

Physiotherapeutic Treatment of Urinary Incontinence after Radical Prostatectomy: Case Study

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Abstract— Apply the protocol of perineal exercises in urinary incontinence after radical prostatectomy for prostate cancer. Unique, descriptive and exploratory case study, of a quantitative and qualitative nature. Held in a host institution in the southwest of Bahia on cancer patients. Participant, 63 years old, diagnosed with prostate cancer, undergoing radiation therapy, prostatectomized for 3 years with urinary incontinence. Data analysis was performed using the Statistical Package for Social Sciences - Version 22.0. The research resulted in a decrease in daily urinary frequency (from 14 to 6) and the amount of diapers used weekly (from 14 to 3). In the PERFECT scheme there was an increase in the phases: P = from 3 to 4; E = from 4 to 10; R = from 4 to 10; F = from 3 to 10. In the Stop-Test there was progress in the score of muscular functionality from 3 to 5. In the Pad-Test there was a reduction in the difference in urinary loss from 4 grams to 1 gram. Conclusion: The application of the protocol and the physical therapy follow-up carried out in the present study showed positive results in increasing the strength and resistance of the pelvic floor muscle contraction, consequently, the return of urinary continence, which were confirmed at the end of therapy.

Keywords— Prostate cancer. Urinary incontinence. Pelvic floor. Muscle strength.

I. INTRODUCTION

According to the Oncoguia Institute [1], prostate cancer has become the second largest type of cancer among men, behind only non-melanoma skin cancer, and considering both sexes, it is the fourth most common type. As for mortality, this cancer is the second leading cause of death among this public, followed only by lung cancer.

The National Cancer Institute [2] estimated 68,220 diagnoses of new cases in Brazil in 2018, that is, 66.12 new cases per 100,000 men, while in the United States, according to the American Cancer Society [3], it would be about 164,690 new cases and about 29,430 deaths from prostate cancer.

The early stage of prostate cancer may not show symptoms, however, in an advanced stage, some symptoms are common: difficulty in urinating and / or the need to urinate more often during the day and night; pain to urinate and / or ejaculate; presence of blood in the urine or semen. These symptoms can also occur in benign prostatic hyperplasia (BPH) [4].

Prostate cancer is curable and includes treatments with chemotherapy, radiotherapy, surgery and physiotherapy. Radical prostatectomy is the surgery that removes the prostate, however, some complications can be seen such as: retrograde ejaculation, sexual impotence, and urinary incontinence (UI), which trigger social and psychological consequences with great influence on the quality of life of

the patient. patient. UI is the most common finding in prostatectomized patients, which may be temporary or persistent requiring pharmacological treatment and / or surgical procedures and physiotherapeutic treatment [5,6].

Within the scope of physiotherapeutic treatment, there are several techniques used for post-prostatectomy UI, such as kinesiotherapy, biofeedback and electro-stimulation whose objective is to re-educate and strengthen the pelvic floor muscles (MAP) in order to recover the urine continence, thus allowing the process of urination. urination voluntarily [7,8].

The choice of the theme arose from the high rates of prostatectomized men who are affected by urinary incontinence and their relationship with little knowledge about the contribution of physiotherapy in resuming the functionality of the problem in question.

Therefore, research and application of protocols become necessary in the realization of physical therapy plans that will serve of great importance, by contributing to the scientific community and other people with the knowledge that this study seeks to acquire.

Therefore, the question arose about "how effective are physical therapy interventions in the treatment of urinary incontinence in prostatectomized men?" The general objective of the study was to apply the protocol of perineal exercises in urinary incontinence after radical prostatectomy for prostate cancer. The specific objectives were: to assess the muscular function of the pelvic floor; quantify the loss of urine in activities of daily living; to analyze the individual's perception after applying the protocol.

II. MATERIALS AND METHODS

This is a single case study, classified according to the objectives in descriptive and exploratory, of a quantitative nature.

The study was carried out in a host institution in a municipality in the southwest of Bahia for patients with oncological diseases, who were referred informally from surrounding cities with no financial means to stay in the city during treatment. This provides accommodation, food and basic nursing care for patients.

