ASSESSMENT OF SATISFACTION, QUALITY OF LIFE AND SAFETY IN SUBCUTANEOUS PORTS FOR CHEMOTHERAPY ADMINISTRATION AT HUE CENTRAL HOSPITAL

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ABSTRACT

Objective: To survey complications related to subcutaneous ports, evaluate satisfaction and quality of life in cancer patients undergoing chemotherapy via subcutaneous ports at Hue Central Hospital.

Subjects and methods: Cross-sectional descriptive study conducted on 30 chemotherapy-treated patients using subcutaneous ports at Hue Central Hospital from October 2023 to April 2024.

Results: Median age 52.1±14.4, male, female ratio are 20% and 80% respectively. Breast cancer patients accounted for the highest proportion at 43.3%. Only 4 (13.3%) patients experienced complications during the use of subcutaneous ports, with no patients experiencing dislodgement or port removal due to complications. 96.7% of patients were satisfied with subcutaneous port placement. 93.3% of patients would agree to have subcutaneous ports placed again if given the choice. 86.7% of patients were satisfied with the cosmetic aspect after subcutaneous port placement. Physical Component Summary (PCS) and Mental Component Summary (MCS) scores according to the SF-12 tool were 44.9 and 40.8, respectively. The cosmetic result of implantation procedure and the patient's fear of needles entering the injection chamber affect quality of life in terms of mental component summary.

Conclusion: Subcutaneous port placement is beneficial for patients, both reducing events during the process of multiple injections, creating a comfortable feeling for the patient when administering medication as well as in daily living activities, bringing high satisfaction contributing to improve the quality of life.

Keywords: Subcutaneous port; chemotherapy; cancer; satisfaction; quality of life.

1. INTRODUCTION

Cancer is one of the leading causes of mortality worldwide, with the number of new cases increasing annually. According to GLOBOCAN 2020, there are nearly 20 million new cancer cases and over 9.7 million cancer-related deaths globally each year [2]. Advances in early detection, diagnosis, and treatment have contributed to the rising incidence. Among cancer patients, more than 70% require intravenous chemotherapy. Patients frequently experience both psychological and physical distress due to the disease itself and the associated treatments [2]. Conventional treatment approaches-including surgery, radiotherapy, and systemic therapy via peripheral intravenous access-are associated with multiple complications and significantly reduce quality of life. Therefore, the use of central venous

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access devices has become essential to facilitate drug administration, particularly for patients undergoing long-term or frequent treatment within a short period.

In recent years, the widespread use of totally implantable venous access ports (TIVAPs) has provided substantial comfort to patients, particularly in terms of aesthetics and ease of use. In the initial phase, this technique reduces the risk of extravasation, ensures the safe administration of vesicant and irritant drugs, and maintains continuous treatment, especially compared to peripheral venous access. However, in Vietnam, there remains a lack of specific research evaluating patient satisfaction and quality of life following TIVAP implantation. Therefore, we conducted this study with the following objectives:

- To describe the clinical characteristics and assess complications related to totally implantable venous access ports in cancer patients undergoing chemotherapy at Hue Central Hospital.

- To evaluate patient satisfaction and quality of life related to intravenous chemotherapy administration via TIVAPs.

2. SUBJECTS AND METHODS

2.1. Study population

The study included 30 cancer patients undergoing chemotherapy via totally implantable venous access ports (TIVAPs) at Hue Central Hospital from October 2023 to April 2024.

2.1.1. Inclusion criteria

Cancer patients receiving chemotherapy and indicated for TIVAP placement.

2.1.2. Exclusion criteria

Patients who declined participation.

Patients with unstable mental health or those under treatment with antipsychotic medications.

2.2. Study design

A descriptive cross-sectional study.

2.2.1. Study variables and evaluation metrics

Patient characteristics: Age, gender, educational level, occupation, site of primary cancer, and cancer stage.

TIVAP characteristics: Port implantation site, complications during TIVAP use, and reasons for port removal (if any).

Patient satisfaction survey: A standardized questionnaire using a 5-point Likert scale (1 = very satisfied, 2 = satisfied, 3 = moderately satisfied, 4 = slightly satisfied, 5 = not satisfied). Satisfaction rate = scores 1 + 2 + 3; Dissatisfaction rate = scores 4 + 5.

Quality of life assessment: Based on the SF-12 Health Survey, including the Physical Component Summary (PCS) and Mental Component Summary (MCS) scores.

2.2.2. Data Analysis

Data were analyzed using SPSS version 26.0. Multivariate regression analysis was applied to calculate quality of life scores according to the SF-12 instrument.

