Survey-Based Evaluation of Cancer Patients' Satisfaction and Discomfort Experienced During Central Venous Port Use

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ABSTRACT

Introduction: The use of central venous port provides a safer and better quality of life for cancer patients undergoing chemotherapy. Refusal of central venous port implantation in patients with inadequate venous access may lead to discontinuation of chemotherapy or even extravasation of peripheral vasculitis and anti-cancer drugs. By doing this survey-based study, it was aimed to determine the reasons before the implantation of central venous port systems, the patient's satisfaction afterwards, the complications associated with the port system, the discomfort they cause and the expectations of the patients.

Patients and Methods: The study was carried out based on a questionnaire and through one-to-one interview by a cardiovascular surgeon with 100 patients who were treated with central venous port in the chemotherapy unit of Eskişehir City Hospital between August 1 and October 31, 2022.

Results: Sixty-one percent of the patients cited long-term intravenous therapy and 44% cited inadequate venous access as the cause of port implantation. Ninety-six percent of the participants stated that they were satisfied with their ports. Only six patients stated that they had various problems, but were satisfied overall. When asked about the advantages of using the port, 76% of the patients stated that they no longer had more than one vascular puncture problem and 75% stated that they felt less pain. Fifty-one percent of the patients stated that they felt anxiety before the procedure; the most felt concern was possible complications (13 patients) and the thought that it would cause discomfort in life. Nine patients experienced complications after port implantation. Five patients described port system obstruction and four patients described the development of skin infection.

Conclusion: Especially in our country, most patients still do not use central venous ports. The fact that existing fears and anxiety of the patients before the procedure cannot be eliminated with adequate and correct information plays an important role in this. At this point, the operator who performs the surgical procedure in the center where the procedure is performed should inform the patient and the oncology and chemotherapy nurse who give first information to the patient.

Key Words: Chemotherapy, central venous catheter, port catheter

Kanser Hastalarının Santral Venöz Port Kullanımı Sırasında Yaşadıkları Memnuniyet ve Rahatsızlığın Ankete Dayalı Değerlendirmesi

ÖZET

Giriş: Santral venöz port kullanımı, kemoterapi gören kanser hastalarında daha güvenli ve kaliteli bir yaşam olanağı sunmaktadır. Yetersiz venöz erişim sorunu olan hastalarda santral venöz port implantasyonunun reddedilmesi, kemoterapinin kesilmesine hatta periferik vaskülit ve anti-kanser ilaçların ekstravazasyonuna yol açabilir. Ankete dayalı bu çalışmayı yaparak; santral venöz port sistemlerinin implantasyonundan önce nedenleri, sonrasında hastanın memnuniyeti, port sistemi ile ilişkili komplikasyonlar, neden oldukları rahatsızlık ve hastaların beklentilerini tespit etmeyi amaçladık.

Hastalar ve Yöntem: 1 Ağustos ve 31 Ekim 2022 tarihleri arasında Eskişehir Şehir Hastanesi Kemoterapi Ünitesinde tedavisini santral venöz port ile alan 100 hasta ile bir kalp ve damar cerrahisi uzmanı tarafından bire bir görüşme yoluyla, ankete dayalı olarak gerçekleştirildi.

Bulgular: Hastaların %61'i port implantasyon sebebi olarak uzun süreli intravenöz tedaviyi, 44'ü yetersiz venöz erişimi gösterdi. Ankete katılanların %96'sı portundan memnun olduğunu söyledi. Yalnız altı hasta çeşitli problemler yaşadığını fakat yine de memnun olduğunu belirtti. Port kullanımının avantajları sorulduğunda hastaların %76'sı artık birden fazla damar delinme sorunu yaşamadığını, %75'i daha az ağrı hissettiğini belirtti. Hastaların %51'i işlem öncesi endişe hissettiğini belirtti; en çok hissedilen endişe gelişebilecek komplikasyonlar (13 hasta) ve günlük hayatta rahatsızlık vereceği düşüncesiydi. Port implantasyonu sonrası dokuz hasta komplikasyon yaşamıştı. Beş hasta port sistemi tıkanıklığı, dört hasta da ciltte enfeksiyon gelişimi tarifledi.

Sonuç: Özellikle ülkemizde halen hastaların büyük bir bölümü santral venöz port kullanmamaktadır. Bunda hastaların işlem öncesi mevcut korku ve anksiyetelerinin, yeterli ve doğru bilgilendirme ile giderilememesi önemli bir rol oynamaktadır. Bu noktada özellikle işlemin yapıldığı merkezde cerrahi prosedürü uygulayan operatörün hastayı ve hastaya ilk bilgiyi veren onkoloji ve kemoterapi hemşiresini çok iyi bilgilendirmesi gerekmektedir.

