



## Technical Note

# Standardization of the technique to perform the transanal therapeutic irrigation



Beatriz Deoti e Silva Rodrigues\*, Kelly Cristine de Lacerda Rodrigues Buzatti, Nicolás Pablo Diogo Quintão, Gustavo Monteiro Oliveira, Marcela Monteiro Pinheiro, Francielle Profeta Rodrigues, Rodrigo Gomes da Silva

Universidade Federal de Minas Gerais (UFMG), Faculdade de Medicina, Departamento de Cirurgia, Belo Horizonte, MG, Brazil

### ARTICLE INFO

#### Article history:

Received 5 June 2018

Accepted 5 August 2018

Available online 22 August 2018

#### Keywords:

Spinal cord injuries

Fecal incontinence

Constipation

Quality of life

Stomas

Therapeutic irrigation

### ABSTRACT

**Purpose:** This article aims to present a standardization of the technique of transanal therapeutic irrigation, which is an old technique that has passed through history and is now used as a medical procedure to assist in the treatment of defecation disorders.

**Methods:** This protocol was developed in patients with myelomeningocele submitted to the standard transanal therapeutic irrigation technique, in accordance with the protocol established at the Clinic of defecation disorders at a public university hospital in Brazil. The presented standard technique highlights the following topics: preparation of the patient before the treatment; interdisciplinary approach; training of the patient or the family member responsible for the patient and the step-by-step technique itself. The research ethics committee at the university approved this study.

**Discussion:** Transanal therapeutic irrigation is indicated in neurogenic bowel dysfunctions and functional disorders of defecation. Training the patient or a family member responsible for irrigation is performed on three consecutive days, all of them supervised by the nurse. This technique aims to re-establish control over defecation and bowel function, and consists in an infusion of warm tap water through the anus, which allows the patient to evacuate daily the stool and keep the colon empty for longer periods. This avoids fecal incontinence and increases the quality of life of patients with defecation disorders.

**Conclusion:** Transanal therapeutic irrigation is an effective, well-tolerated and safe procedure, which is better compared to the standard clinical care.

© 2018 Published by Elsevier Editora Ltda. on behalf of Sociedade Brasileira de Coloproctologia. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## Padronização da técnica para realização da irrigação transanal terapêutica

### R E S U M O

**Objetivo:** Este artigo tem como objetivo apresentar uma padronização da técnica de irrigação transanal terapêutica, uma técnica antiga que passou pela história e tem sido utilizada como procedimento médico para auxiliar no tratamento de distúrbios de defecação.

#### Palavras-chave:

Traumatismos da medula espinhal

Incontinência fecal

\* Corresponding author.

E-mail: [bdeoti@gmail.com](mailto:bdeoti@gmail.com) (B.D. Rodrigues).

<https://doi.org/10.1016/j.jcol.2018.08.243>

2237-9363/© 2018 Published by Elsevier Editora Ltda. on behalf of Sociedade Brasileira de Coloproctologia. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Constipação  
Qualidade de vida  
Estomas  
Irrigação terapêutica

**Métodos:** Este protocolo foi desenvolvido em pacientes com mielomeningocele submetidos à técnica de irrigação terapêutica transanal padrão, de acordo com o protocolo estabelecido na Clínica de Distúrbios da Defecação de um hospital universitário público no Brasil. A técnica padrão apresentada destaca os seguintes tópicos: preparação do paciente antes do tratamento; Abordagem interdisciplinar; treinamento do paciente ou do membro da família responsável pelo paciente e a técnica passo a passo em si. O comitê de ética em pesquisa da universidade aprovou este estudo.

**Discussão:** A irrigação transanal terapêutica está indicada nas disfunções intestinais neurológicas e nos distúrbios funcionais da defecação. O treinamento do paciente ou de um familiar responsável pela irrigação é realizado em três dias consecutivos, todos supervisionados por uma enfermeira. Esta técnica visa restabelecer o controle sobre a evacuação e a função intestinal, e consiste em uma infusão de água da torneira quente através do ânus, que permite ao paciente evacuar diariamente as fezes e manter o cólon vazio por períodos mais longos. Isso evita a incontinência fecal e aumenta a qualidade de vida dos pacientes com distúrbios de defecação.

