

MÁRIA LEHOTSKÁ

The Possibility of Urine Derivation in Patients with Total Spinal Cord Lesion in Home Environment

Możliwość derywacji moczu u pacjentów z uszkodzeniem rdzenia kręgowego w środowisku domowym

Faculty of Health, Catholic University in Ružomberok, Slovakia

Abstract

My conference paper refers to the possibility of deriving urine in patients with total spinal cord lesion at home. The aim of the study is to compare the use of traditional and new approaches to the derivation of urine. Considering the specific problematic, qualitative method of research – the case study was used. The choice of the case was intentional. The obtained results are in accordance with contemporary overhauled view to the nursing care of sphincter functions of paraplegics. In contrast to the new methods, a higher incidence of urinary tract infections connected to the traditional way of urine derivation was proven (Piel. Zdr. Publ. 2012, 2, 4, 291–295).

Key words: intermittent clean cathetrization, neurogenic urinary bladder, derivation of urine, total spinal cord injury, paraplegics.

Streszczenie

Artykuł odnosi się do możliwości wyprowadzenia moczu u pacjentów z całkowitym uszkodzeniem rdzenia kręgowego w warunkach domowych. Celem badania jest porównanie wykorzystania tradycyjnych i nowych metod wyprowadzenia moczu. W tym celu została wybrana jakościowa metoda badań – studium przypadku. Wybór przypadku był zamierzony. Uzyskane wyniki są zgodne ze współczesnymi poglądami na opiekę pielęgniarską czynności zwieracza w paraplegii. W przeciwieństwie do nowych metod, udowodniono częstsze występowanie zakażeń dróg moczowych związane z tradycyjnym sposobem pozyskiwania moczu (Piel. Zdr. Publ. 2012, 2, 4, 291–295).

Słowa kluczowe: czyste cewnikowanie przerywane, pęcherz neurogenny, wyprowadzenie moczu, uszkodzenie rdzenia kręgowego, paraplegia.

Spinal cord lesions happen to be connected with failures of movement, with trophic, sexual and sphincter dysfunctions of various scale and intensity. The clinical picture is developing rapidly and corresponds to the localization and scale of the spinal cord injury. The patient in acute posttraumatic phase experiences a state of spinal shock. The functional consequence of spinal shock in urinary tract is atonia and areflexia of the urinary bladder. For this reason what occurs is an overflow of the urinary bladder and its incapacity of spontaneously emptying out; therefore, it is important to derive the urine. After the disappearance of spinal shock, it is possible spontaneously to empty out the urinary bladder, however often incompletely and imperfectly.

The possibility of urine derivation shows itself as one of the priorities in both – the acute as well as the postacute phase. Dysfunctions of the lower urinary tract can lead to irreversible damage of renal functions. Very important is effective and long-term protection of the upper urinary tract as well as effort to reach full or partial continence of urine. The final aim is to improve the quality of the patient's life.

Patients themselves find effective urine derivation an important factor, which can substantially improve the quality of their life. Urinary incontinence among patients suffering from spinal cord lesion poses a serious medical, psychological, social and economic problem.

Loo, et al. [6] have been watching prioritizing of needs among 453 patients in long-term care for

the past 12 months. Out of 26 categories which have been scrutinized, the regulation of emptying out the urine got the highest score. Similar conclusions, concerning prioritizing of needs among patients suffering from spinal cord lesion have been reached by numerous authors [9, 10, 12, 15] independently of social and cultural context.

Changes in the uropoetic system substantially predispose patients to form various complications (uroinfection, concrements, damage of urethra, decubitus); therefore, it is important to eliminate possible complications through effective techniques of urine derivation. The basis for a positive choice of technique is the assessment of urologic and neurologic findings with each patient.

Among various techniques of urine derivation in postacute and chronic phase widely used in our practice we can count the following methods: application of a permanent catheter, suprapubic episcistomy, provoked reflex miction, trigger, crede maneuver, condom drain, intermittent cathetrization and scandinavian model.

The aim of the work is to compare efficiency and occurrence of complications while using traditional and new approaches to urine derivation among patients with neurogenic bladder as a result of traumatic spinal cord lesion in home environment.

Materials and Methods

Concerning specific problematics requiring detailed analysis, the chosen method of qualitative research was the case study. The selection of the case was intentional – a patient with a spinal cord lesion receiving care for sphincter functions representing urine derivation through various procedures. The primary source of information was the patient himself and medical documentation. Mr. XY was addressed by telephone, based on a selection from the patient database of GP, and was informed about the aim and content of the study. After receiving informed consent we met our patient repeatedly at home with the intention to clarify some details from the documentation and to acquire a subjective view concerning the problematics of sphincter functions care.

