SŁAWOMIR MOZUL, AGNIESZKA GRZEBALSKA, ANDRZEJ KSIĄŻEK

Retrospektywna 10-letnia obserwacja powikłań związanych z utrzymywaniem w jamie otrzewnej cewników u pacjentów leczonych metodą dializy otrzewnowej

Streszczenie

Wstęp. Dializa otrzewnowa jest stosowana jako przewlekła metoda leczenia nerkozastępczego od lat 70-tych XX wieku. Jednym z podstawowych warunków koniecznych do adekwatnego prowadzenia dializoterapii otrzewnowej jest prawidłowa funkcja cewnika implantowanego do jamy otrzewnej. Implantacją cewników do dializ otrzewnowych zajmują się głównie chirurdzy, ale również w niektórych ośrodkach nefrolodzy bądź radiolodzy zabiegowi.

Cel. Celem pracy jest przedstawienie własnych, retrospektywnych obserwacji dotyczących implantacji cewników do dializy otrzewnowej przez chirurgów i nefrologów.

Materiał i metodyka. Retrospektywnej analizie poddano losy pacjentów z przewlekłą schyłkową niewydolnością nerek leczonych metodą dializy otrzewnowej w Klinice Nefrologii Akademii Medycznej w Lublinie, latach 1998-2007. W tym okresie leczono metodą dializoterapii otrzewnowej 194 pacjentów. Cewniki były implantowane przez nefrologów i chirurgów. Nefrolodzy stosowali do implantacji cewników metodę Seldingera, chirurdzy tzw. ślepą metodę chirurgiczną.

Wyniki. W obserwacjach retrospektywnych przeprowadzonych w naszym ośrodku można zauważyć znacznie większą liczbę cewników implantowanych przez nefrologów (171), w stosunku do liczby cewników zakładanych chirurgicznie (23). Również widoczna jest względna przewaga liczby powikłań w metodzie chirurgicznej, chociaż obie stosowane metody są do siebie bardzo podobne.

Wnioski. Implantacja cewnika do dializ otrzewnowych przez doświadczonego nefrologa jest bezpieczną procedurą, zapewniającą wartościowy, długoterminowy dostęp do leczenia nerkozastępczego.

Słowa kluczowe: dializa otrzewnowa, cewniki do dializy otrzewnowej, implantacja.

Retrospective 10-year observation of complications associated with maintaining of catheters in the peritoneal cavity in parients treated with the method of the peritoneal dialysis

Abstract

Introduction. Peritoneal dialysis has been applied as the chronic kidney-replacing procedure since the 70s of the 20th century. One of the essential conditions necessary for the appropriate conducting of the therapy of peritoneal dialysis is a correct function of the catheter implanted to the peritoneal cavity. Surgeons usually deal with implantation of catheters in peritoneal dialyses, but also at some centers nephrologists or treatment radiologists perform these.

Aim. The purpose of the study is presenting own, retrospective observation concerning implantation of catheters in peritoneal dialysis by surgeons and nephrologists.

Material and methods. Patients with the chronic final kidney failure treated with the method of peritoneal dialysis were subjected to a retrospective analysis of The Department of Nephrology, Medical University of Lublin in the years of 1998-2007. In that period 194 patients were treated with the method of peritoneal dialysis therapy. Catheters were implanted by nephrologists and surgeons. Nephrologists applied Seldinger method for implantation of catheters, surgeons – the so called 'blind method'.

Results. In retrospective observation conducted at our centre, it is possible to notice a larger number of catheters implanted by nephrologists in the number of 171, in proportion to the number of catheters established surgically – in the number of 23. A relative majority of the number of complications is also visible in the surgeon's method although both applied methods are very similar to each other.

Conclusions. Implantation of the catheter in peritoneal dialyses through the experienced nephrologists is a safe procedure, providing with the valuable, long-term access to the kidney-substitution treatment.

Key words: peritoneal dialysis, catheters for the peritoneal dialysis, implantation.

Chair and Department of Nephrology, Medical University of Lublin

INTRODUCTION

Peritoneal dialysis is an option of the kidney-substitution treatment which provides patients suffering from chronic nephropathy with great autonomy and the optimum quality of life. This method consists in using the peritoneal membrane as a specific „ dialysis machine" thanks to using its property as the selective, semipermeable barrier between the bearing of the peritoneal blood flowing through capillaries and the dialyzing liquid inside the peritoneum.

