Application analysis of seamless nursing care in patients undergoing heart valve replacement surgery

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Introduction. Exploring the practical application effect of seamless nursing in patients undergoing heart valve replacement surgery.
Methods. A retrospective analysis was conducted on 60 patients who underwent heart valve replacement surgery in our hospital from February 2020 to February 2022. Patients were randomly divided into a test group (30 cases) and a reference group (30 cases), with the test group receiving seamless care and the reference group receiving routine care. Compare the effectiveness of surgical cooperation, surgical time, probability of adverse events, patient status, and quality of life scores between two groups of patients.
Results. Compared to the reference group, the test group spent less time on surgery and hospitalization, and there is a statistically significant difference between the two groups of data ($P<0.05$). At the same time, two groups of patients were compared in terms of surgical satisfaction. The satisfaction rate of the test group was 96.66%, while the satisfaction rate of the reference group was 70.00%. There was statistical significance in the comparison between the two groups of data. At the same time, in the comparison of quality of life, the test component values were also higher.
Conclusion. Compared with conventional nursing methods, using interstitial free care during heart valve replacement surgery can effectively reduce the surgical risk of patients and improve the surgical effect. At the same time, more patients also prefer seamless care, resulting in better patient satisfaction and better quality of life. The application of seamless care in clinical surgery has important reference significance for the development of heart valve replacement surgery and patient care.
Keywords. Seamless care; Efficacy; Heart valve replacement surgery; Quality of Life

INTRODUCTION

Heart valve replacement is an important heart surgery used to treat life-threatening conditions in patients with heart disease. This operation restores the normal function of the heart by removing the patient's diseased heart and replacing it with a healthy heart from the donor [1-2]. Although this surgery has achieved great success, postoperative care is crucial to the surgical results and the patient's quality of life. Heart replacement surgery is a complex and technically demanding operation. It requires surgeons to have superb surgical skills and rich surgical experience to ensure the success of the operation. During surgery, an extracorporeal circulation machine is needed to maintain the stability of the patient's vital signs and ensure blood oxygenation and circulation. At the same time, the surgical process is complex, and patients may suffer the risk of complications such as surgical trauma, bleeding, and arrhythmia [3-4]. In addition, patients may be at risk of infection and rejection reaction due to the postoperative immunosuppressive therapy. Therefore, before performing heart replacement surgery, doctors usually comprehensively assess the patient's surgical risks and provide full safety care to ensure the safety and effectiveness of the surgery. Past research has shown that reasonable nursing intervention can reduce the occurrence of complications and improve patients' quality of life [5]. However, there is relatively little research on care models for patients

undergoing heart valve replacement, especially the application of seamless care in this field. The seamless nursing model is a comprehensive nursing model that emphasizes continuity and individualized care [6-7]. This model focuses on paying attention to and caring for patients throughout the process to improve nursing effects and patients' quality of life. However, the application of seamless care models in patients after heart valve replacement has not been fully studied [8-9]. This study aims to explore the application value of the seamless nursing model in this field by analyzing the nursing effects and quality of life of patients after heart valve replacement. The study selected 60 heart valve replacement patients who were treated in the cardiovascular surgery department of our hospital from February 2017 to February 2021 as the research subjects, compare the nursing effects and quality of life of different groups of patients, in order to provide guidance for patients with heart valve replacement surgery. Provide important technical support for post-treatment and care.

1 METHODS

1.1 General Information

A total of 60 patients with heart valve replacement surgery who were admitted to the Cardiovascular Surgery Department of our hospital from February 2020 to February 2022 were selected as the research subjects. Case inclusion criteria include: 1) The test group has patients with clear heart valve disease; 2) The test group is between 45 and 75 years old; 3) The test group has surgical indications for heart valve replacement; 4) The test group agrees to participate in this study and signed an informed consent form. Case exclusion criteria include: 1) Patients in the test group who are clinically unable to tolerate surgery; 2) Patients in the test group with severe heart disease or other serious underlying diseases; 3) Patients in the test group with cognitive impairment or mental illness. The specific information of the patients who visited the hospital is shown in Table 1.