**Conclusão:** A irrigação terapêutica transanal é um procedimento efetivo, bem tolerado e seguro, o qual é melhor quando comparado ao tratamento clínico padrão.

© 2018 Publicado por Elsevier Editora Ltda. em nome de Sociedade Brasileira de Coloproctologia. Este é um artigo Open Access sob uma licença CC BY-NC-ND (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## Introduction

The Transanal Therapeutic Irrigation (TTI), also known as retrograde colonic enema, is an old technique, used in rituals since 1500 before Christ. The method passed through the history as a detoxification method and then was perfected as a medical technique in 1987 to assist the treatments for defecation disorders. Since then, several studies have documented the efficacy and safety of the treatment in children and adults.<sup>1</sup> The idea is to keep the colon empty for longer periods to regain its propulsive ability and re-establish control over defecation.<sup>2</sup>

There are, currently, many options, from the use of cones to the latest devices from different companies. In the UK, the following systems are available for performing the TTI: Aquaflush (distributed by Bullen Healthcare), IryPump S (BBraun), Navina Systems (Wellspect Healthcare), Peristeen (Coloplast) and Qufora (MacGregor Healthcare Ltd).<sup>3</sup>

In Brazil there are no commercially available standard devices, so the aim of this study is to describe the technique of transanal therapeutic irrigation, using a colostomy irrigator for patients with defecation dysfunction in a research protocol approved by the Ethics Committee of Research of the Federal University of Minas Gerais (UFMG).

## Materials and methods

This protocol is recommended for patients with defecation dysfunction submitted to the standard transanal therapeutic irrigation technique at the Clinic of defecation disorders at Hospital of Clinics, UFMG.

### Indications

TTI is indicated in neurogenic bowel dysfunctions such as traumatic and genetic spinal cord injury, supraconal cauda

equina, spina bifida, multiple sclerosis and cerebral palsy. In functional disorders such as retentive or nonretentive fecal incontinence, chronic idiopathic constipation and slow transit rectal evacuation difficulty. In evacuations disorders caused by Hirschsprung disease, anorectal malformations and post-surgical situations such as LARS, ileoanal pouch dysfunction and others rectal cancer surgeries.<sup>3-9</sup> TTI is also a conservative substitute for the Malone antegrade continence enema procedure in children, which requires reconstructive bladder surgery.<sup>10</sup>

### Contraindications

Its necessary to evaluate the contraindications for the TTI method, in cases where it can be more harmful to the patient than the defecation dysfunction. The absolute contraindications are anal or rectal stenosis, active inflammatory bowel disease, acute diverticulitis, ischemic colitis, within three months of rectal or anal surgery or four to six weeks of hemorrhoid banding and known stricture, obstructing rectal or colonic mass. In addition, there are the relative contraindications, which will depend on patient particularities such as pregnancy, pelvic radiotherapy, fistulas or perianal abscess and bleeding disorders.<sup>3,5</sup>

### Technique

Before starting the TTI, there are steps including other more conservative methods, such as diet intake, alteration of lifestyle or oral medications and suppositories such as laxatives. If they fail, the best and less invasive alternative is the TTI.<sup>4,11</sup> Before the first irrigation the physician must confirm the actual indication of the procedure after medical and nursing consultations.

In addition, the patient must undergo training with an expert in the procedure to establish an individualized routine



**Fig. 1 – The regulator bag with the thermometer and the water flow controller device. The cone (white) is the part of the kit that fits in the anus.**

and documented consent of the patient and his parents must be procured.<sup>5</sup> It is basically an adaptation of the concept from colostomy irrigation.

Scheduled transanal irrigation aims to ensure the emptying of the left colon and rectum.

The equipment required is a transparent bag with graduation of volume with capacity of 2000 mL and a system with indication of temperature; a transparent plastic extender tube attached to a gripper for water flow control; a cone of malleable material with transparent extender tube of suitable diameter for fitting into the bag tube (Fig. 1).