Peritoneal dialysis has been applied as the chronic kidney-replacing procedure since the 70s of the 20th century [1,2]. At present it is applied by over 25 thousand patients in the USA [3], in Poland the numbers range from 1000 to 1300 patients in the sequence of the year. One of the essential conditions necessary for the appropriate conducting peritoneal dialysis is a correct function of the catheter implanted to the peritoneal cavity. Worldwide, different types of catheters and methods of implantation are applied. Catheters are implanted by surgeons, nephrologists and treatment radiologists [1,4].

A main worry appears to be a maximum limiting of the complications associated with the presence of the catheter is in the peritoneal cavity. The most frequent complications are: leakage of dialyzing liquid along the channel of the catheter, infiltration of liquid to other tissues beyond the peritoneum, obstruction of the catheter, migration of the catheter, inflammatory condition of the catheter outlet and the entire tunnel, dialyzing peritonitis. In the current study our own observation concerning complications associated with applying catheters for peritoneal dialyses in the aspect of surgeon's implantation and through the nephrologists was presented.

AIM

Presenting own, retrospective observation concerning implantation of catheters for the peritoneal dialysis by surgeons and nephrologists, is the purpose of this study.

MATERIAL AND METHODS

Patients with the chronic final kidney failure treated with the method of the peritoneal dialysis were subjected to a retrospective analysis of The Clinic and Chair of Nephrology, Medical University of Lublin in the years of 1998-2007. In this period 194 patients were treated with the method of peritoneal dialysis therapy: 106 women (54.6%) and 88 men (46.4%). Catheters were implanted by nephrologists in 171 cases (88%) and by surgeons in 23 cases (12%).

Nephrologists applied Seldinger method for implantation of catheters. In the local anesthesia the skin and a subcutaneous layer were incised at about 2 cm below the navel, length of incision being of about 3 cm. A white line was revealed; next with troacar a white line and a wall of the peritoneum were pierced. Through the hole arising, about 2 liters of liquid was being entered into the peritoneal cavity for peritoneal dialysis. Next with the use of the guide wire, a Tenckhoff catheter of „ coiled" or „ straight" type was being inserted into the peritoneal cavity. In this case, a cooperation of the doctor with the patient is required with aim of the correct identification of placing of the end of the catheter in the peritoneal cavity (Douglas cavity).

Internal muff was placed directly by the hole in the white line. A tobacco-bag suture was tightened round the catheter with aim of the reduction in the risk of the leakage of dialyzing liquid. Consecutively, a tunnel was produced in the subcutaneous layer, situating the outside muff about 2-3 cm from the outlet channel of the catheter. After implantation of the catheter liquid was released from the peritoneal cavity. Surgeons applied the so called 'blind method'. In the local anesthesia, after making an incision in the skin, the subcutaneous layer and the peritoneum in subumbilical surrounding at the length of about 2-3 cm, Next with the use of the guide wire a Tenckhoff catheter was inserted into the peritoneal cavity. Next the openings were sutured in coatings of the abdominal cavity producing the tunnel in the subcutaneous layer.

RESULTS

The results of the observations are presented in Tables 1 and 2.

TABLE 1. Early complications after implantation of Tenckhoff catheter (< 6 weeks from implantation).

Type of complications	Implantation by a surgeon 23 patients	Implantation by a nephrologist 171 patients
Leakage of the dialyzing fluid along the catheter	5 (22%)	14 (8.18%)
Catheter migration	2 (8.69%)	9 (4.6%)
Catheter obstruction	1 (4.34%)	3 (1.75%)
Inflammation of the exit site of catheter (ESI)	4 (17%)	8 (4.12%)
Dialysing peritonitis	2 (8.69%)	5 (2.57%)

TABLE 2. Late complications after implantation of Tenckhoff catheter (>6 weeks from implantation).

Type of complications	Implantation by a surgeon 23 patients	Implantation by a nephrologist 171 patients
Deaths	4 (16.6%)	23 (13.38%)
Duration of peritoneal dialysis in months(the mean and SD)	24 (17.4 SD)	30 (24.3 SD)
Catheter obstructions	4	21
Inflammation of the exit site of catheter (ESI)	12	47
Catheter migration	7	27
Dialysing peritonitis	23	126
Catheter reimplantation	6 (26%)	27 (15.7%)