2.3. Ethical considerations

The indication for TIVAP placement in chemotherapy is approved by the Ministry of Health. All participants provided informed consent after a full explanation of the study objectives and procedures. Collected data were used solely for research purposes, and participants' personal information was kept confidential.

3. RESULTS

3.1. General characteristics of study participants

Table 1. General characteristics of study participants

General Characteristics		Number (n)	Percentage (%)
Mean Age		52,1 ± 14,4 (20-78)	
Gender	Male	6	20,0
	Female	24	80,0
Educational Level	Illiterate	0	0
	Primary school	4	13,3
	Secondary school	11	36,7
	High school or higher	15	50,0
Occupation	Office worker/Retired	7	23,3
	Manual laborer	0	0
	Business/Trade	1	3,3
	Housework/Farming	13	43,3
	Other	9	30,0

Among the 30 patients included in the study, the majority were female (80%). The mean age was 52.1 years. Half of the participants had attained at least a high school education, and none were illiterate. Regarding occupation, the most common group was those engaged in housework or farming (43.3%).

Table 2. Characteristics related to subcutaneous port (Port-a-Cath)

Characteristics		Number (n)	Percentage (%)
Primary Cancer Site	Breast	13	43,3
	Colorectal	2	6,7
	Esophagus/Stomach	3	10,0
	Malignant Lymphoma	4	13,3
	Other	8	26,7
Disease Stage	I	7	23,3
	II	5	16,7
	III	6	20
	IV	12	40
Port Insertion Site	Left internal jugular vein	2	6,7
	Right internal jugular vein	28	93,3

Characteristics		Number (n)	Percentage (%)
Reason for Port Removal	Completion of treatment	6	20
	Not removed	22	73,3
	Due to port-related complications	2	6,7

In our study, breast cancer was the most common indication for subcutaneous port placement, accounting for 43.3% of cases, followed by malignant lymphoma at 13.3%. A majority of patients (60%) were in advanced stages (Stage III–IV) at the time of port placement. The right internal jugular vein was the predominant site for port insertion, used in 93.3% of cases. By the end of the study, 8 patients (26.7%) had their ports removed, of which 2 cases (6.7%) were due to port-related complications, specifically port occlusion.

Table 3. Complications during the use of subcutaneous port

Complication	Number (n)	Percentage (%)
Port-related infection	0	0
Skin erythema/ulceration	0	0
Catheter occlusion	3	10
Pneumothorax	0	0
Subcutaneous hemorrhage	0	0
Catheter displacement/malposition	0	0
Catheter fracture/breakage	0	0
Pain at port site	1	3,3
No complications	26	86,7

No serious complications were observed during the use of the subcutaneous port (Port-a-Cath). At the end of the study, complications were recorded in only 4 patients (13.3%). Among them, 3 patients (10%) experienced catheter occlusion and 1 patient (3.3%) reported pain at the port insertion site.

3.2. Patient satisfaction and quality of life with subcutaneous port implantation

Table 4. Patient satisfaction with the use of subcutaneous port (Port-a-Cath)

Assessment questions	Patient satisfaction summary				
	Very satisfied n (%)	Satisfied n (%)	Moderate n (%)	Dissatisfied n (%)	Not at all n (%)
Overall, are you satisfied with the subcutaneous port (Port-a-Cath)?	18 (60)	8 (26,7)	3 (10,0)	1 (3,3)	0

Assessment questions	Patient satisfaction summary				
	Very satisfied n (%)	Satisfied n (%)	Moderate n (%)	Dissatisfied n (%)	Not at all n (%)
If given the choice again, would you opt to have a port inserted?	13 (43,3)	15 (50,0)	0	2 (6,7)	0
Are you afraid of possible port complications?	0	1 (3,3)	4 (13,3)	5 (16,7)	20 (66,7)
Do you frequently worry about the port?	0	1 (3,3)	3 (10,0)	10 (33,3)	16 (53,4)
Do you feel the port is a foreign object that causes discomfort?	0	1 (3,3)	2 (6,7)	8 (26,7)	19 (63,3)
Are you satisfied with the cosmetic appearance after port placement?	9 (30,0)	14 (46,7)	3 (10,0)	1 (3,3)	3 (10,0)
Were you thoroughly informed about the port procedure?	20 (66,7)	8 (26,7)	2 (6,6)	0	0
Did you experience pain during the procedure?	1 (3,3)	0	5 (16,7)	6 (20,0)	18 (60,0)
Do you currently experience any pain at the port site?	0	1 (3,3)	0	10 (33,3)	19 (63,4)
Are you afraid of needle insertion into the port?	0	0	4 (13,3)	6 (20,0)	20 (66,7)
Do you think the port makes chemotherapy infusion easier?	15 (50,0)	14 (46,7)	1 (3,3)	0	0
Do you feel more comfortable during chemotherapy when using the port?	20 (66,7)	8 (26,7)	2 (6,7)	0	0
Does the port interfere with your daily activities?	0	1 (3,3)	0	9 (30,0)	20 (66,7)
Are you able to rest well with the port in place?	12 (40,0)	11 (36,7)	3 (10,0)	1 (3,3)	3 (10,0)
Would you recommend port insertion to other patients undergoing chemotherapy?	16 (53,3)	12 (40)	2 (6,7)	0	0

