UDK 616.14-089.819.1-056.24
COBISS.SR-ID 38761993

IMPLANTACIJA PORT-A-CATH VASKULARNOG KATETERA – ISKUSTVA IZ PRAKSE I UTICAJ NA KVALITET ŽIVOTA

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Sažetak: Centralni venski kateteri (CVK) imaju veoma važnu ulogu u lečenju pacijenata sa malignim oboljenjima. CVK se koriste za primenu hemioterapije, a takođe i za produženu upotrebu tečnosti, krvi i krvnih derivata, antibiotika, parenteralne ishrane, kao i za često uzorkovanje laboratorijskih rezultata. Port-a-cath venski kateteri su zatvoreni sistemi i njihova funkcija je da omoguće pristup centralnom vaskularnom sistemu. Upotreba ovih sistema povezana je sa smanjenom mogućnošću infekcije, jednostavnim održavanjem porta koji se ne koristi, estetskom dobiti i poboljšanom pokretljivošću pacijenata. U našoj ustanovi je ugrađeno 16 port-a-cath vaskularnih katetera kod onkoloških pacijenata od januara 2017. do 31. januara 2018. Nije bilo ranih komplikacija, a kod 12,5% pacijenata su se javile kasne komplikacije. Subjektivnom procenom svih pacijenata sa ugrađenim port-a-cath sistemom je utvrđeno poboljšanje kvaliteta života.

Ključne reči: port-a-cath, onkološki pacijenti, kvalitet života, hemioterapija

UVOD

Pacijentima sa malignim oboljenjima je neophodan multidisciplinarni pristup i terapija koja se često daje intravenski. Centralni venski kateteri (CVK) imaju veoma važnu ulogu u izlečenju ovih pacijenata. Oni se ne koriste samo u primeni hemioterapije (hemoterapije), već i za produženu upotrebu tečnosti, krvi i krvnih derivata, antibiotika, parenteralne ishrane (TPI), kao i za često uzorkovanje laboratorijskih rezultata. Postoje različite vrste CVK-a: netunelirani CVK, periferno insertovani PICC, tunelirani i CVK sa implantabilnim portom. Za onkološke pacijente najprikladniji su CVK sa implantabilnim portom zbog relativno jednostavne implantacije i upotrebe, niske stope infekcije, sigurnosti i udobnosti koju pružaju pacijentima [1,2,3,4]. U savremenoj onkologiji ovi sistemi zamenjuju tunelirane katetere i katetere za kratkotrajnu upotrebu. Hemioterapija se prima ciklično da bi se izbegla ponovna upotreba CVK-a koji dovodi do skleroze zida krvnih sudova. Kako svaki invazivni postupak nosi svoje rizike (infekcija, hematoma, pneumotoraks i dr.), postoji mogućnost primene port-a-cath katetera koji poboljšava kvalitet života pacijentima na dugoročnoj terapiji [5].

OPIS PROCEDURE: PLASIRANJE PORT-A-CATH

Port-a-cath se sastoji od katetera i komore koja se, osim za davanje citostatika, antibiotika i lekova protiv bolova, takođe koristi i za parentelarnu ishranu ili za uzorkovanje krvi. Port se plasira subkutano, uglavnom na prednjoj strani grudnog koša i vezuje za kateter postavljen u gornjoj šupljoj veni iznad ušća u desnu pretkomoru. Port-a-cath može ostati tako plasiran nekoliko meseci. Da bi put za davanje terapije ili uzorkovanje krvi bio pristupačan, posebna šuplja igla (Huber igla) se ubacuje kroz kožu u silikonsku membranu porta, dok je komora imobilisana prstima nedominantne ruke. Punkcija porta se uvek radi u sterilnim uslovima, primenom aseptične tehnike na koži uz upotrebu sterilnih rukavica da bi se sprečila infekcija [1]. Preporučuje se ispiranje otvora rastvorom heparina u koncentraciji 10-100ij / ml nakon svake upotrebe [6].