Results

Anamnesis

25 years old patient 4 years after the back injury was diagnosed as a scatterable fracture of spondyle Th12 and L4 with transversal spinal cord lesion, stp. Fixatio transpedicularis Th12-L2, corpoplastica

Th12. Present paraplegics, failures of sensitivity to all modalities from omphalus and lower, incontinence of urine and bowel movement. At the moment the patient was in home care and wheelchair bound, self-sufficient partially (ADL). Urine in acute phase derived through permanent catheter, later (after 6 months) due to repeated urine infections and overall complications as a consequence of frequent use of antibiotics (colitis, mycotic infections, intestinal dysmicroby) there was a transition to emptying out urine through provoked reflex miction – trigger, without positive effect. Currently the patient has been using the technique of intermittent autocathetrization for about 2 years, evaluated subjectively by the patient himself as being very beneficial. Based on clinical picture as well as documentation data we can objectively confirm substantially lower appearance of complications in uropoetic system.

Catamnesis

24.6.2008 after falling from height, Mr. XY was diagnosed with scatterable fracture Th12-L4 with dislocation of particles and subsequently with total spinal cord lesion. Stabilizing surgery was performed on the day of accident (fixatio transpedicularis Th12-L2, corpoplastica Th12) with continued standardised medication, monitoring and medical treatment at the clinic of neurosurgery.

Urine is derived through a permanent catheter. In regular weekly intervals urine is derived for C&S (culture and sensitivity). Repeated cultivation findings of *E. coli*, however without clinical symptomatology. Urine is chemically negative.

According to the data from the documentation (14.7.2008) after 3 weeks – overall serious and difficult conditions (depression, pancreatitis, total spinal cord lesion with paraplegics, bronchopneumonia) complicate urine infection. “Patient indicates pain in lower abdomen, macroscopic hematuria, shiver, TT 40°C, urine chem: blood +++, proteins +++, C & S: Klebsiella, indicated ATB therapy – Biseptol”.

Following 10 days of antibiotic treatment, the patient is without clinical difficulties, urine chem. negative, cultivation presence of *E. coli*. In the course of hospitalization, standardised care of permanent catheter continues with its regular replacement (after 3 weeks, or as needed). In the course of hospitalization, standardised care of permanent catheter continues with its regular replacement (after 3 weeks, or as needed) and with flush of catheter depending on the need.

Derivation of urine continues through a permanent catheter during the time of patient's hospitalization (after 3 months due to repeated com-

plications – ileus, systemic dermatomycosis) and even after release for home treatment. The patient was instructed in looking after the permanent catheter, its regular replacements in urological surgery and importance of drinking discipline for the prevention of urine infection. Despite regular replacement of permanent catheter and following all recommended procedures in taking care of permanent catheter, there is an occurrence of urine infections (about once a month) with clinical symptomatology as well as urine findings.

According to the data from the medical documentation (October 2008): “Examination in urological surgery, replacement of permanent catheter, patient indicates pain in lower abdomen, TT 39°C, macroscopic hematuria, urine chem: blood +++, proteins ++, C&S: *E. coli* 10⁸/1 ml“. Repeated antibiotic therapy, flush of urinary bladder by Povidone iodine.

The patient is actively searching for information concerning the possibility of solving his health condition in specialized magazines, on the Internet, he is getting in touch with people of similar diagnosis nearby. While visiting a urologist, the patient repeatedly insists on removing the catheter and applying intermittent catheterization; however, in regard to his condition he was recommended to continue in the aforesaid way of urine derivation.

After half a year, due to repeated urine infections and after recommendation of a urologist, the emptying out of urine through provoked reflex miction – trigger was applied, without positive effect. In the documentation we do not find any examination results on which the indicated way of urine derivation was based.

In January 2010 he was accepted for a rehabilitation stay in NRC Kovacova. According to the data from documentation: “Urine derivation for about a year through provoked reflex miction, repeated urine infections treated by ATB. Also currently in antibiotic treatment (Macrimor). Cultivation presence of *Klebsiella*, macroscopic hematuria, urine chem: blood ++, proteins +”.

After treating the uroinfect with patient, we found repeated indication of Usg of urinary bladder with conclusion: “due to extensive residuum (80 ml) the urine derivation through reflex miction is not suitable“. Following urodynamic examination, intermittent cathetrization is indicated. Intermittent cathetrization applied in regular 6 hour intervals. Mr. XY is actively interested in the technique of intermittent cathetrization, he is expecting improvement of his health condition, also based on the information he himself found on the internet or in specialized magazines. The patient being instructed by the NRC nurses performs autocathetrization after 6 hours. Chemical

and cultivation test of urine are performed every two weeks. Sporadic diagnosis of *E. coli*, without clinical symptomatology.