Participant 63 years old, 1.71 meters tall, married, farmer, weighing 93 kilos, diagnosed with prostate cancer, is in the fifth session of radiotherapy. According to his report, he underwent radical prostatectomy in 2016 (3 years ago) and soon afterwards he presented urinary incontinence persisting to the present day.

After signing the Informed Consent Form (ICF) by the participant, a semi-structured assessment form was used that detailed the participant's status, the history of the disease, the triggering symptoms of urine loss, urinary frequency, medications in use, sex life, fluid intake routine and bowel habits and physical activity.

In the evaluation of the muscular function of the pelvic floor, the PERFECT scheme and the Stop-Test were used. The PERFECT scheme verifies in 5 phases the functionality of the pelvic floor muscles using digital rectal touch and voice commands to request the desired actions: 1) "P" (Power) checks the strength of muscle contraction using the modified Oxford scale of 0 a 4 (0 = a without contraction and 4 = maximum force lasting more than five seconds); 2) "E" (hardens) checks the resistance through the contraction sustaining time, with the maximum time evaluated being 10 seconds; 3) "R" (Repetitions) checks repetitions of sustained contractions for 5 seconds with a 4-second rest interval between contractions, counting up to 10 repetitions; 4) "F" (Fast) checks the speed of the contractions maintained for 1 second each, counting up to 10 contractions; 5) "ECT" (Every Contractions Timed) verifies which accessory muscles are activated when the MAP is contracted [9].

The Stop-Test consists of interrupting urination 1 to 2 times from the individual after 5 seconds of starting it and thus grading what happened in Grade 0, it is unable to interrupt the stream of urine; Grade 1, manages to partially interrupt the jet, but cannot maintain the interruption; Grade 2, manages to partially interrupt the jet, and maintains the interruption for a short time; Grade 3, manages to totally interrupt the jet, maintaining the interruption but with weak muscle tone; Grade 4, manages to totally interrupt the jet, maintaining the interruption with good muscle tone; and Grade 5, manages to completely interrupt the jet, maintaining the interruption with strong muscle tone [10]. It is worth mentioning that this test should be done only as an evaluation marker and not as a way to strengthen the pelvic floor muscles.

To quantify the loss of urine in activities of daily living, an absorbent test (Pad-Test) was performed, in which a geriatric absorbent was used to measure its weight before starting the test by an electronic scale (model SF-400). The participant must drink a liter of water in a period of fifteen minutes, rest for another thirty minutes. Then, perform a circuit of activities, such as walking, running, going up and down steps, squatting, repeated changes of positioning and decubitus, lifting objects from the floor and going down, coughing repeatedly and washing your hands under running water. At the end of the sequence, the absorbent is weighed and the difference, in grams, between the initial

and final weight classifies urinary loss. When the difference is up to 2 grams, it is dry; from 2 to 10 grams, slight loss; 10 to 50 grams, moderate loss and severe loss when the difference exceeds 50 grams [11].

A protocol of perineal exercises was performed (Fig. 1) which consists of muscle training of the pelvic floor associated with functional exercises of the lower limbs, confirming 10 physiotherapy sessions performed twice a week for 5 weeks, with about 50 minutes each session, with weekly progression of interventions.

Interventions	
First Week (awareness)	<ul style="list-style-type: none"> • Supine: 5 quick contractions; 10 contractions sustained for 3 seconds with the same relaxation time; 5 quick contractions. • Exercises to sit and stand, cough, pick up objects on the floor, go up and down steps *.
Second week	<ul style="list-style-type: none"> • Supine: 10 quick contractions; 15 sustained contractions of 5 seconds with the same relaxation time; 10 quick contractions. • Dissociation of the pelvic girdle in supine with the lower limbs supported by the therapist. • Bridge exercises by pressing a ball between the lower limbs *. • Supine hip abduction exercises with resistance from a wither between the limbs *. • Semi squat with your back against the wall *. • Pelvic anteversion and retroversion exercise in orthostasis *.
Third week	<ul style="list-style-type: none"> • Supine: 20 rapid contractions, 30 sustained contractions for 10 seconds with the same relaxation time, repeating another 20 rapid contractions. • Dissociation of the pelvic girdle in supine with the lower limbs supported by the therapist. • Bridge exercises by pressing a ball between the lower limbs *. • Supine hip abduction exercises with resistance from a wither between the limbs *. • One-leg bridge exercise with elevated contralateral limb *. • Semi squat with your back against the wall *.

