

Application Effects of Total Percutaneous Technique in Endovascular Repair of Abdominal Aortic Aneurysm

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Funding: Shanghai Fourth People's Hospital Medicine Discipline Boosting Plan (SY-XKZT-2020-2005); Shanghai Fourth People's Hospital Medicine Discipline Boosting Plan (SY-XKZT-2020-1005)

Abstract: Objective: To investigate the effectiveness of total percutaneous technique in endovascular repair of abdominal aortic aneurysm. **Methods:** Divide patients into two groups based on random tests. The control group received conventional treatment, and the experimental group received modified treatment. The changes in self-management ability, comfort level and recovery time before and after treatment were compared between the two groups. **Results:** The comfort level and self-management ability of the experimental group were significantly higher than that of the control group, and the recovery time was significantly shorter than that of the control group. The difference was statistically significant ($P < 0.05$). **Conclusion:** Puncture suture can safely and effectively repair the intracavity of abdominal aortic aneurysm.

Keywords: Total percutaneous technique; Abdominal aortic aneurysm; Endovascular repair

Publication date: January, 2021

Publication online: 31 January, 2021

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1 Introduction

Abdominal aortic aneurysm (AAA) is the most common of all abdominal aortic aneurysms. The

most common feature is the gradually limited and irreversible expansion of the abdominal aortic wall. If left untreated, it will eventually rupture and is often life-threatening. AAA is more common in the elderly. In the elderly, the average age of onset of AAA is mostly over 60 years old. Clinically, AAA refers to the lesion located below the level of the renal artery, and the lesion located above the renal artery is called thoracoabdominal aortic aneurysm. The most fundamental cause of AAA is the decomposition of elastic fibers and collagen fibers in the abdominal aortic wall, which will significantly reduce the mechanical strength of the blood vessels, causing part of the blood vessel walls to expand and form aneurysms. Many patients with AAA do not have the clinical symptoms that often occur during physical examination. The patient's symptoms include abdominal pulsating lumps, pain, pressure symptoms, embolism symptoms and rupture symptoms^[1]. Currently, due to the small trauma and fast recovery, endovascular repair has become an important method for the treatment of abdominal aortic aneurysms. Traditional endovascular repair requires surgical exposure of bilateral common femoral arteries to establish a method, which leads to a high incidence of related complications. With the emergence of vascular suture devices and the accumulation of surgical experience in recent years, percutaneous dural aortic

repair has become a widely used, safe and effective treatment method. Combining literature reports and clinical experience from June 2019 to May 2020, our hospital adopted a total percutaneous stitching technique to repair abdominal aortic aneurysms and has achieved satisfactory results. The results are as follows:

2 Information and Method

2.1 Information

We selected 50 patients with abdominal aortic aneurysm admitted during June 2019 to May 2020 for the study. All patients have been completely punctured. All patients were diagnosed with abdominal aortic aneurysm through preoperative CT and angiography. Based on the random number table, 25 cases were randomly assigned to the control group and 25 cases were randomly assigned to the experimental group. The control group consisted of 14 men and 11 women, aged 45 to 72 years, and there were 13 men and 12 women in the experimental group, aged 46 to 74 years. The difference was statistically significant ($P < 0.05$). This study has been approved by the ethics committee.

2.2 Methods

2.2.1 Surgical Methods

All patients were diagnosed with abdominal aortic aneurysm through enhanced CT scan of the abdominal aorta before surgery. The artery should be cut and sutured during the operation to prevent bleeding at the puncture site. All patients received general anesthesia. Before implanting the stent, the stapler is pre-positioned by applying two vascular sutures to the two femoral arteries. After inserting and correcting the stent, tighten the suture and close the arterial puncture hole. After getting off work, manually press the puncture area on the platform. After returning to the ward, the vital signs were monitored. Observe the blood circulation, sensory and motor nerve functions of the lower limbs. Prevent lung infections and deep vein thrombosis in the lower extremities. Instruct patients to perform functional exercises and psychotherapy^[2].

2.2.2 Pre-operative Care Methods

The control group and the experimental group received Tpevar treatment by the same cardiothoracic

surgeon. The control group received conventional care after operation, and the experimental group received modified care. In order to promote hemostasis at the puncture site, the control group pressed the puncture site for 30 minutes after the operation. To promote wound healing, self-adhesive bandages were used to fix the groin for 48 hours, and sandbags were applied for 6 hours to prevent bacterial infection. Preoperative care: Before surgery, appropriate inhalation of low-flow oxygen according to the patient's cardiopulmonary function can improve the patient's blood oxygen saturation and cardiopulmonary function. In order to avoid the rupture of abdominal aortic aneurysm, patients should eat light foods that are easy to digest, have low irritation and are rich in crude fiber, and drink plenty of water. If the patient has difficulty defecation or constipation, he/she should be treated according to his/her own situation. In order to observe the progress of the patient's condition, it is necessary to monitor changes in blood pressure, heart rate and other important indicators in real time. If the patient suddenly develops symptoms such as back pain, high blood pressure, and shock, etc., he/she must immediately be prepared for emergency surgery.

2.2.3 Post-operative Care

In order to speed up the recovery of patients, the time of compression at the puncture site in the experimental group was changed to 10 minutes. After compression, the patient was fixed in the groin area with a self-adhesive bandage for 12 hours, and then the patient was asked to move the hip joint for 6 hours. In order to improve postoperative comfort, patients in the experimental group did not use sandbags after surgery. Vital signs such as blood pressure and heart rate should be continuously monitored after the operation. If there is any change, you should report it to your doctor in time and take appropriate measures according to your conditions. At the same time, pay attention to observe the blood circulation and puncture of the patient's lower limbs to avoid complications such as thrombosis^[3].