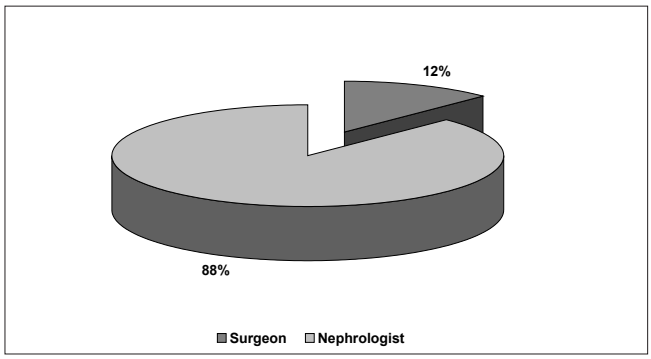

FIGURE 1. Implantation of Tenckhoff catheter for peritoneal dialyses in the years of 1998-2007.

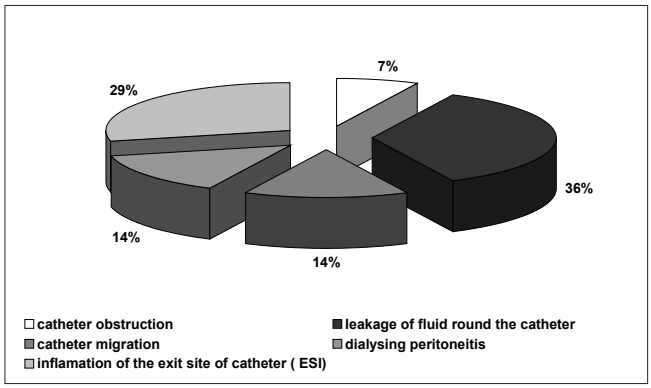

FIGURE 2. Early complications after surgeon's implantation of Tenckhoff catheter (< 6 weeks from implantation in percents).

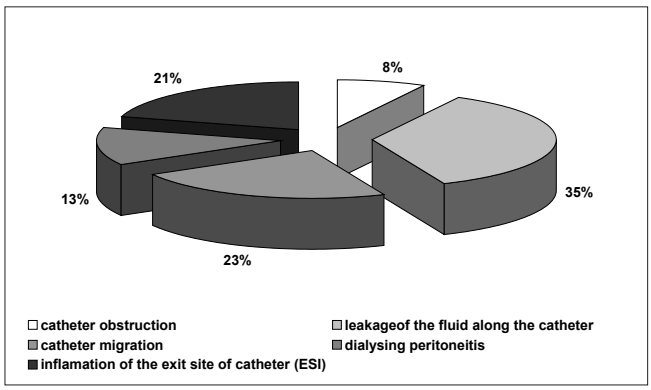

FIGURE 3. Early complications after nephrologist's implantation of Tenckhoff catheter (< 6 weeks from implantation in percents).

DISCUSSION

In retrospective observations conducted at our centre, it is possible to notice a far larger number of catheters implanted by nephrologists in proportion to the number of catheters established surgically. A relative majority of the number of complications is also visible in the surgeon's method although both applied methods are very similarly implemented. Main differences concern the size of "damage" of the peritoneum and the way of the identification of the outlet of catheter in the peritoneal cavity. An incision of the peritoneum of 2-3 cm is applied in the surgeon's method; at the nephrologists' implantation a spot tunnel made by troacar corresponding to the diameter of the catheter for peritoneal dialyses is made.

The nephrologist, during implantation of the catheter, is holding the constant verbal contact with the patient, at putting the catheter in Douglas cavity, the patient is reporting feeling of an urge to pass a stool. While in the surgeon's method the catheter is inserted deep toward the pelvis, without the verbal communication of the patient and the doctor (the so called 'blind method').

As the significance of results is concerned, classification of patients is relevant as for the surgeon's method and implantation done by the nephrologist. Patients were qualified by the nephrologist for implantation of catheters without so called 'surgical past' as regards the abdominal cavity, in a good general condition. However patients after operations within the abdominal cavity, requiring simultaneous supplying of hernia, were operated on by the surgeon. All re-implantations of catheters due to different complications were also conducted surgically. At present in the world literature, one pays attention to methods of perioneal dialysis catheters implantation with the use of the specialised equipment serving the need of visual evaluation of the inner structure of peritoneal cavity. These methods are mainly applied by the surgeons and require general anaesthesia [1-3,5,6].

Although none of methods is generally recommended, special attention should be devoted to a laparoscopy method. Crabtree et al. described advanced laparoscopy method with the access through straight muscle of the abdomen, with preventive removing of adhesions, and moving the network to higher batches of the abdomen by means of the sutures [5]. This group presented significant reduction in the complications associated with the patency of the catheter to below 1% in comparison to 12% in the laparoscopy standard method. In patients with the increased risk of malfunctions of catheter (e.g. after treatments on the abdominal cavity) this method seems to be particularly recommended.