	<ul style="list-style-type: none"> • Pelvic anteversion and retroversion exercise in orthostasis *.
Fourth week	<ul style="list-style-type: none"> • Supine: 30 rapid contractions, 40 sustained contractions for 10 seconds with the same relaxation time, repeating another 30 rapid contractions. • Dissociation of the pelvic girdle in supine with the lower limbs supported by the therapist. • Bridge exercises by pressing a ball between the lower limbs *. • Supine hip abduction exercises with resistance from a wither between the limbs *. • One-leg bridge exercises with elevated contralateral limb *. • Free squat *. • Pelvic anteversion and retroversion exercise in orthostasis *.
Fifth week	<ul style="list-style-type: none"> • Supine: 40 rapid contractions, 50 sustained contractions for 10 seconds with the same relaxation time, repeating another 40 rapid contractions. • Dissociation of the pelvic girdle in supine with the lower limbs supported by the therapist. • Bridge exercises by pressing a ball between the lower limbs *. • Supine hip abduction exercises with resistance from a wither between the limbs *. • One-leg bridge exercises with elevated contralateral limb *. • Free squat *. • Side gait associated with semi squat and resistance of a wither between the limbs *. • Pelvic anteversion and retroversion exercise in orthostasis *.

Fig. 1. Perineal exercise protocol for urinary incontinence.

* requested the contraction of the pelvic floor by the researcher in each repetition and associated with breathing.

A semi-structured questionnaire was applied through an interview with seven questions regarding the participant's perception in relation to his status before and after the protocol.

For data analysis, the program SPSS (Statistical Package for Social Sciences) Statistic Base - Version 22.0 was used for simple descriptive analysis, with relative and

percentage values, as it is a platform that brings security and reliability.

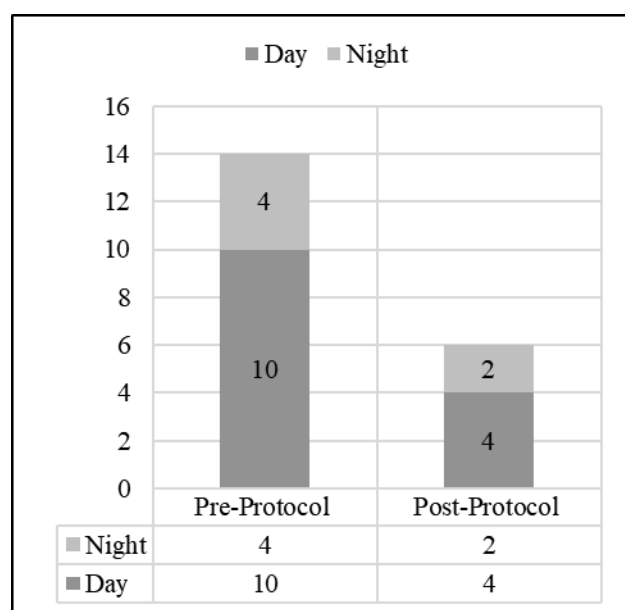
This study was submitted to the Comissão Nacional de Ética em Pesquisa (CONEP) of Plataforma Brasil and approved by the Comitê de Ética em Pesquisa (CEP) of the Fundação Pública de Saúde de Vitória da Conquista (FSVC) under protocol number 3.304.113.