Anahtar Kelimeler: Kemoterapi, santral venöz kateter, port kateter

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INTRODUCTION

In recent years, the use of central venous port (CV port) systems has increased rapidly due to their convenience and safety in patients requiring long-term continuous intravenous therapy and in patients with difficult venous access[1]. The use of CV port offers a safer and better quality of life for patients with cancer undergoing chemotherapy. Providing continuous, reliable intravenous catheterization has given clinicians the opportunity to apply more complex and more effective treatment regimens. On the other hand, it has created the opportunity for outpatient treatment and shortened hospital stay[2]. An advanced medical center in Japan states that patients refuse to have CV ports implanted for various reasons, such as fear of complications or avoidance of implanted artificial devices[3]. Refusal of CV port implantation in patients with inadequate venous access may lead to discontinuation of chemotherapy or even peripheral vasculitis and extravasation of anti-cancer drugs.

We found that some of the patients who were requested to have CV port implantation for various clinical reasons in our hospital hesitated to approve the procedure, some did not accept due to their fears, but after port implantation, these patients gave feedback with great satisfaction and saw that the CV port could be used for many different purposes. Therefore, by doing this survey-based study, we aimed to determine the reasons before the implantation of CV port systems, the patient's satisfaction afterwards, the complications associated with the port system, the discomfort they caused, and the expectations of the patients.

PATIENTS and METHODS

Subjects and procedures

This study was carried out between August 1, 2022 and 31 October 1, 2022 in Eskişehir City Hospital Cardiovascular Surgery Outpatient Clinic and Chemotherapy Unit. All patients who received chemotherapy with the CV port system during this period were included in the study. The questionnaire was personally conducted by a cardiothoracic surgeon in the cardiovascular surgery outpatient clinic and chemotherapy unit. Written consent form was obtained from all participants before starting the survey.

Surgical Procedure

All patients with CV port implanted by us were operated with the same surgical technique by a single operator. Surgical procedure was performed under local anesthesia with Doppler ultrasonography and scopy support in the angiography unit or operating room conditions. The jugular vein was preferred as venous access. The patient was followed up in service conditions for at least four hours after the procedure and was discharged after having seen control chest X-ray and heart teleradiogram. Routine antibiotic prophylaxis before the operation and maintenance antibiotic therapy were not applied afterwards.

Questionnaire

The questionnaire was developed by the researchers by utilizing similar studies and arranged according to the socioeconomic and literacy level of the patient group (Table 1)[4]. Sex, age group, number of port implantation procedures the patient underwent, the environment where the port was implanted (inpatient or outpatient), reasons for port implantation, patient's satisfaction with the CV port, discomfort, patient's opinion of the advantages of the CV port, any concerns the patient had prior to port implantation, and the patient's expectations about the CV port were questioned.

Statistical Analysis

All statistical analyzes were performed using "IBM SPSS Statistics version 23". Descriptive statistics were used to characterize the patient population. In all analyses, $p< 0.05$ was considered significant.

RESULTS

As planned before, 100 patients who had been admitted to the chemotherapy unit and cardiovascular surgery outpatient clinic of our hospital and had agreed to participate in the survey were included in the study. Table 2 shows patient characteristics. Sixty-five of the patients were males and 35 were females. Vast majority of the patients were in the 40/59 age group (44 patients). When asked about the reason for CV port implantation, 61 of the patients stated their reason for preference as long-term intravenous therapy and 44 patients as poor venous access (they were allowed to choose more than one reason) (Table 2). Four of our patients stated that they had a second port implantation procedure. While an interventional radiologist performed the CV port implantation operation in five of the patients, this procedure was performed by a cardiovascular surgeon in 95 patients. While 90 patients' surgeries were performed in our hospital, 10 patients stated that their CV port was implanted in another center. In addition, 54 and 46 patients had CV ports implanted as inpatients and outpatients, respectively.

Of the patients, 96% stated that they were satisfied with their port, while six patients stated that they were partially satisfied but had some problems. No patient regretted port implantation. The patient, who was less satisfied than the others, stated that he had problems because an infection had developed at the surgical incision site. Patients were asked to indicate their satisfaction level on a scale of 0-100%. The sat-

Table 1. Questionnaire applied to the patients in the study.

Please answer the following questions to assist our clinical investigation of the use of central venous ports for chemotherapy.