2.3 Observation Indicators

In this study, the Kolkaba Comfort Scale was used as an indicator of patient comfort after surgery. The Kolkaba Comfort Scale evaluates the comfort of patients from four aspects: environment, physiology, psychology and social culture, and the score is

directly proportional to comfort. Meanwhile, we use the Pap index scoring method to evaluate the recovery level of patients' self-management ability after surgery. The Barthel index represents the patient's self-treatment level, and the score is directly proportional to the patient's self-treatment level. Meanwhile, medical staff recorded the bedbound time, hospitalization and complications of the two groups of patients.

2.4 Statistical Methods

The SPSS19.0 software was used for statistical analysis, and the common femoral artery diameter before operation and one month after operation were compared by one-way analysis of variance. $P < 0.05$ indicated that the difference was statistically

significant.

2 Results

Compared with the control group, the Barthel index and the Kolkaba score of the experimental group after nursing care were significantly higher than those of the control group. After the statistical significance test, the difference between the two groups was found to be statistically significant. Comparing the time spent in bed, hospital stay and the incidence of complications between the two groups, the time spent in bed and hospital stay in the experimental group were significantly shorter than those of the control group.

Table 1. Patients Scoring Results Analysis

Group	No. of Cases	Barthel Index	Kolkaba Score
Experimental	24	77.01±5.82	79.07±7.34
Control	23	62.23±7.37	68.52±10.86
1	-	9.32	5.4
<i>P</i>		<0.05	<0.05

3 Discussions

In recent years, China is gradually aging, and the incidence of AAA is increasing. Since AAA is not self-evident, it will eventually rupture if not treated early. Once ruptured, the mortality rate is high, so that more and more attention is paid to treatment. Currently, the main purpose of treatment is to prevent tumor rupture and extend the life of the patient. AAA Patients with clinical symptoms and rupture urgently need surgical treatment, but there is no clear early surgical intervention standard for patients with minor AAA without clinical symptoms. Studies have shown that the diameter of abdominal aortic aneurysm is the most important risk factor for tumor rupture. For patients with tumors less than 5.5 cm in diameter, there was no significant difference in overall mortality and long-term survival between patients who received early surgical intervention and patients who received conventional monitoring and delayed surgery. Abdominal aortic aneurysm resection and artificial angioplasty have been used to treat abdominal aortic aneurysms for many years, and they are still the main modalities at home and abroad. Compared with the past, the progress of surgical technology, the continuous development of anesthesia and the continuous improvement of intensive care

technology have greatly improved the effectiveness of open surgery in the treatment of AAA. The safety guarantee of surgical operation is far from this, which greatly improves the preoperative and postoperative survival rate of AAA^[4].

The invention of the Perclose P'roGlide vascular stapler is based on the design principle of vascular suture. After the 26F sheath is pulled out, two vascular staplers can be used to suture the vascular puncture port. According to many reports in the literature, the percutaneous puncture suture technique is safe and effective. Compared with the traditional femoral artery incision, it has the advantages of less trauma, shorter operation time and postoperative bedbound time, less bleeding, higher patient comfort and fewer complications^[5]. It can also be performed under local anesthesia, which can significantly reduce the risk of anesthesia in elderly and high-risk patients. In the treatment of intravascular aneurysms, when the branch is connected and the main stent is released, the branch transmission sheath must be contracted and reinserted into the artery sheath. At this time, the operator must continuously press the puncture hole to stop bleeding, which increases the exposure time to radiation. In addition, since the perforation is large, it is difficult to stop bleeding by pressing, and the bleeding is more serious. The original 10F

arterial sheath can be reinserted using the improved method used in this study. When the branch needs to be reinserted, loosening the blue wire can reduce radiation exposure time and blood loss^[6]. The average intraoperative blood loss and operation time of this group were lower and shorter than the traditional percutaneous intravascular aneurysm stitching technique reported in the literature. The incidence of complications associated with this method is also very low. Compared with the use of the aortic sheath for percutaneous suture and repair of intravascular aneurysms, the improved puncture and suture technique proves the effectiveness of this method by saving the cost of two aortic sheaths without increasing blood loss and operation time. It not only achieves complete minimally invasiveness, but also meets the psychological expectations of patients. It also solves the shortcomings of traditional abdominal aortic aneurysm surgery, which requires bilateral groin incisions and has many potential complications such as bleeding, infection and lymphatic leakage. Therefore it is widely popular with patients and doctors.

However, due to the difficulties of advanced technology, few vascular surgery centers in China can perform this kind of surgery, and there is no comprehensive care program for such patients. Our department explored the care for this group of patients based on their clinical experience and professional skills^[7]. With conventional hemangioma repair management as the foundation, strict monitoring of vital signs, timely treatment of pain and other complications, and adjustment of drugs in accordance with the doctor's guidance are the main points of pre-operative and postoperative management of the puncture site after the abdominal aortic aneurysm is completely punctured. As the diameter of the puncture point is larger than that of the conventional puncture point, complications such as bleeding, pseudoaneurysm and arteriovenous fistula are prone to occur, and due to the suture at the puncture point,

there are local infections, arterial thrombosis, arterial dissection and other related issues^[8]. Carefully observe and follow up. Insufficient treatment can lead to undesirable consequences. Due to the advanced total percutaneous technique, the incidence of complications after most traditional abdominal aortic aneurysms is greatly reduced. However, nursing work cannot be relaxed. Do a good job in preventing lung infections and deep vein thrombosis in the lower extremities, actively communicate with patients and their families, and strengthen psychological treatment.

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