After being released from NRC, the patient continues in urine derivation through intermittent autocathetrization in his home environment. In the course of the first year of intermittent autocathetrization – applied antibiotics (Macrimor) only once, due to urine infection. In the second year of using the aforesaid method – so far without clinical symptomatology, occasional cultivation findings of *E. coli*.

The patient finds such method of urine derivation very positive. “Intermittent cathetrization is a very good method, I have got a lot fewer infections, almost none of them. However the most important fact is that I can cathetrize myself depending on the need and I am not limited as I used to be before with permanent catheter. I would not wish to get back to it. Only I don’t understand why I had been left to suffer for so long“.

Discussion

Among patients following traumatic spinal cord lesions, it is the optimal and correct method of urine derivation which represents a substantial part of nursing care. In acute phase and with our patient, the urine was derived through a permanent catheter, applying this method of urine derivation for more than half a year, even despite repeated uroinfections with clinical manifestation and cultivation findings in urine.

We suppose that the repeated urine infections were caused by the overall difficult condition as well as by making a wrong decision concerning the method of urine derivation or its long-term application.

As it is pointed out by Sutorý, Wendsche [13], Krhut [3], Bojar, Mazanec, Kučera [1], Malý, Sedmák [8] – permanent drainage is currently indicated in the cases requiring only a short term solution of urine derivation, mostly connected to intensive medical care (measuring of hourly diuresis). With patients in the phase of spinal shock, the urethra is significantly vulnerable, which often causes strictures, decubitus and subsequently urine infections.

A fact known from the literature is that with permanently applied transurethral catheter, after about 4 weeks, we notice 100% occurrence of urine infection. The most common roots are coliform bacterias, which are after some time polyresistent without exception [11].

We noticed a similar development of health condition with our monitored patient in the course of permanent cathetrization.

With Mr. XY we saw the occurrence of numerous complications in acute and post-acute phase: pancreatitis, depression, ileus, bronchopneumonia, which in a way influenced the decision to keep the permanent catheter with patient (a need for intensive monitoring – hourly diuresis). The aforesaid complications are the most common among patients with spinal cord lesion.

Similarly Krassiouk's et al. [2], based on literary review of 2956 studies, considers solution of intestinal and urological disfunctions to be the primary field for individuals after spinal cord lesions. Sphincter disfunctions, according to the outlined study, are the most common cause of physical and mental problems and basically of morbidity among patients following the spinal cord lesion.

After 6 months, due to repeated uroinfections with Mr. XY and following urologist's recommendation – emptying out of urine through provoked reflex miction-trigger-was performed, without positive effect.

With this patient, we repeatedly witnessed the current trend to diminish triggering and reflex irritation of urinary bladder (as being the only method), which is caused by frequent complications in the form of uroinfections (and subsequently damaging renal functions) as a consequence of insufficient emptying of urinary bladder (residuum more than 75 ml), as well as the possibility of damaging urethral sphincters and rupture of urinary bladder [7, 12]. It was due to this high residuum that the provoked miction with our monitored patient was assessed to be unsuitable.

After changing the technique to intermittent cathetrization, later autocathetrization, we noticed a significant decrease of uroinfections (once in 2 years) and the patient himself finds it highly beneficial for his personal comfort and improvement of quality of life.

Patients themselves understand the effective method of urine derivation to be the most important factor, which can contribute to improving the quality of life, independently from cultural context. Loo, et al. [6] have monitored the prioritizing of needs among 453 patients in long-term medical care (on average 13 years following the accident)

for the past 12 months. From 26 monitored areas, the regulation of emptying urinary bladder reached the highest score. Similar results have been made by numerous authors in their studies all over the world [9, 10, 12, 15].

Nowadays intermittent cathetrization represents the most effective technique of urine derivation in this specified category of patients and from the time of its implementation, the occurrence of complications has been decreased even more, due to improvements in the equipment and materials (in the past we used ordinary catheters, nowadays they are hydrophylic). Similar results confirming the positive effect of intermittent catheterization technique among patients with spinal cord lesions were reached on our behalf during the quantitative survey in 2009 and 2012, where 75% of the patients using solely clean intermittent catheterization for emptying urinary bladder or combined method of emptying (CIC+manual expression) pointed to zero or only sporadic occurrence of uroinfections (from zero to twice a year). 50% of patients using alternative methods of urine derivation pointed to occurrence of uroinfections three or more times a year.