Procedura plasiranja port-a-cath katetera može se obaviti na sledeće načine: hirurškom tehnikom pripreme krvnog suda, tehnikom direktne punkcije vene uz pomoć ultrazvuka. Prednost direktne punkcije vene je mogućnost izvođenja procedure u lokalnoj anesteziji. Hirurško plasiranje porta se vrši u opštoj ili regionalnoj anesteziji. Potencijalna mesta za umetanje CVK-a su cefalična i bazilična

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Rad primljen: 8.11.2020. Elektronska verzija objavljena: 28.05.2021.

IMPLANTATION OF THE PORT-A-CATH WITH ONCOLOGIC PATIENTS - USAGE AND INFLUENCE ON THE QUALITY OF LIFE

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Abstract: Central vein catheters (CVC) have very important role in the treatment of patients with malignant diseases. CVCs are used for the application of chemotherapy and also for the extended usage of liquids, blood and blood derivatives, antibiotics, total parental nutrition as well as for common blood analysis. Port-a-cath vein catheters are closed systems and their purpose is to provide access to the central vascular system. The use of these systems is associated with decreased possibility of infection, simple maintenance of the port that is not in use, esthetic benefit and improved mobility of patients. In our clinic 16 port-a-cath vascular catheters were implanted to oncologic patients from January 2017 until 31st January 2018. There were no early complications and in 12,5% of patients late complications occurred. Subjective assessment of all the patients with implanted port-a-cath system is improved quality of life.

Key words: port-a-cath, oncologic patients, quality of life, chemotherapy

INTRODUCTION

Patients with malignant diseases need multidisciplinary approach and therapy that is often given intravenously. Central vein catheters (CVC) have very important role in the cure of these patients. They are used not only in the application of chemotherapy but also for the extended usage of liquids, blood and blood derivatives, antibiotics, total parental nutrition as well as for common blood analysis. There are different types of CVC: non-tunneled CVC, peripheral inserted PICC, tunneled and CVC with implantable port. For oncological patients the most adequate is CVC with implantable port due to relatively simple implantation and uses, low infection levels, safety and comfort that provides to patients [1,2,3,4]. In modern oncology these systems replace the tunneled catheters and short-term use. Chemotherapy is taken cyclically and to avoid reuse of CVC that leads to sclerosis of the blood vessel wall and as every invasive procedure takes its risks (infection, hematoma, pneumothorax...), there is a possibility of implementation port-a-cath catheter that improves lives to patients on long termed therapies [5].

PROCEDURE DESCRIPTION: PORT-A-CATH PLACEMENT

Port-a-cath is composed of the catheter and the chamber that is apart from the cytostatic

treatment, antibiotics and painkillers also used for parental nutrition or for the blood sampling. The port is placed subcutaneously, mostly on the front of the chest, connected with the catheter positioned in superior vena cava above the confluence in right atrium.

Port-a-cath can stay placed for several months. To enable the route for therapy taking or blood sampling the special hollow needle (Huber needle) is implemented through the skin in silicon membrane of the port whilst the chamber is immobilized with fingers of non dominant hand. The port puncture is always done in sterile conditions with application of aseptic technique on the skin with usage of sterile gloves to prevent infection [1]. It is recommended to rinse the port after each usage with heparin solution in concentration of 10-100 iu/ml. [6]

The procedure of port-a-cath catheter placement can be done in following ways: by surgery technique of the preparation of blood vessel, by the technique of direct vein puncture lead by ultrasound. The advantage of direct vein puncture is the possibility of performing the procedure in local anesthesia. Surgery placement of the port is to be done in the general or regional anesthesia. The potential places for insertion of CVC are cephalic and basilic vein, subclavian vein, vein jugular intern on the neck or vein jugular extern that can be used as the

vena, subklavijska vena, interna jugularna vena na vratu ili eksterna jugularna vena koja se može koristiti za pristup kod dece. Izbor mesta punkcije vene obično se određuje na osnovu lokalizacije malignog oboljenja (kontralateralna strana kod jednostranog karcinoma dojke), prisustva infekcije, tromboze vena ili prethodno postavljenog pejsmejkera. Prosečna dužina katetera gde se postiže željeni položaj (do kavotrijalne spojnice) je kod punktirane jugularne ili vene subklavije oko 18 cm na desnoj i 22 cm na levoj strani. Tokom procedure neophodno je EKG nadgledanje. Nakon procedure, položaj katetera se proverava radiološkim pregledom-radiografijom pluća, koji takodje isključuje prisustvo pneumotoraksa. (2)