Early obstruction of the catheter and the early leakage at exit of the catheter are common and they can be discouraging for the patient and due to that, they can adversely affect the attitude of the patient towards the procedure. Using laxatives such as lactulosa or senna shouldn't be underestimated and it should be applied before and during the training of inserting the catheter. Constipation is associated with impairment [7] of function of the catheter because it can be responsible for the migration of the catheter and the pressure from the outside to the light of the catheter. Using large doses of laxatives to increase the peristalsis is a frequent practice with a view to keeping functions of the catheter at first, in spite of the lack of constipations.

Blocking the inflow suggests the intra-catheter block usually caused by fibrin or blood, but can also take place while twisting the catheter. Using thrombolytic agent to the catheter is of help. It is additionally thought that those problems with the catheter are a serious cause of failures of the technique of curing and metabolic effects of the dialysate can increase the risk of cardio-vascular problems. Mechanical complications, associated with the catheter are responsible in 20% for the transfer of patients to hemodialyses [7]. Having frequent consultations between nephrologists and the surgeon's team at implementing the procedure is an important aspect of kidney – substitution treatment procedures. Similarly at centers, where catheters are implanted by radiolo-

gists a good nephrological-radiological cooperation should take place between the team.

In research worldwide it has been shown that catheterizing by the renal specialist has a positive effect on the number of patients included in the program of the peritoneal dialysis. Amongst considered causes of this issue one may mention: simpler decision after presenting to the patient information about the method by the renal specialist, faster completion of implantation of the catheter through the nephrologist, without prolonged waiting for the date of the treatment. Moreover, maintaining the catheter by the nephrologist constitutes a certain type of the platform thanks to which the patient from the beginning is appropriately educated as for the whole spectrum of the procedure [1,2,6,8].

CONCLUSION

Implantation of the catheter in peritoneal dialyses by the experienced nephrologists is a safe procedure, providing with the valuable, long-term access to the kidney-substitution treatment.

REFERENCES

1. Zaman F. Peritoneal dialysis catheter placement by nephrologist. Perit Dial Int. 2008;(28):138-41.
2. Wilkie M, Wild J. Peritoneal Dialysis Access – Results from UK Survey. Perit Dial Int. 2009;29:355-7.
3. Aakash H Gajjar AH, Rhoden DH, Kathiura P, Kaul R, Udupa AD, Jennings WC. Peritoneal dialysis catheters laparoscopic versus traditional placement techniques and outcomes. Am J Surg. 2007;194:872-6.
4. Brunier G, Hiller JA, Drayton S, Pugash RA, Tobe SW. A Change To Radiological Peritoneal Dialysis Catheter Insertion: Three-Month Outcomes. Perit Dial Int. 2010;30:534-27.
5. Crabtree JH, Arnold A. Laparoscopic approach under local anesthesia for peritoneal dialysis acces. Perit Dial Int. 2000;(20):757-65.
6. Chow KM, Szeto CC, Leung CB, Ching B, Kwan H, Pang WF, Li PK. Tenckhoff Catheter Insertion by Nephrologists: Open Dissecton Technique. Perit Dial Int. 2010;30:524-7.
7. Brendan B, McCormick, Bargman JM. Noninfectious compl of peritoneal dialysis: Implications for patients and technique survival. J Am Soc Nephrol. 2007;18:3023-5.
8. Asif A, Pflederer TA, Viera CF, Diego J, Roth D, Agarwal A. Does catheter insertion by nephrologist improve peritoneal dialysis utilization? A multicenter analysis. American Society of Diagnostic and Interventional Nephrology Section Editor: Stephen Ash. Seminars in Dialysis. 2005;18(2):157-60.

Informacje o Autorach

Dr n.med. Sławomir Mozul – starszy asystent; dr n. med. Agnieszka Grzebalska – adiunkt; prof. dr hab. n. med. Andrzej Książek – kierownik, Katedra i Klinika Nefrologii, Uniwersytet Medyczny w Lublinie.

Adres do korespondencji

Sławomir Mozul
Katedra i Klinika Nefrologii
Uniwersyt Medyczny w Lublinie
ul.Jaczewskiego 8, 20-954 Lublin
tel. 81 7244704,
e-mail: slawek.mozul@poczta.fm