Although intermittent catheterization represents the preferred method, it can also be connected to some complications – urethral (urethritis, stricture) or scrotal (epididymitis) or cystolithiasis [12, 14]. Appearance of these indicated complications in comparison to other methods of urine derivation is significantly lower and their minimizing is also attributed to good education and patient's compliance (autocatheterization) as well as a traumatic method of this performance [16].

Like in the previous studies [4, 5], we have noticed more the confirmation of relative unavailability of intermittent catheterization (caused by routine procedures in various departments and professional unreadiness of the staff in common workplace) rather than absolute one (paid by health insurance companies, specialized places). One requirement to make it more popular is to deepen interdisciplinary cooperation.

References

- [1] **Bojar M., Mazanec R., Kučera Z.:** Role neurologa v diagnostice, léčbě a rehabilitaci osob trpících inkontinencí moči. *Neurologia pre prax.* 2006, 7, 5, 272–275.
- [2] **Krassioukov A., Eng J.J., Claxeton G., Sakakibara B.M., Shum S., Scire Research Team:** Neurogenic bowel management after spinal cord injury: a systematic review of the evidence. *Spinal cord.* March 2010, 48, 718–733.
- [3] **Krhut J.:** *Neurologie.* Galén, Praha 2005, s. 142.
- [4] **Lehotská M., Mihalovičová J.:** Čistá intermitentná katetrizácia. [In:] *Integrovaný prístup k prevencii a péči o zdravie.* Ed.: Karafiátová M. Zlín: UTB 2008, 131–136.
- [5] **Lehotská M., Mihalovičová J.:** Intermitentná katetrizácia v manažmente neurogénneho močového mechúra u pacientov s miešnymi léziami. [In:] *Ošetrovateľská péče a porodní asistencie v praxi Jihlavské zdravotnícké dny 2012.* Eds.: Kopáčíková M., Cetlová L. Jihlava: Vysoká škola polytechnická, 2012, 502–507.

- [6] **Loo M., Post M.W.M., Bloeman J.H.A., Van Asbeck R.W.A.:** Care needs of persons with long-term spinal cord injury living at home in the Netherlands. *Spinal Cord*. 2002, 40, 8, 423–428.
- [7] **Malý M.:** Ortostatická hypotenzia u tetraplegika. *Acta Spondylogica* 2005, IV, 1, 18–19.
- [8] **Maly M., Sedmak P.:** Pacient so spinálnou léziou. *Sestra* 2005, 4, 5, 15.
- [9] **Manns J.P., Chad K.E.:** Components of Quality of Life for Persons with a Quadraplegic and Paraplegic Spinal Cord Injury. *Qual. Health Res.* 2001, 11, 6, 795–811.
- [10] **Neal D.E., Lawson A.J., Webb R.J., Robertson A.S.:** Clean Intermittent Self-Cathetrization. *International Urogynecology Journal* 1993, 4, 1, 50–55.
- [11] **Oltus B.:** Čistá intermitentná katetrizácia (unpublished material). 2006.
- [12] **Newman D.K., Willson M.M.:** Review of Intermittent Cathetrization and Current Best Practices. *Urologic nursing* 2011, 31, 1, 12–48.
- [13] **Sutorý M., Wendche P.:** Péče o vyměšování moči a stolice u pacientů s tranzverzální míšní lézí. *Neurologia pre prax* 2009, 10, 3, 151–153.
- [14] **Svitac J.:** Čistá intermitentná katetrizácia v detskom veku. Power pointová prezentácia. Martin: MFN, 2008. [cit. 2.10.2012]. Dostupné na internete: http://www.mediforum.sk/pdf/urologia/2008zi_Svitac.pdf.
- [15] **Woodbury M.G., Hayes K.C., Askes H.K.:** Intermittent cathetrization practices following spinal cord injury: A national survey. *Canadian Journal Urology* 2008, 15, 3, 4065–4071.
- [16] **Wyndaele J.J.:** Intermittent cathetrization: which is the optimal technique? *Spinal Cord* 2002, 40, 9, 432–437.

Address for correspondence:

Mária Lehotská
Katolícka univerzita v Ružomberku
Fakulta zdravotníctva
Námestie A. Hlinku 48
034 01
E-mail: maria.lehotska@ku.sl

Conflict of interest: None declared

Received: 13.12.2012

Revised: 21.12.2012

Accepted: 21.12.2012

Praca wpłynęła do Redakcji: 13.12.2012 r.

Po recenzji: 21.12.2012 r.

Zaakceptowano do druku: 21.12.2012 r.