Table 1 Basic information of patients who underwent the treatment

Basic information	Test group	Reference group	$t/\chi 2$	P
Age	62.23±4.13	65.23±5.15	1.414	0.267
Male (person）	14	16	1.511	0.264
Female (person)	16	14	1.523	0.289
Wight of the patient (kg)	60.35	62.85	1.158	0.282
Postoperative care duration (Months)	11.5	11.6	1.325	0.325
The affected site is the mitral valve (person)	8	7	1.568	0.358
The affected site is the tricuspid valve (person)	7	7	1.485	0.452
The site of disease is the aorta (person)	15	16	1.356	0.456
Cardiac function NYHA class II (person)	11	10	1.851	0.289
Cardiac function NYHA class III (person)	12	13	1.851	0.289
Cardiac function NYHA class IV (person)	7	7	1.735	0.316

Note: NYHA grade is the New York Heart Function Classification. There are four grades in total. The condition gradually increases from grade I to grade IV.

1.2 Methods

The selected patients were divided into a test group and a reference group according to the random number table method, with 30 cases in each group. The test group adopts a seamless nursing intervention model, including that nursing staff will monitor the patient's health throughout the entire process before and after surgery, understanding the patient's blood sugar, blood lipids, etc., and provide full care. During the operation, nurses should pay attention to the relevant indicators of the ECG monitoring equipment in a timely manner, respond to emergencies during the operation, and cooperate with the doctor to carry out related work. Seamless patient care continues postoperatively until the patient meets discharge requirements. The reference group adopts routine care (the conventional services). There is no full monitoring during the operation. The operation process is the same as that of the test group. Routine care is adopted during the operation and after the operation, including physical examination of the patient according to time. There is no full supervision by nursing staff during the operation.

1.3 Evaluation Standard

The postoperative nursing effects of the two groups of patients will be observed and compared, including changes in scores such as nursing satisfaction, surgical cooperation, psychological state, and patient quality of life. The quality-of-life score was assessed using the Quality-of-Life Questionnaire after Heart Valve Replacement. The higher the total score, the better the quality of patients' life.

1.4 Statistical Method

SPSS statistical software was used for data processing and statistical analysis. Measurement data are expressed as mean ± standard deviation (x±s), and compared using *t* test. Count data were expressed as percentages (%) and compared using the $\chi 2$ test. $P<0.05$ indicates that the difference is statistically significant.

2 RESULTS

2.1 Comparison of the operation effect to two groups

Table 2 shows the comparison of the cooperation between the two groups of patients in heart valve replacement surgery. The on-time rate of surgery can reflect the comprehensive effect of the surgical process. The higher the on-time rate of surgery, the better the efficiency of the surgery. Comparing the two groups of patients, the punctuality rate of the test group is 100%, and the punctuality rate of the control group is 83.33%. The comparison between the two groups of data is statistically significant ($P<0.05$). At the same time, the cooperation rate of the two groups of patients during the operation was compared as well. The higher the cooperation rate, the higher the efficiency of the operation and the smaller the external impact on the operation. The complete cooperation rates of the test and reference groups were 96.66% and 83.33% respectively, and the data comparison between the two groups is statistically significant ($P<0.05$).

Table 2 Comparison of surgical cooperation between the two groups of patients [n (%)]

Group	Test Group	Reference Group	χ^2	*P*
Number of Patients(n)	30	30	-	-
Surgical Punctuality (%)	30(100.00)	27(90.00)	4.455	0.0434
Completely Cooperative (%)	29(96.66)	25(83.33)	-	-
Partially Cooperative (%)	1(3.33)	3(10.00)	-	-
Completely uncooperative (%)	0(0.00)	2(6.00)	-	-
Ratio of been completely cooperative (%)	29(96.66)	25(83.33)	5.265	0.043

At the same time, the surgical procedures of the two groups of patients were compared as below. Table 3 shows the comparison results of the surgical procedures of the two groups of patients. There were significant differences in the surgical time, ICU time, and hospitalization time between the two groups of patients. The operation time of the test group was 129.35 ±3.45min, and that of the reference group is 154.13±4.23min. The operation time of patients in the test group is shorter. At the same time, in the comparison of ICU time and hospitalization time, the test group took shorter time, and the data comparison between the two groups is statistically significant (P<0.05).