III. RESULTS

In the pre-protocol physical therapy assessment, the participant reported continuous urine loss when coughing, sneezing, going up and down stairs, walking and carrying weight. He declared that he had evacuation control with a frequency of once a day, however he has an inactive sex life, due to difficulty in erection since the prostatectomy. In her routine she makes daily intake of coffee, fruits and spicy foods. Does not practice physical activities. He reported being hypertensive, but uses hypotensive drugs, Anlodipine, Losartan and Hydrochlorothiazide. Regarding water intake, consumption was one glass a day after lunch, after guidelines, it started to have a minimum consumption of 2 liters daily.

Graph 1 illustrates reports of pre- and post-protocol urinary frequency whose findings were: pre-protocol = 10 times a day and 4 times at night; post protocol = 4 times a day and 2 times at night.

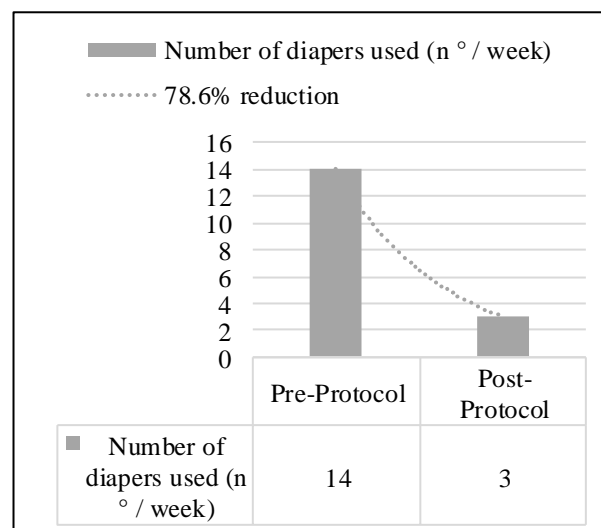
Graph 1. Evaluation of urinary frequency according to the participant's reports before and after the protocol.



Graph 2 shows the number of diapers used weekly by the participant before and after the protocol, whose quantities were: pre-protocol = 14 per week (2 a day); post protocol = 3 per week, corresponding to a reduction of 78.6%.

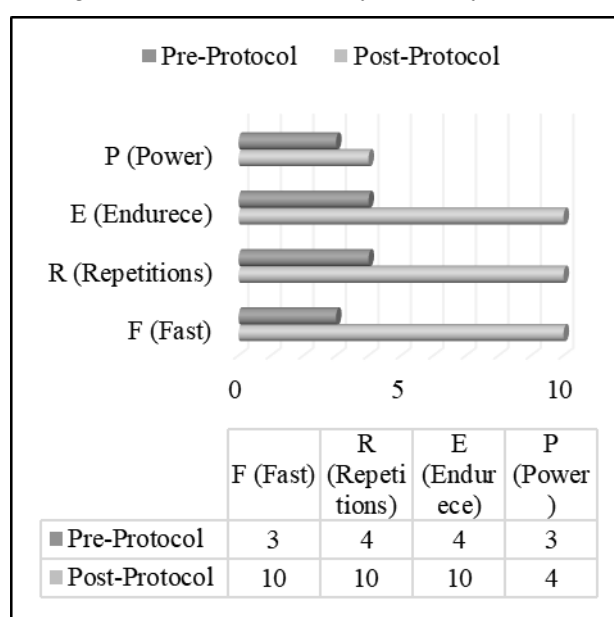
protocol = 3 per week, corresponding to a reduction of 78.6%.

Graph 2. Evaluation of the number of diapers used by the participant's reports before and after the protocol.



Graph 3 shows the evaluation of the muscle function of the pelvic floor using the PERFECT scheme whose pre-protocol values were: P = 3, E = 4, R = 4, F = 3. After the protocol, progress was made which reached the maximum score of the scores in all phases evaluated with the values of P = 4, E = 10, R = 10, F = 10.

