration is set to 11 seconds for evacuation and full filling of the lower extremities. System automatic decompression time is set to 60 seconds. In patients during surgery has been the use of intermittent IPC.

(4) During the operation to observe whether there is a system of cuff release, if it is found that the system cuff release, should be timely to re wrapped. Theatre nurse should be every 30 minutes to observe the patient's skin color, pay attention to the state observation of patients with lower extremity peripheral blood (and double skin temperature monitoring and pulsation of dorsal artery of foot). If there is a special situation should immediately stop using the intermittent IPC.

2.3 observation index

Taking the double venous color Doppler examination for all the patients were checked by, In the 24 hours before surgery and 24 hours after the operation[9].

(1) observe the echo of the thrombus in the vein cavity. If the vein of the vein is hypoechoic or anechoic, it can be diagnosed as DVT.

(2) observation of lower extremity venous color Doppler image, if the presence of thrombus imaging, venous wall, intermittent intravenous cavity can not be compressed measuring the amount of bleeding during surgery in patients with the occurrence of DVT after surgery.

2.4 statistical methods

All data were analyzed using SPSS 17 statistical software. The quantitative data is expressed by means of average + standard deviation. The independent samples t test and chi square test were used for statistical analysis. $P < 0.05$ was statistically significant.

3. Result

In the control group, 6 cases of DVT occurred in 70 cases, and the incidence of DVT was 8.57%. In the observation group, 2 cases of DVT occurred in 70 cases, and the incidence of DVT was 2.86%. There was no significant difference in the amount of bleeding between the control group and the observation group. The incidence of DVT in the observation group was significantly lower than that in the control group, the difference between the two groups was more significant, with statistical significance. Detailed data are shown in table 1.

Tab. 1 The incidence of DVT in control group and observation group

groups	DVT	None DVT	Total
control group	6(8.57%)	62	70
observation group	2(2.86%)	68	70
statistical analysis	$\chi^2=7.2748$ $P=0.0106$		

In the control group DVT in patients with endometrial cancer occurred in 2 cases, the incidence rate of DVT was 9.52%; 3 cases of DVT in cervical cancer patients, the incidence rate of DVT was 8.82%; 1 cases of DVT patients with ovarian cancer, the incidence of DVT was 6.67%. In the observation group DVT in patients with endometrial cancer occurred in 1 cases, the incidence rate of DVT was 4.55%; 0 cases of DVT in cervical cancer patients, the incidence rate of DVT was 0%; 1 cases of DVT patients with ovarian cancer, the incidence of DVT was 4%. There was no significant difference in the amount of bleeding between the patients in the control group and the observation group. After the use of intermittent inflation pressure apparatus, the incidence of DVT in all the tumor types in the control group was significantly decreased, the difference between the two groups was statistically significant, statistically significant. Detailed data are shown in table 2.

Tab.2 The different cancer patients' incidence of DVT in control group and observation group

Groups	Cancer	DVT	None DVT
control group	Endometrial Carcinoma	2(9.52%)	18
	Cervical cancer	3(8.82%)	30
	Oophoroma	1(6.67)	14
observation group	Endometrial Ccarcinoma	1(4.55)	21

Cervical cancer	0(0%)	24
Oophoroma	1(4%)	24

4. Discussion

DVT likely cause thrombophlebitis, an post thrombotic syndrome etc.. At the same time, DVT may lead to fatal pulmonary embolism, seriously affect the postoperative recovery and quality of life, and endanger the lives of patients. The study found that physical or drug intervention for patients can effectively reduce the postoperative incidence of DVT during the operation[10]. Therefore, nurses in operation room must pay attention to the prevention of DVT during the operation.

The results of this paper show that, In the control group only received routine prevention and operation of GEC in 70 cases there were 8 cases of deep venous thrombosis, the incidence rate was 11.43%; while the observation group using intermittent pneumatic pressure instrument of nursing intervention during the operation in 70 patients occurred only 2 cases of DVT, the incidence rate was 2.86%. Therefore, the clinical efficacy of the observation group was better than that of the control group in the prevention of DVT. The results of this study also show that the use of intermittent inflation pressure apparatus can reduce the incidence of DVT in different laparoscopic gynecologic radical surgery[11].

Intermittent IPC can provide continuous and circumferential pressure gradient acceleration, lower extremity venous blood flow velocity, pressure and promote venous emptying, produce pulsatile blood flow, reduce blood clotting factor on vascular endothelium adhesion and aggregation, reduce the incidence rate of DVT [12-13]. At the same time, intermittent IPC can promote the dissolution of fibrin, increase the activity of fibrinolytic system, inhibit the activation of procoagulant substances, prevent thrombosis, and of preventing DVT.

5. Conclusion

This paper studied the application of intermittent IPC in laparoscopic radical operation for gynecologic malignant tumor to reduce the incidence of DVT after operation. The experimental results show that the intermittent IPC promotes the venous blood return during laparoscopic radical operation of gynecologic malignant tumor, reduces the pressure in vivo, and effectively reduces the incidence of DVT. Therefore, intermittent IPC has positive significance to reduce the occurrence of DVT after laparoscopic radical operation of gynecological malignant tumor, and has the value of further clinical popularization and application.

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