1. How long ago your central venous port was inserted?
   1) <1 month 2) 1-3 months 3) 3-6 months 4) >6 months

2. Was your santal venous port inserted in our hospital?
   1) Yes 2) No

3. Who inserted your port?
   1) Cardiovascular surgeon 2) Radiologist 3) Other

4. a. What is your gender? b. What age group do you belong to? c. How many times have ports been implanted in your body?
   a. 1) Male, 2) Female
   b. 1) <20 years, 2) 20-39, 3) 40-59, 4) 60-79, 5) >80
   c. 1) Once, 2) Two times, 3) Three or more times

5. When your port was implanted, were you an inpatient or an outpatient?
   1) Inpatient, 2) Outpatient

6. Why was your port implanted?
   A) It made it difficult for me to get intravenous infusions as my veins were thin and weak.
   B) Because I needed long-term continuous intravenous therapy.
   C) Other reasons

7. How satisfied are you with the port system in general?
   1) I am very happy with the port system and wish it was implamented earlier
   2) I am satisfied with the CV port system.
   3) I am somewhat satisfied with the CV port system, but have had some discomfort.
   4) I regret that the CV port system was implanted.

8. If you chose option 3) or 4) for Question 7, please describe the discomfort you are experiencing.
   (...)

9. If full satisfaction is defined as 100% and complete dissatisfaction as 0%, how satisfied are you with the port system?
   (...%)

10. Please choose the advantages of the ports that suit you (you can choose more than one answer).
    1) I no longer have to go through multiple venipuncture procedures.
    2) I feel less pain when the procedures are done through my port rather than my peripheral veins.
    3) I do not have to adjust the position of my arms during intravenous injections.
    4) The port does not bother me much in my daily life.
    5) Other reasons (...)

11. Did you have any concerns before the port system was implanted?
    1) I didn't feel any anxiety.
    2) I felt some anxiety.

12. If you chose option 2) for Question 11, what is the source of your concern? (you can choose more than one answer)

    1) There was no obvious reason, but I felt a vague sense of anxiety.
    2) I received insufficient information about the port system from the health personnel.
    3) I was afraid of complications.
       (Please explain what kind of complications you are afraid of: ...)
    4) Admission to the hospital for port implantation was not suitable for me.
    5) I was afraid of cosmetic deformities.
    6) I was afraid that the port might disturb me in my daily life.
    7) I would not trust medical personnel.
    8) The idea of having an artificial device in my body bothered me.
    9) Other types of anxiety (...)

13. Have you had any complications with the port system?
    1) Port system obstruction, 2) Infection, 3) Twisting or opening of the skin 4) Other complications (...)

isfaction levels of patients who underwent port implantation due to poor venous access, need for long-term intravenous treatment and other reasons were 96.7%, 95.4% and 95%, respectively, and there was no significant difference in terms of the satisfaction levels between patient groups (Table 3).

When answers regarding the advantages of CV port usage were evaluated, 76 of the patients stated that they no longer had multiple venipuncture procedures and 75 stated that they felt less pain (Table 4).

Table 2. Patients' characteristics

		n (%)
Sex	**Female/Male**	**35/65**
Age	20-39/40-59/60-79	13/44/43
Reason of implantation	Poor venous access/longterm IV therapy	44/61
Implantation setting	Inpatient/outpatient	54/46

Table 3. Satisfaction score

Reason	Number	Mean %	SD	p
Poor venous access	44	96.7	2.6	0.41
Longterm cont. IV therapy*	61	95.4	4.1	

*longterm continuous intravenous therapy,
p values were calculated using Student's t-test.

Table 4. Advantages of using a central venous port

1.	Multiple venipuncture procedures are no longer required	76
2.	Patients describe less pain sensation.	75
3.	Patients do not have to adjust the positions of their arms during intravenous injections	57
4.	In my daily life, the CV port does not cause much discomfort.	64

When the patients were asked if they had any concerns before the procedure, 51 stated that they felt anxiety (Table 5). The most felt concerns were complications that might develop during the procedure (13 patients) and that the port would cause discomfort in their daily lives (13 patients).

Nine patients answered "yes" to the question "Did you experience any complications after CV port implantation?". Four of these patients stated that the port system was blocked, and five of them stated that they developed a skin infection. In four of the patients, infection developed in the occlusion and incision line in the CV port systems, and infection developed in the incision line only in three patients. In two of our patients, due to the leakage of the chemotherapy drug under the skin, infection and opening at the incision site developed, and wound revision was required.