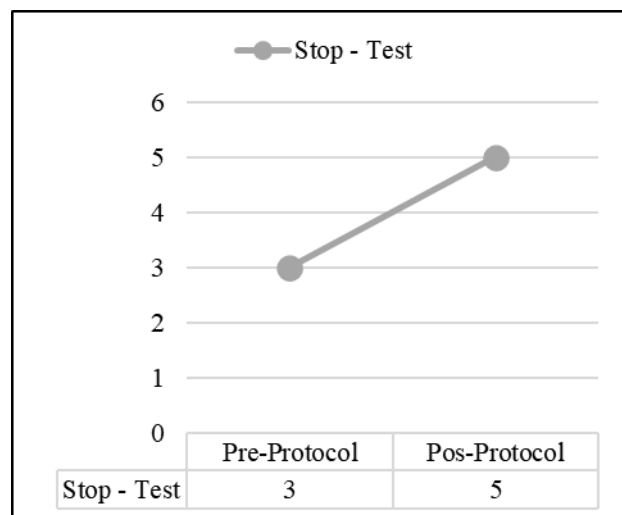
Graph 3. Evaluation of the pelvic floor muscle function using the PERFECT scheme before and after treatment.



In the evaluation of the muscular function of the pelvic floor by the Stop-Test (Graph 4), it showed a score of 3

before the intervention, which made it progress in a score of 5 after the protocol.

Graph 4. Evaluation of the muscular function of the pelvic floor by the Stop-Test before and after the protocol.



In assessing the loss of urine by the Pad-Test (Graph 5), it was possible to quantify a difference in the weighing of the absorbent of 4 grams before the protocol, indicating a slight loss. After the protocol, the quantification of the test indicated a difference of 1 gram, indicating the dry absorbent.

Graph 5. Assessment of urinary loss using the Pad-Test before and after the protocol.

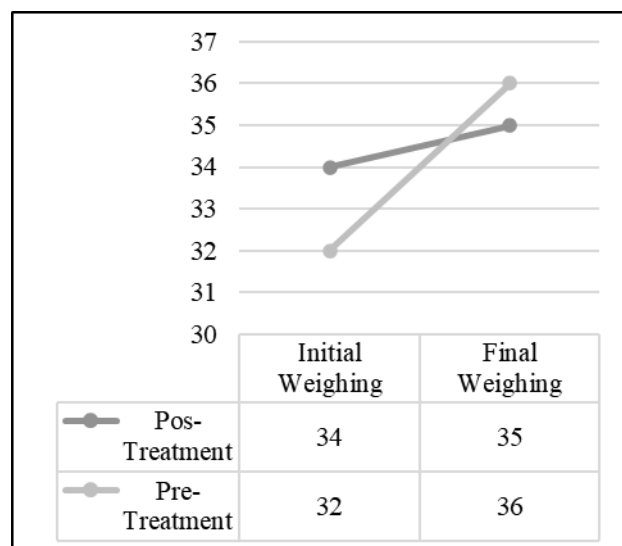


Fig. 2 depicts the participant's responses about his perception in his pre- and post-treatment state, which occurred within three weeks after the end of the protocol, by telephone, in which adjustments were made in the conjugation of the verbs.

1- How did you feel about your urinary incontinence before physical therapy?

"I felt uncomfortable because I couldn't 'thing', 'right' ... it was just with the urine coming out, 'right' ... I almost didn't stop, pissed a lot ... I went on the street and leaked too much."

2- How did urinary incontinence affect your life in daily activities?

"It bothered me because I couldn't stay on the street for a long time, I had to go and come back quickly or the diaper would fill ... even to work I couldn't work ... and to get down and get weight ... just like the person who works picking up heavy stuff, I kept 'drawing' straight, every time I had to go out for a replacement or I would overfill it."

3- How do you feel today, after the physiotherapeutic treatment of urinary incontinence?

"Today I am feeling better because I go out on the street and I go with nothing ... I go everywhere today (...)."

4- Regarding the number of diapers, how many have you used?

"I stopped using."

5- About your sex life, how would you describe your erection today?

"It has improved a little, but it is not normal ... it is still weak (...) it 'improved'."

6- What did you understand about the role of physiotherapy as a treatment for urinary incontinence?

"I had never heard of it ... I had heard of it, but I thought it was something else (...) 'business' for people who have an arm problem, a leg problem, who used physiotherapy to 'do something'. it was like that for me, 'right', but just like I did, I never thought."