Table 3 Comparison of the surgical procedure of the two groups of patients

Group	Test Group	Reference Group	*P*
Number of Patients	30	30	-
Time for heart valve replacement surgery (min)	129. 35 ±3.45	154.13±4.23	<0. 05
ICU Time (d)	2. 87 ± 0. 67	4.13±1. 22	<0. 05
Hospital Time for two groups (d)	11.35±2. 81	15.46±3.37	<0. 05

2.2 Comparison of postoperative body condition analysis between the two groups of patients

The post-operative quality of the two groups of patients is analyzed as shown in Figure 1(control group is the reference group), mainly comparing the quality of the patient's physical recovery, the quality of the patient's wound recovery and the postoperative pain of the patients. Pain is graded from 1 to 10, with the higher the grade, the greater the pain. Judging from the data, the quality of physical health recovery and wound recovery quality of patients in the test group were significantly higher than those in the reference group, and there is no statistical significance between the two groups of data (P>0.05). At the same time, the degree of pain was compared. On the 0th day after the operation, the patient had obvious pain. On the 5th day after the operation, the pain in the test group is greatly reduced. Compared with the data of the reference group, there is statistical significance between the two groups of data (P<0.05).

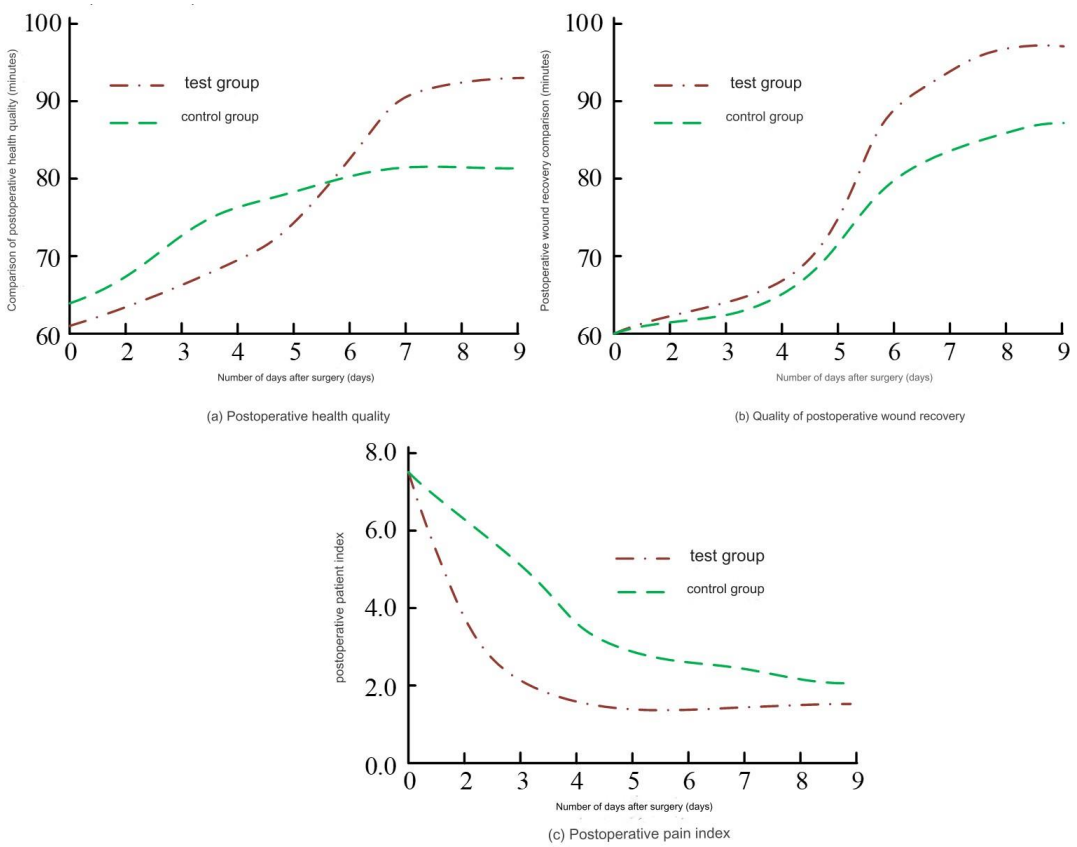

Figure 1 Comparison of postoperative body condition analysis between the two groups of patients

The specific comparison of the postoperative health condition of the two groups of patients is shown in Table 4. As shown in Table 4, before the intervention, the test and reference group data were compared. There is no statistical significance between the two groups of data before the intervention (P>0.05), but there is a statistical significance between the two groups after the intervention (P<0.05).