DISCUSSION

Recently, the use of CV ports has increased, especially in Western countries. However, this rate is not yet at the desired level in our country. In a New York-based study conducted by Snyderman et al. on 18.000 patients, the rate of CV port usage varies between 24-56% according to cancer types[5], and this rate has been found to be 15% in an India-based study by Madabhabi et al[6]. Robinson's meta-analysis published in 2018 showed that patients with cancer preferred more CV ports as socio-economic level and literacy rate increased[7]. In our

Table 5. The source of anxiety felt before the procedure

Source	n
Vague anxiety with no clear cause	35
Insufficient information about the CV port	10
Possibility of complications	13
Cosmetic deformities	5
Disturbances to daily life	13
Aversion to the implantation of artificial devices	5

Table 6. Comparison of "PORT" study results with international studies

Character	Madabhavi et al. (%)	Vardy et al. (%)	Present study (%)
No. of cases	100	110	91
Antibiotic prophylaxis	100	NA	NA
Infection	8	4	9.8
Catheter fracture	2	2	NA
Catheter displacement	2	NA	NA
Thrombosis	1	2	4.3

center, 208 (17.3%) of 1200 patients who received chemotherapy between February 1 and June 1 received their treatment with a CV port. In the study conducted by Yesilbalkan et al. on patients in our country, it has been shown that patients do not prefer CV port because they do not have sufficient information before the procedure[8].

In our study, before port implantation, vague anxiety with no clear cause (35%) was the most common type of anxiety, which was followed by the possibility of complications (13%) and the fear of discomfort in daily life (13%). After port implantation, 96% of patients stated that they were satisfied with their port. This rate was higher than similar studies conducted in Europe[9,10].

Considering the satisfaction rates according to port implantation preference reasons, the highest satisfaction rate was in the patient group with poor venous access. However, there was no statistically significant difference between the groups. Based on this, we can say that port implantation should be preferred in the early period in elderly patients, obese patients and patients with peripheral vascular access problems.

CV port implantation was performed in 91 of the patients included in the study by a cardiovascular surgeon in our hospital, and the procedure was performed in nine patients by an interventional radiology specialist in another center. Ninety-one patients who underwent port implantation procedure in our hospital were compared with two international studies according to the character of the complications (Table 6)[6,11]. While catheter malposition and breakage were never seen in our patient group, our rates of catheter thrombosis and incision site infection were higher than in those studies. Due to our results, it was decided to provide training on port catheter care and cleaning the port correctly in the same way by all nurses after the treatment session. Since our preference for antibiotic prophylaxis was thought to be a factor in our higher infection rate, it was decided to start routine prophylaxis in each patient after our study.

In the interviews we made for this study, we found that the patients who decided to have CV port implantation were evaluated and informed by the oncology clinic and our physicians and that the patients were most worried and afraid about the surgical procedure. In the light of these data, we made some more satisfactory arrangements about giving preoperative information with our physicians in the oncology unit and nurses in the chemotherapy unit.

When we evaluated the opinions of the patients regarding the advantages of their ports, the most commonly reported advantages were that they did not need more than one venipuncture, they felt less pain, and they did not feel discomfort in their daily lives, respectively. In a similar study by Yagi et al., the most common advantage reported was not having to adjust the positions of the arms during intravenous injection[12].

There were a number of limitations to this study. First, our study sample size was insufficient to derive a common opinion on CV port systems among Turkish patients with cancer. The study was conducted only in our hospital and not all patients who received their chemotherapy via the port system agreed to participate in the survey. Since the survey was conducted with one-on-one interviews, it could be thought that patients with high satisfaction were more motivated to accept to participate in the survey. Finally, while creating our survey, we used the English version of a study originally written in Japanese. This might have caused semantic and expression problems during translations.

CONCLUSION

The vast majority of patients who received chemotherapy treatment through the CV port system were satisfied with this situation. They stated that their quality of life increased compared to the period in which peripheral vascular access was used. However, especially in our country, most of the patients still do not use CV ports. The fact that the existing fears and anxiety of the patients before the procedure cannot be elimi-

nated with adequate and correct information plays an important role in this. At this point, the operator (vascular surgeon, interventional radiologist, etc.) who performs the surgical procedure in the center where the procedure is performed should inform the patient and the nurses in the oncology and chemotherapy units who give the first information to the patient. Correct maintenance of the port system and training of the personnel on infection prophylaxis are very important after the procedure.

Ethics Committee Approval: The study was approved by Kartal Koşuyolu High Specialization Training and Research Hospital Non-Invasive Clinical Research Ethics Committee (Decision no: 2022/12/624, Date: 23.08.2022).

Informed Consent: Informed consent was obtained from all patients included in the exercise.

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