7- From 0 to 10, how much did the physical therapy performed contribute to your improvement?

"I think it's 10 saw ... contributed 100% ... or saw more ... because the way I was, I couldn't even leave because I was scared."

Fig. 2. Replies of the semi-structured questionnaire to determine the participant's perception in his pre- and post-treatment state.

IV. DISCUSSION

Prostatectomy is among the main surgical procedures that develop urinary incontinence [12]. In a retrospective

multicenter clinical study by Mascle et al. [13] in patients with postoperative urinary incontinence treated with suburethral strips in a population of 76 participants, found that 85.5% of the patients had radical prostatectomy as a source of urinary incontinence.

Lima et al. [14] state that the physical therapy modalities used to treat urinary incontinence, in addition to increasing the strength of perineal contraction and decreasing urinary loss, increase the interval between urination and, consequently, the reduction in urinary frequency.

Hsu et al. [6], claim that radical prostatectomy causes damage to the urinary continence mechanism of the internal sphincter. Sphincter insufficiency and detrusor overactivity are considered the main causes of urinary incontinence.

Sayılan and Özbaş [8] conducted a study in two groups for 6 months after radical prostatectomy to determine the effect of pelvic floor muscle training on 60 participants with incontinence problems. The experimental group showed a highly significant reduction in relation to the number of diapers used in the first month, with 36.7% using 4 to 6 per week, while in the control group 56.7% used at least 5 per day. By the sixth month, 50% of the participants in the experimental group reported having stopped using the diaper, while in the control group 30% used 3 to 4 per day.

Hsu et al. [6] states that pelvic floor muscle training promotes increased muscle strength and endurance, improving urinary incontinence by tightening the urethra and increasing intra-urethral pressure when intra-abdominal pressure increases.

Santos et al. [12], carried out a bibliographic review based on controlled clinical trials in which physiotherapeutic techniques for strengthening the pelvic floor muscles were used for treatment in the perioperative period of radical prostatectomy. The study demonstrated that several approaches and samples showed promising results in minimizing postoperative urinary incontinence, mainly accelerating recovery and healing or decreasing symptoms.

A bibliographic search by Fernández et al. [15], to evaluate the evidence of the effect of pelvic floor muscle training on urinary incontinence after radical prostatectomy, concluded that a pelvic floor training program with three series executions, including 10 repetitions performed daily, may be sufficient to improve the continence rate.

According to Lin et al. [16], in the experimental study on the effects of early muscle exercise on the pelvic floor for sexual dysfunction in radical prostatectomy recipients, many men develop sexual dysfunction in response to erectile dysfunction, being present in 25% to 97% of patients who underwent radical prostatectomy, however the training demonstrated that pelvic floor exercises can strengthen the external sphincter and improve urinary incontinence and sexual dysfunction.

Park et al. [17], in his prospective study in two groups to evaluate the effectiveness of resistance training for post-prostatectomy urinary incontinence, observed that the strength and resistance changes of the hip muscles were significantly greater in the continent group of the lower limbs, than in the incontinent group, revealing that the change in strength and resistance of these muscles may be related to obtaining urinary continence.

V. CONCLUSION

The application of the perineal exercise protocol and the physical therapy follow-up carried out in the present study showed positive results in increasing the strength and resistance of the pelvic floor muscle contraction, consequently, the return of urinary continence, which were confirmed at the end of therapy.

It was possible to verify that the muscular training of the pelvic floor associated with the functional exercises of the lower limbs promoted a reduction in the signs and symptoms of the participant, observed by the reduction of the urinary frequency and cessation of the diapers used, with repercussions in the promotion of well-being by reporting his perception to the patient. treatment. However, sexual function did not show satisfactory results, thus assuming a more targeted approach.

Knowing that the high number of prostate cancer will lead to urinary incontinence in prostatectomized individuals, it is important to monitor and treat by the physiotherapist as early as possible, considering that the problem in question impacts on public health.

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