Najčešća komplikacija i najčešći razlog eksplantacije katetera je infekcija i zato je neophodna antimikrobna profilaksa [7]. Ostale komplikacije se mogu podeliti prema mehanizmu na:

- Komplikacije tokom intervencije (punkcija arterije, hematoma, vazdušna embolija, pneumotoraks, srčane aritmije, perforacija srčanih šupljina i velikih krvnih sudova)
- Komplikacije vezane za kateter (malpozicija, tromboza, okluzija, knikovanje katetera, nekroza kože)
- Vaskularne komplikacije (tromboza vena, arteriovenske fistule)

Druga podela komplikacija vezanih za implantaciju port-a-cath sistema je sledeća: - rane (između 24 sata i 4 nedelje od implantacije) i - kasne (4 nedelje nakon implantacije) [3]

Svrha rada je bila da predstavi iskustvo Kliničko-bolničkog centra Bežanijska kosa vezano za implantaciju port-a-cath katetera.

Implantacija port-a-cath sistema predstavlja hiruršku proceduru koja se sprovodi u operacionoj sali pod lokalnom anestezijom u aseptičnim uslovima. Svim pacijentima je bilo potrebno često davanje parenteralne terapije i uzorkovanje krvi za laboratorijske analize, a indikaciju za implantaciju port-a-cath sistema postavljao je onkolog ili hirurg. Zbog kompromitovanog imunološkog statusa i sprečavanja infekcije kateterom, svi pacijenti su dobili profilaktičku dozu antibiotika ceftriaksona 2 g na 1 sat pre procedure. Mesto plasiranja je uglavnom bila desna vena subclavia, dok je kod pacijentkinja koje su bile podvrgnute totalnoj mastektomiji port postavljen na suprotnoj strani. U uslovima lokalne anestezije kateter je plasiran tehnikom direktne punkcije vene na osnovu anatomskih tačaka. Ispred pektoralnog mišića napravljen je džep u potkožnom tkivu gde je komora postavljena i učvršćena. Na kraju procedure, komora je isprana rastvorom heparina u koncentraciji od 100 ij / ml. Posle procedure položaj katetera je verifikovan rendgenskim snimkom. Pacijenti i njihove porodice su obučene za upotrebu, ispiranje i sprečavanje infekcija sistemom port-a-cath.

PRIKAZ SERIJE SLUČAJEVA

U našoj ustanovi je od januara 2017. do 31. januara 2018. kod onkoloških pacijenata implantirano 16 port-a-cath vaskularnih katetera.

Slika 1: Raspodela onkoloških pacijenata koji su podvrgnuti implantaciji port-a-cath katetera

approach at children. The choice of the place of vein puncture is usually determined on the basis of localization of the malignant disease (contralateral side at unilateral breast cancer), the presence of infection, vein thrombosis or previously placed pace – maker. The average length of the catheter to reach the wanted position (till cavoatrial junction) when punctured jugular or vein subclavian is 18 cm on the right side and 22 cm on the left side. During the procedure EKG monitoring is necessary. After the procedure the position of the catheter is checked by the lung x-ray which excludes the presence of pneumothorax as well. [2]

The most common complication though and the most common reason of catheter explantation is infection and that is why the antimicrobial prophylaxis is necessary. [7]

Other complications can be divided according to time of origin as follows:

- complications during the intervention (puncture of artery, hematoma, air embolism, pneumothorax, heart arrhythmias, perforation of heart hollows and big blood vessels)
- complications related to catheter (dislocation, thrombosis, occlusion, rupture of catheter, narcosis of skin)
- vascular complications (thrombosis of vein vessel, arterial vein malformations)

Other division of complications related to the implantation of port-a-cath system is as follows:

- early (between 24 hours and 4 weeks from implantation)
- late (4 weeks after implantation) [3]

The purpose of the work was to present the experience of Clinical Hospital Center Bezanijskakosa related to implantation of port-a-cath catheter.