Table 4 The Health Condition of the Patients (score, x±s)

Group	Number of Patients(n)	Before intervention	After intervention	*P*
Test group	30	68.20±1.67	90.21±2.12	<0.05
Reference group	30	68.28±1.56	74.32±1.12	<0.05
t Value	-	2.3546	1.6.325	-
P Value	-	>0.05	<0.05	-

2.3 Satisfaction analysis of patients

The surgical satisfaction of the two groups of patients was compared, including three levels: very satisfied, satisfied, and dissatisfied. The results are shown in Table 5. As can be seen from the data in Table 5, the satisfaction rate of the test group is 96.66%, and the satisfaction rate of the reference group is 70.00%. The comparison of the data between the two groups is statistically significant (P<0.05). During the actual operation, 9 patients in the reference group were dissatisfied with the operation, accounting for 30%, and 1 patient in the test group was dissatisfied with the operation, accounting for 3.33%. Comprehensive comparison shows that seamless care is more favored by patients and provides better service quality during actual surgeries.

Table 5 Comparison of the surgical satisfaction [n (%)]

Group	Number of patients(n)	Very satisfied	Satisfied	dissatisfied	Satisfaction (%)
Test Group (n)	30	25（83.33）	4（13.33）	1（3.33）	（29）96.66
Reference Group (n)	30	13（43.33）	8（26.66）	9（30.00）	（21）70.00
t	-	-	-	-	10.023
P	-	-	-	-	0.0013

2.4 Analysis of quality of life of two groups of patients

Finally, the quality of life of both groups of patients after surgery is analyzed, including social abilities, emotional functions, mental health, general health, and physiological functions. The higher the score, the better the patient's recovery of this indicator, as more details shown in Table 6. In the comparison of the five major indicators of the quality of life, there is no statistical significance between the data of the two groups of patients before intervention (P>0.05). After the intervention, the scores of the five major indicators quality of life in the test group were all higher than those in the reference group, and the comparison between the patient data of the two groups is statistically significant (P<0.05). In the comparison of social ability, the test group after nursing intervention is 65.35±7.39 and the reference group is 76.65±8.65. There is statistical significance between data of the two groups of (P<0.05). In the mental health comparison, the test group and the reference group are 71.58±7.25 and 63.65±7.47 respectively after nursing intervention. The mental state of the patients in the test group is better. At the same time, the general health of the two groups of patients has been compared as well, including data on the patient's sleep, diet, recovery status, etc. After nursing intervention, the test group is 75.65±3.54 and the reference group is 62.48±7.46. It can be seen that seamless nursing can improve the patient's postoperative recovery effect and is overall better than ordinary nursing.

Table 6 Comparison of quality of life of two groups of patients (score，x±s)

Group	-	Test Group (30)	Reference Group (30)	*t*	*P*
Social Abilities	Before	31.38±3.09	32.42±3.24	0.164	0.668
	After	65.35±7.39	76.65±8.65	7.952	<0.05
	t	54.156	50.657	-	-
	P	<0.05	<0.05	-	-
Emotional Functions	Before	30.37±3.32	31.43±3.56	0.158	0.456
	After	78.35±4.62	64.25±7.13	7.952	<0.05
	t	48.635	45.768	-	-
	P	<0.05	<0.05	-	-
Mental Health	Before	33.34±3.64	32.95±3.31	0.146	0.354
	After	71.58±7.25	63.65±7.47	7.952	<0.05
	t	55.202	53.645	-	-
	P	<0.05	<0.05	-	-
General Health	Before	31.24±3.54	31.95±2.21	0.156	0.364
	After	75.65±3.54	62.48±7.46	7.952	<0.05

	t	45.184	45.25	-	-
	P	<0.05	<0.05	-	--
physiological functions	Before	32.35±3.18	32.42±3.23	0.176	0.454
	After	76.65±7.27	64.68±7.42	7.952	<0.05
	t	52.185	50.732	-	-
	P	<0.05	<0.05	-	