The study showed that 96.7% of patients were satisfied with subcutaneous port (Port-a-Cath) placement. All participants (100%) were well-informed about the procedure prior to implantation. A total of 93.3% felt more comfortable receiving chemotherapy through the port, and daily activities were not hindered for the majority of patients (66.7%). In terms of cosmetic concerns, 86.7% expressed satis-

faction with the aesthetic outcome. Notably, only 2 patients (6.7%) had minor reservations about opting for the port again, and the vast majority showed little to no anxiety regarding potential complications. However, 10% of patients perceived the port as a foreign object. Overall, patient perception of the subcutaneous port was highly favorable in terms of comfort, ease of chemotherapy administration, and impact on quality of life.

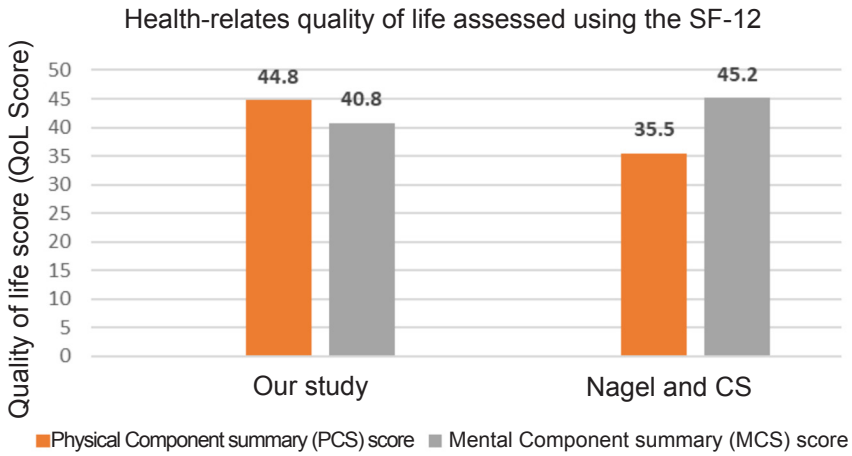

Figure. Quality of life scores among cancer patients with subcutaneous port use assessed by SF-12

In our study, quality of life among cancer patients using a subcutaneous port (Port-a-Cath) was assessed using the 12-Item Short Form Survey (SF-12). The results showed a median Physical Component Summary (PCS) score of 44.8 and a median Mental Component Summary (MCS) score of 35.5.

Table 5. Multivariate regression analysis based on mental health scores

	Mental component score (SF-12 MCS)		
	Beta (SE)	**T**	**P**
Satisfaction with subcutaneous port	0,149	0,845	0,406
Complications of the port	0,043	0,246	0,163
Fear of port-related complications	0,232	1,156	0,258
Frequent worries about the port	-0,149	-1.112	0,276
Fear of needle insertion into the port	-0,443	-2,826	0,009
Perception of the port as a foreign object	-0,169	-1,064	0,297
Satisfaction with the aesthetics of the port	0,332	2,118	0,044
Pain from the port	0,149	0,845	0,406
Impact on daily activities	0,149	0,845	0,406

The multivariate regression analysis showed that the aesthetic aspect of the subcutaneous port and the patient's fear of needle insertion significantly affected mental health-related quality of life, with statistically significant p-values of 0.044 and 0.009, respectively.

4. DISCUSSION

4.1. General characteristics of study participants

The mean age in our study was 52.1 ± 14.4 years (ranging from 20 to 78), which is lower than some previous studies. For instance, Le Van Long (2023) reported a mean age of 59[5], while Nagel et al. reported a mean age of 60.6 years for port placements[3]. In our study, females accounted for 80% of participants. This gender distribution differs from several other reports. Kumar et al[4], found that male patients predominated in port placements, whereas Nagel et al. reported 60.2% of patients were female[3]. The gender disparity in our study may be attributed to a high proportion of breast cancer cases. Notably, no illiterate patients were recorded in our sample. The majority of patients were female, likely due to concerns about aesthetics and the desire to avoid skin damage caused by repeated peripheral vein infusions during chemotherapy.