Method

Implantation of port-a-cath system presents the procedure that is performed in operation room under local anesthesia in aseptic conditions.

All the patients needed frequent parental therapy taking and blood sampling for lab analysis and the indication for implantation of S port-a-cath system was set up by an oncologist or a surgeon.

Due to compromised immunology status and prevention of the catheter infection all the patients got the prophylactic dose of antibiotics Ceftriaxone 2 g an hour before the procedure.

The placement mostly was set up in the right veinsubclavian whilst with the female patients that were exposed to total mastectomy port was placed on the opposite side. In the conditions of local anesthesia catheter was placed by the technique of direct puncture of vein on the basis of anatomy points. In front of pectoral muscle the pocket in subcutaneous tissue was made where the chamber was positioned and fixed. In the end of the procedure the chamber was rinsed with the solution of heparin in concentration of 100ij/ml. After the procedure the position of catheter was verified by the x-ray.

The patients and the accompanied families were educated for the usage, rinse and infection prevention of the port-a-cath system.

Results

In our institution since January 2017 until 31st January 2018, 16 port-a-cath vascular catheters were implanted to oncologic patients.

The highest percentage of the patients got the therapy for the breast cancer [8], 3 patients were treated from the stomach cancer, 2 from pancreas cancer and bile ducts and 3 patients had hematological malignancy (Figure 1). The patients in average were aged 48 (27 – 75).

Figure 1: Distribution of oncologic patients underwent the port-a-cath implantation

Najveći procenat bolesnika dobio je terapiju zbog karcinoma dojke (8), 3 bolesnika su lečena od raka želuca, 2 od karcinoma pankreasa i žučnih vodova, i 3 pacijenta su imala hematološki malignitet (slika 1). Prosečna starost pacijenata je bila 48 godina (27 - 75).

Nije bilo ranih komplikacija tokom plasiranja porta. Kasne komplikacije se javile kod 2 pacijentkinje – dislokacija katetera kod jedne, koja je zahtevala ponovljenu inserciju porta, a kod druge pacijentkinje je došlo do rotacije komorice porta koja je rešena u lokalnoj anesteziji.

DISKUSIJA

U razvijenim zemljama upotreba ovih katetera je standardna u lečenju onkoloških pacijenata, dok su u zemljama u razvoju podaci o upotrebi ovih katetera oskudni, što je verovatno posledica nedostupnosti i visokih troškova samog katetera. Port-a-cath sistemi su zatvoreni i njihova funkcija je da omoguće pristup centralnom vaskularnom sistemu. To omogućava upotrebu kože kao prirodne barijere protiv infekcije i vađenje igle za ubod nakon svake upotrebe. Prednosti tako zatvorenog sistema su smanjena mogućnost infekcije, jednostavno održavanje porta koji se ne koristi, estetska dobit od supkutano postavljene komore, obezbeđivanje pokretljivosti pacijenata, kao i obavljanje njihovih uobičajenih dnevnih aktivnosti i smanjena mogućnost komplikacija u vezi sa centralnim i perifernim venskim kateterima [1]

Infekcije, hematomi, malpozicija katetera, pneumothorax, tromboza/embolizacija, knikovanje katetera su i dalje važne komplikacije koje prate implantaciju porta-a cath katetera. Tokom protekle decenije izveštaji ukazuju da se stopa komplikacija značajno smanjila poboljšanjem same tehnike plasiranja kao i materijala samog katetera. Ranije su korišćeni kateteri Hickman i Broviac, a danas se koriste port-a cath zbog lakoće pristupa i niže stope komplikacija [8,9]. Kako je tehnologija proizvodnje katetera i mate-

rijala poboljšana, danas su kateteri sa implantabilnim portom lakši, jači i mogu da podrže veći pritisak tečnosti za česte dijagnostičke procedure kojima su izloženi onkološki pacijenti [10-17].

Prema našem iskustvu, ova procedura je praćena kasnim komplikacijama koje su se javile kod 12,5% pacijenata. Dislokacija katetera koja je dovela do ponovljene insercije porta se javila kod 6,25% pacijenata, i takođe je kod 6,25% pacijenata došlo do rotacije komorice porta. Ove komplikacije su rešene rutinski i nisu značajno uticale na protokol lečenja.