The training period is conducted during three days. On the first day the stoma nurse presents the irrigation kit to the patient, she then gives a demonstration and performs the irrigation on the patient. On the second day, the patient will repeat the procedure with the help of the stoma nurse and on the third day the patient will do the procedure by himself, under supervision of the stoma nurse, in case of child patients the caregivers or the parents perform these steps.

#### First day

The irrigation device is presented to the patients, so they can handle it and clarify doubts regarding the procedure. Connecting the water storage bag to the cone assembles the equipment. The lowest volume necessary to achieve the desired effect should be used, starting from 10 mL/kg to 20 mL/kg with a maximum volume ranging from 1000 mL to 1500 mL.<sup>4</sup>

Heat the calculated amount of water to a maximum temperature of 37 °C. While the water heats up, the patient puts on a hospital gown and is taken to the bathroom where the procedure is going to be performed. When the water reaches the desired temperature, the patient is taught to test the temper-

ature on the back of the hand. When the water temperature is adequate, put the water in the bag and check the change in color that indicates the temperature in the bag.

We should add an extra 300 mL to the volume of water, 100 mL will be used to fill the tubes system and remove air bubbles and 200 mL to clean the rectal ampoule. After the system is filled, check if the total volume has decreased by 100 mL. Guide the patient to sit on the toilet in the position where the cervical spine angles 90° with the pelvis, with the feet fully resting on the floor. Position the bag at a height that is at most 30 cm above the patient's shoulder.

Ask the patient to touch the anal region to recognize the anatomy, using the index finger of the dominant hand. The gel is applied to the end of the cone and the patient is asked to insert the cone into the anal region with the dominant hand and the other hand will hold the tweezers system to control the flow of water. After this first irrigation, the nurse reintroduces the cone and initiates the procedure.

Set the start time of the procedure and infuse 200 mL to cover the maximum time of 1 min. After infusing 200 mL of water, the cone is removed and the patient is allowed to evacuate, releasing the first stool content present in the rectum. After the first evacuation, restart the process and infuse the remaining volume, in a maximum time of 3 min of infusion. At the end, leave the patient seated in the toilet at will, in a private setting, to finish the evacuation.

At the end of the evacuation guide ask the patient to make small walks to stimulate peristaltic movements and empty the bowel completely. Teach him to sanitize the material, with the washing of the cone only with neutral soap, dry and leave in dry environment until the next day of use. Schedule the patient's return for the next day.

#### Second day

Discuss the results with the patient and apply the protocol to evaluate the evolution after the first day of irrigation. Start the irrigation process, assisting the patient in assembling the kit, preparing the water, filling the system and introducing the cone. The other steps of the process will be identical to those of the first day.

#### Third day

On this day, the patient will respond to the same protocols of the second day of irrigation. Then he will do the whole procedure alone, under supervision. After completion of the procedure, the nurse will inform the patient about the importance of performing the procedure every day after breakfast; that he should reserve an average time of 1 h for the process avoiding leaving home in this period to ensure intestinal emptying at home; that he should make daily notes of the time that the irrigations took place and of possible leaks of feces or gases during the day. Returns are scheduled to apply the control protocols.

#### Complications

The most serious and potentially lethal likely complication is a bowel perforation that may occur from direct impaling trauma, over-inflation of the balloon (for device which has a balloon) or exaggerated hydrostatic pressure during water instillation. However, the perforation rate is not cumulative

and more likely to occur in the first few months of use.<sup>5,12</sup> The risk of perforation in the first eight weeks is about 6 per million, after that time the risk reduces to less than 2 per million increasing the benefit-risk ratio in support of the future use of TTI.<sup>13</sup>