3. DISCUSSION

As one of the common cardiovascular diseases in China, the cause of valvular heart disease is gradually evolving from rheumatic fever to retrogression in the context of the aging of population. The coming challenge is that the number of patients requiring heart valve surgery is also increasing [10-11]. According to statistics, there are approximately 280,000 heart valve operations performed worldwide every year, accounting for 21% to 36% of all cardiac surgeries [12]. This situation is also significant in developed countries such as the United States and Europe. However, the mortality rate of patients undergoing multi-valve surgery or combined coronary artery bypass grafting may be as high as 14.32%, while the mortality rate during the postoperative hospitalization ranges from 3.5% to 7.9% [13-14]. The number of heart valve surgeries performed in China every year is around 90,000, and there is a certain risk of death after surgery. The risk of postoperative death is about 2.3% [15-16]. This type of heart valve disease has many characteristics, such as high incidence, numerous comorbidities, and huge technical difficulty [17]. The risk of postoperative complications and death cannot be underestimated. This not only places a heavy burden on individual patients and families, but also puts great pressure on the medical resources of the entire society

In recent years, with the rapid progress of modern science, the technology of heart valve replacement surgery has become increasingly mature, and its application scope in clinical practice has gradually expanded. This surgery can effectively maintain the normal function of the heart and ensure sufficient power for cardiac circulation. It can not only significantly improve clinical symptoms, but also help improve the quality of life [18]. However, it is worth noting that you may still face the risk of complications such as heart failure and electrolyte imbalance after surgery. Because of this, summarizing past clinical experience and relevant data is crucial to perioperative nursing methods and effects. In the conventional nursing model, nursing services are usually carried out step by step, and the communication between nursing staff, patients and doctors may not be timely and effective enough, which may easily lead to errors and may also reduce the efficiency of surgical work. In contrast, seamless nursing emphasizes cooperation, and nursing staff need to fully communicate with the attending doctor before surgery to gain an in-depth understanding of the patient's condition and nursing needs during the surgery [19]. This close collaboration strengthens connections and ensures proper preparation before surgery. In addition, understanding the surgical habits of the surgeon and taking predictive nursing measures in advance can help to better deal with emergencies that may occur during surgery. At the same time, it is also crucial to provide detailed discharge guidance during the patient's recovery and discharge stage [20]. Whether patients can effectively conduct self-manage after discharge is of great significance to improving quality of life and preventing postoperative complications.

This research applied seamless nursing technology in heart valve replacement

surgery, and compared the differences between traditional nursing and seamless

nursing. In terms of surgical cooperation, the test group's surgery punctuality rate is 100%, while the control group is only 83.33%. This shows that under the seamless nursing model, the communication and collaboration between nursing staff and doctors are closer, which can ensure the smooth progress of the operation and improve the efficiency of the operation. Secondly, in terms of the effect of the surgical process, the operation time, ICU time and hospitalization time of the test group are significantly shorter than those of the control group. This shows that under the seamless nursing model, nursing staff can better assist doctors in surgical operations, reduce surgical time, and effectively control the patient's postoperative recovery time. In addition, in terms of postoperative quality, the postoperative quality score of the test group is significantly higher than that of the control group. This shows that the seamless nursing model can improve patients' postoperative recovery and significantly improve their quality of life. In terms of satisfaction, the test group's satisfaction is 96.66%, while the control group's is 70.00%. This shows that under the seamless nursing model, patients are more satisfied with the surgical results and nursing services, and are more cooperative with nursing staff and doctors. Finally, in terms of quality of life, the scores of social abilities, emotional functions, mental health, general health and physiological functions of the test group are higher than those of the control group. This once again shows that under the seamless care model, patients have better quality of life and can better adapt to postoperative life.

In summary, the application of seamless nursing model in heart valve replacement surgery has obvious advantages, which can improve the efficiency of surgery and the quality of postoperative recovery. The innovation of the seamless nursing model is to strengthen communication and collaboration between nurses and doctors, improve patients' treatment experience, and reduce the occurrence of complications. Therefore, a seamless nursing model makes an important contribution to the successful implementation of heart valve replacement surgery and the patient's postoperative recovery.

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