Prednosti ove procedure su bile brojne. Ponovna upotreba standardnog CVK ponekad dovodi do skleroze krvnih sudova. Vene pacijenata sa port-a-cath sistemima su bile zaštićene i izbegla se ponovljena implantacija CVK, osim kod jedne pacijentkinje zbog dislokacije katetera. Takođe, korišćenje port-a-cath sistema imalo je koristi za medicinsku negu i druge procedure lečenja, pružajući medicinskom osoblju jednostavan pristup venskom putu.

Subjektivna procena svih pacijenata sa ugrađenim port-a -cath sistemom je poboljšani kvalitet života. Glavne prednosti koje su primetili pacijenti bile su veća pokretljivost i poboljšana udobnost.

ZAKLJUČAK

Plasiranje port-a-cath sistema značajno poboljšava kvalitet života i pacijenti su iskusili veću pokretljivost i udobnost. Subjektivnom procenom svih pacijenata sa ugrađenim port-a -cath sistemom je utvrđeno poboljšanje kvaliteta života. Vene pacijenata su zaštićene od skleroze i izbegnuta je ponovljena implantacija CVK-a. U našoj ustanovi je ugrađeno 16 port-a-cath vaskularnih katetera kod onkoloških pacijenata od januara 2017. do 31. januara 2018. Nije bilo ranih komplikacija, a kod 12,5% pacijenata su se javile kasne komplikacije. Prednost ove metode je da medicinsko osoblje ima jednostavan pristup venskom putu za davanje terapije ili uzorkovanje krvi za laboratorijske analize.

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There were no early complications during the placing of the port. Two patients had late complications - dislocation of the catheter with one that led to renewed insertion of port and the other patient had the rotation of port chamber that was solved in the local anesthesia.

DISCUSSION

In developed countries the usage of these catheters is standard in the treatment of oncologic patients whilst in developing countries the data about the usage of these catheters is poor, probably due to inaccessibility and the high costs of the catheters.

Port-a-cath systems are closed and their purpose is to provide access to the central vascular system. It gives possibility to use the skin as a natural barrier against infection and to take out a puncture needle after each usage. The advantages of such a close system are decreased possibility of infection, simple maintenance of the port that is not in use, esthetic benefit of subcutaneously positioned chamber, providing the mobility of patients as well as doing their normal daily activities and decreased possibility of complications related to central and peripheral venous catheters. [1]

Infections, hematoma, malposition of the catheter, pneumothorax, thrombosis, embolization, catheter knicking are still important complications that follow the implementation of a port - a - chat catheter. During the last decade the reports indicate that the rate of complications has been reduced significantly due to improvement of the placing technique it self as well as the material of the catheter. Previously Hicman and Borivac catheters were used and nowadays port - a - chat catheters are used due to easy accessibility and lower rate of complications. [8,9]. As the technology of producing catheters and materials has been improved, nowadays catheters with

implantable port are lighter, stronger and can support higher pressure of the liquids for frequent diagnostic procedures that the malignant patients are exposed to. [10-17]

In our experience, this procedure was accompanied with late complications occurred in 12.5% of patients. Dislocation of the catheter that led to renewed insertion of port occurred in 6.25% and also, in 6.25% of patients the rotation of port chamber occurred. These complications were resolved routinely and did not significantly affect the treatment protocol.

Advantages of this procedure were numerous. Reuse of standard CVC sometimes leads to sclerosis of the blood vessel. The veins of the patients with port-a-cath systems were protected and the reimplantation of CVC is avoided, except for one patient due to dislocation of the catheter. Also, using port-a-cath systems had benefits for medical care and other treatment procedures providing a greater comfort to medical staff by simple approach to vein route.

Subjective assessment of all the patients with implanted port-a - chat system is improved quality of life. The main advantages observed by patients were greater mobility and improved comfort.

CONCLUSION

Placing of port-a-cath system significantly improves the quality of life in the following ways:

The veins of the patients were protected from sclerosis reimplantation of CVC is avoided. Medical staff has simple approach to the vein route for therapy giving or blood sampling for the lab analysis. Patients experienced greater mobility and comfort.

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