Other possible troubles during the TTI are small bleedings, discomfort or mild abdominal or rectal pain, nausea, headaches, emotional distress, autonomic dysreflexia and other symptoms such as sweating, facial flushing, palpitations and dizziness, leakage of water, difficulty inserting catheter or cone, burst of balloon, irrigant is not expelled, no stool is evacuated after the procedure and fecal incontinence between irrigations.<sup>4,5,8</sup> Some patients can develop new anal fissures during therapy.<sup>14</sup> In fact, the conservative bowel management tended to have more common associated symptoms such as likes sweating, headaches, flushing or pronounced general discomfort than the TTI.<sup>8</sup> Also, there is a chance of electrolyte disturbance when laxatives are added to the irrigation water, something that needs to be addressed before it can be used as a standard procedure.<sup>2</sup>

### Quality of life

In case of patients with bowel dysfunctions, the quality of life is impaired not just in the physical status; also the psychosocial and professional aspects are directly and sorely affected. The TTI helps the patients to regain control of their bowel functions.<sup>3</sup> In case of neurological injuries, the quality of life decreases as nerve tissue damage increases. In fecal incontinence, the emptying of the left colon with an efficient TTI performance means that the stool does not reach the rectum for approximated two days. This way, the TTI prevent leakage between irrigations. Regarding constipation, the irrigation accelerates transit through the entire colon, promoting regular evacuation.<sup>5</sup> In addition, this method reduces the episodes of urinary tract infections and the risk of stoma surgery.<sup>1,11</sup>

Although the TTI only provides a state of pseudo-continenence, it enables the patient to choose the time of defecation and prevent fecal leaks and night bowel movement,<sup>15</sup> so it has been shown as a useful method to improve the quality of life in several current studies. Patients who continued the method improved their symptoms while the level of family and professional health care dependency were reduced.<sup>16</sup> TTI significantly relieve symptoms of constipation and fecal incontinence<sup>6</sup> leading to high parental satisfaction in pediatric patients.<sup>7</sup>

## Discussion

The method is effective in most part of cases and it is always necessary to consider the individual factors of each patient before its indication. Unique on the simplicity of the technique, it is a reversible and minimally invasive procedure that has to find its place in the treatment hierarchy. Scheduled transanal irrigation aims to ensure emptying of the left colon and rectum or the entire colon. This method prevents fecal leakage between washouts, providing a state of pseudo continence, and it re-establishes control over the time and place of defecation. A regular emptying of the distal bowel, furthermore, prevents constipation. It may take from four to twelve weeks to

establish a reliable and effective routine.<sup>5</sup> The patients themselves can perform the TTI easily. In children under 15 years of age their parents are also trained.<sup>5</sup> In the first two weeks, TTI should be performed daily, preferentially at the same time of the day, and then it can be reduced to alternate days.<sup>5</sup> In our institutional protocol we adopt a daily procedure. The studies suggest that the treatment may be effective in patients with 20 years of bowel disease as it is in others with a 6 month history.<sup>14</sup> The bowel irrigation provides statistically significant benefits compared to the conservative bowel treatment in constipation and fecal incontinence resulting in better satisfaction scores and diminishing the total time spent with bowel care daily.<sup>17</sup>

The idea is to keep the colon empty for longer periods. This way, by regularly emptying the bowel, TTI aims to re-establish the control of defecation by giving to the patient the opportunity to choose when he or she evacuates.<sup>5-8</sup>

For some patients, the TTI results in complete satisfaction and great improvement on their quality of life, but to others its has a poor efficacy.<sup>5</sup> Although the TTI only provides a state of pseudo-continenence, it enables the patient to choose the time of defecation and prevent fecal leaks and night bowel movement.<sup>15</sup> TTI is a cost-saving treatment strategy, which reduces the risk of stoma surgery in 35%,<sup>11</sup> the episodes of fecal incontinence in 65%,<sup>18</sup> the urinary tract infections in 29-54%<sup>11,16</sup> and the number of hospitalizations in 41%<sup>16</sup> leading to improvement on the quality of life for patients who have failed in conservative management.<sup>9</sup>

## Conclusion

TTI is an effective, well-tolerated and safe procedure.<sup>2,18</sup> It has been showed in the literature that the TTI is more efficient than conservative management the result of the treatment also depends on the correct performance and aspects related to patients psyche and motivation. The standardization of the technique allows its realization in a safe, more accessible way and treats a greater number of patients.