4.2. Characteristics and complications related to subcutaneous ports

Among the 30 patients included in our study, those with breast cancer comprised the largest proportion of port placements at 43.3%, followed by lymphoma at 13.3%. This aligns with several other studies-for instance, Irappa Madabhavi et al. reported breast cancer cases made up 38.4% of their cohort[5]. According to Nagel et al., breast and gastrointestinal cancers each accounted for 23.5% of cases[3]. The right internal jugular vein was the preferred site for port placement in 93.3% of patients, consistent with many international reports. Two cases involved placement in the left internal jugular vein due to difficulty accessing the right side (e.g., right-sided mastectomy in prior surgeries). In our study, 12 out of 30 patients (40%) were in stage IV, comparable to the 47% reported by David et al[6].

During port usage, 4 patients (13.3%) experienced complications: 3 with port occlusion (10%) and 1 with pain at the insertion site. These rates differ from some published data. Irappa Madabhavi et al. reported a 12% infection rate, 2% catheter migration, 2% port fracture, and 1% with recurrent pleural effusion due to catheter tip placement in the pleural space. They also observed 1% with thrombosis[5]. Le Van Long (2023) recorded 4.8% infections, 3.2% catheter occlusions, and 1.6% venous thrombosis [5]. Among 483 patients in a study by Eric Voog et al., there were 7.6% infections, 3.6% thrombosis, and 1.9% extravasation, with 71.3% of complications occurring within the first year of use [7]. Another study by Nilgün Yıldırım reported complications in 54 out of 260 patients, with port occlusion being the most common at 8.4% [8]. The lower complication rate in our study may be due to the limited sample size. Nonetheless, our findings suggest that subcutaneous ports are safe for intravenous chemotherapy administration.

4.3. Patient satisfaction and quality of life with subcutaneous ports

Overall, 96.7% of patients expressed satisfaction with port placement, with 60% selecting "very much" 26.7% "much" and 10% "moderate". Additionally, 93.3% of patients indicated they would choose to have a port again. All patients were informed about the procedure beforehand, and all felt comfortable receiving chemotherapy through the port. Daily activities were not hindered, with 66.7% choosing "very much" when asked about comfort with the port. Regarding pain, 20% experienced "a little", while 60% reported "none". Only 2 patients expressed hesitation about having the port again. The majority did not worry about potential complications, and only 3 patients (10%)

perceived the port as a foreign object. Aesthetic satisfaction was high, with 86.7% satisfied with the appearance post-placement.

These findings are consistent with both domestic and international studies. Le Van Long (2023) reported that 98.4% of patients were satisfied or very satisfied with their port use [5]. In Nagel et al.'s (2012) study, 85.7% of patients reported being "very" or "quite" satisfied, and 90.5% would opt to have a port again. Moreover, 88.1% reported little or no pain from the port, and 71.4% said they could enjoy leisure time during treatment [3]. Nilgün Yıldırım et al. reported that 59.6% of patients experienced "little" or "no" pain, and only 6 patients reported significant pain. Meanwhile, 87.1% did not feel discomfort or pain during treatment, and just 3.8% said the port affected daily life [8]. While subcutaneous ports provide high satisfaction, a small number of patients remain dissatisfied, highlighting the need for better patient education before port placement and improvements in port aesthetics post-placement.

Using the SF-12 quality of life tool (12 questions), the median physical and mental health scores in our study were 44.8 and 35.5, respectively lower than the general population, but similar to results from Nagel et al[3]. Our multivariate regression analysis showed that port aesthetics and fear of needle insertion significantly influenced mental health scores, with statistically significant p-values of 0.044 and 0.009. These findings emphasize that improving port aesthetics and patient education, along with reducing psychological distress, can enhance the quality of life for patients using subcutaneous ports.

5. CONCLUSION

Subcutaneous port implantation ensures safety with a low rate of complications during infusion procedures. It provides comfort for patients both during chemotherapy administration and in daily life activities. Most patients expressed satisfaction with the use of subcutaneous ports, which contributed positively to their overall quality of life during chemotherapy treatment. The results highlight the importance of considering the aesthetic aspect of the port, as it is significantly associated with patients' quality of life.

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