## Conflicts of interest

The authors declare no conflicts of interest.

## REFERENCES

1. Christensen P, Bazzocchi G, Coggrave M, Abel R, Hultling C, Krogh K, et al. A randomized, controlled trial of transanal irrigation versus conservative bowel management in spinal cord-injured patients. *Gastroenterology*. 2006;131:738-47.
2. Jørgensen CS, Kamperis K, Modin L, Rittig CS, Rittig S. Transanal irrigation is effective in functional fecal incontinence. *Eur J Pediatr*. 2017;176:731-6.
3. Wilson M. A review of transanal irrigation in adults. *Br J Nurs*. 2017;26:846-56.
4. Mosiello G, Marshall D, Rolle U, Crétolle C, Santacruz BG, Frischer J, et al. Consensus review of best practice of transanal irrigation in children. *J Pediatr Gastroenterol Nutr*. 2017;64:343-52.

5. Emmanuel AV, Krogh K, Bazzocchi G, Leroi AM, Bremers A, Leder D, et al. Members of working group on Trans Anal Irrigation from UK, Denmark, Italy, Germany, France and Netherlands. Consensus review of best practice of transanal irrigation in adults. *Spinal Cord*. 2013;51:732–8.
6. Juul T, Christensen P. Prospective evaluation of transanal irrigation for fecal incontinence and constipation. *Tech Coloproctol*. 2017;21:363–71.
7. Koppen IJ, Kuizenga-Wessel S, Voogt HW, Voskeuil ME, Benninga MA. Transanal irrigation in the treatment of children with intractable functional constipation. *J Pediatr Gastroenterol Nutr*. 2017;64:225–9.
8. Emmanuel A. Review of the efficacy and safety of transanal irrigation for neurogenic bowel dysfunction. *Spinal Cord*. 2010;48:664–73.
9. Nasher O, Hill RE, Peeraully R, Wright A, Singh SJ, Peristeen (@) transanal irrigation system for paediatric faecal incontinence: a single centre experience. *Int J Pediatr*. 2014;2014:954315.
10. Alenezi H, Alhazmi H, Trbay M, Khattab A, Neel KF. Peristeen anal irrigation as a substitute for the MACE procedure in children who are in need of reconstructive bladder surgery. *Can Urol Assoc J*. 2014;8:E12–5.
11. Emmanuel A, Kumar G, Christensen P, Mealing S, Størling ZM, Andersen F, et al. Long-term cost-effectiveness of transanal irrigation in patients with neurogenic bowel dysfunction. *PLOS ONE*. 2016;11:e0159394.
12. Memon S, Bissett IP. Rectal perforation following transanal irrigation. *ANZ J Surg*. 2014, <http://dx.doi.org/10.1111/ans.12761> [Epub ahead of print].
13. Christensen P, Krogh K, Perrouin-Verbe B, Leder D, Bazzocchi G, Petersen Jakobsen B, et al. Global audit on bowel perforations related to transanal irrigation. *Tech Coloproctol*. 2016;20:109–15.
14. Etherson KJ, Minty I, Bain IM, Cundall J, Yiannakou Y. Transanal irrigation for refractory chronic idiopathic constipation: patients perceive a safe and effective therapy. *Gastroenterol Res Pract*. 2017:3826087.
15. Dulskas A, Smolskas E, Kildusiene I, Samalavicius NE. Treatment possibilities for low anterior resection syndrome: a review of the literature. *Int J Colorectal Dis*. 2018;33:251–60.
16. Passananti V, Wilton A, Preziosi G, Storrie JB, Emmanuel A. Long-term efficacy and safety of transanal irrigation in multiple sclerosis. *Neurogastroenterol Motil*. 2016;28:1349–55.
17. Coggrave M, Norton C, Cody JD. Management of faecal incontinence and constipation in adults with central neurological diseases. *Cochrane Database Syst Rev*. 2014:CD002115.
18. Krogh K, Chiarioni G, Whitehead W. Management of chronic constipation in adults. *United Eur Gastroenterol J*. 2017;5:465–72.