

# Impact of treatment with sling placement for stress urinary incontinence on quality of life: case report and literature review

Impacto do tratamento com colocação de *sling* para incontinência urinária na qualidade de vida: relato de caso e revisão da literatura

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## Abstract

**Introduction:** urinary incontinence is defined as a condition of involuntary leakage of urine. Although minimal, incontinence is associated with a significant decline in quality of life, social, professional and mental health, as well as sexual dysfunction in these women. **Objective:** to report the impact of sling use on the long-term quality of life of a patient with stress urinary incontinence. **Case Report:** 37-year-old patient without comorbidities, five pregnancies, three natural deliveries, one cesarean section and one abortion, with an interval between deliveries of approximately one year. She began to experience mild urinary incontinence at medium and heavy exertion (cycling, climbing stairs quickly, carrying weight) or in near-maximum bladder capacity, in drips, with progressive worsening of symptoms over time that negatively impacted her quality of life. After several outpatient evaluations and with the persistence of symptoms, the patient underwent insertion of a mid-urethral sling. **Conclusion:** the use of a urethral sling had a positive impact on the control of incontinence and improvement in the long-term quality of life of a young patient with stress urinary incontinence.

**Keywords:** Quality of life, Urinary incontinence, Suburethral slings

## Resumo

**Introdução:** a incontinência urinária é definida como uma condição de perda involuntária de urina. Ainda que seja mínima, a incontinência está associada a um declínio significativo na qualidade de vida, na vida social, profissional e na saúde mental, bem como na disfunção sexual dessas mulheres. **Objetivo:** relatar o impacto da utilização do *sling* na qualidade de vida a longo prazo de uma paciente com incontinência urinária de esforço. **Relato do Caso:** paciente de 37 anos sem comorbidades, cinco gestações, três partos naturais, uma cesárea e um aborto, com intervalo entre os partos de aproximadamente um ano. Começou a apresentar incontinência urinária leve aos médios e grandes esforços (andar de bicicleta, subir escadas rapidamente, carregar peso) ou na capacidade vesical próxima da máxima, em pingos, com piora progressiva dos sintomas ao longo do tempo que impactavam negativamente a qualidade de vida. Após as diversas avaliações ambulatoriais e com a persistência de sintomas a paciente foi submetida a inserção de um *sling* de uretra média. **Conclusão:** a utilização de *sling* uretral impactou positivamente no controle da incontinência e melhora da qualidade de vida a longo prazo de uma paciente jovem com incontinência urinária de esforço.

**Palavras Chave:** Qualidade de vida, Incontinência urinária, Slings suburetrais

## Introduction

Urinary incontinence (UI) is defined as a condition of involuntary leakage of urine<sup>(1)</sup>, with the three most common types being: (1) stress urinary incontinence (SUI), characterized by an inadvertent leakage of urine occurring as a result of increased intra-abdominal pressure, due to physical exertion, such as coughing or sneezing; (2) urge urinary incontinence (UUI), characterized by involuntary leakage of urine for no apparent reason and associated with urgency; (3)

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mixed urinary incontinence (MUI), characterized by the combination of SUI and UUI<sup>(2)</sup>.

Due to its high prevalence (approximately 46% of adult women), UI has a direct and negative impact on the quality of life (QOL) of these women<sup>(3-4)</sup>. Although minimal, incontinence is associated with a significant decline in QOL<sup>(5)</sup>. In addition to a negative impact on overall QOL, SUI is also associated with a negative impact on social, professional and mental health, as well as on the sexual dysfunction of these women<sup>(6-7)</sup>.

The main treatment options for SUI include muscle training exercises aimed at restoring pelvic floor muscle strength and tone, and estrogen therapy<sup>(8)</sup>. In a systematic review with meta-analyses, Dumoulin et al<sup>(9)</sup> included 31 clinical trials involving 1,817 women in 14 different countries. The authors showed that the group of women treated with pelvic floor muscle training showed better results in symptoms and quality of life, when compared to those who did not undergo any treatment.

Despite the interesting results related to muscle training for the management of SUI, some women require invasive treatments, and the most common surgical option is mid-urethral sling surgery with retropubic tension-free vaginal mesh tape. Ford et al<sup>(10)</sup> conducted a systematic review that included 81 clinical trials with 12,113 women with the objective of evaluating the clinical effects of using a sling for the treatment of SUI. The authors showed that, regardless of the surgical technique used for sling placement (transobturator or retropubic), there is evidence that the cure rate is very good and has a positive impact on the quality of life and sexual health of women with SUI in the short term (up to one year).

Accordingly, the objective of this study was to report the impact of sling use on the long-term quality of life of a patient with stress urinary incontinence.

## Case Report

Patient D.S.C.B. female, 37 years old, born in Belém/PA, residing in Santo Antônio do Descoberto/GO, BMI: 24.1 kg/m<sup>2</sup>, without comorbidities, five pregnancies, three natural deliveries, one cesarean section and one abortion, with an interval between births of approximately one year. She reported irregular menstruation and, during the cesarean delivery, she underwent surgical tubal ligation. In 2011, she began to have mild urinary incontinence at medium and heavy exertion (cycling, climbing stairs quickly, carrying weight) or in near-maximum bladder capacity, in drips. There was a progressive worsening of symptoms when, in February 2017, she sought the urology outpatient clinic, complaining of SUI on minor exertion (coughing, laughing, sneezing) in jets of urine,

getting to the point of wetting her legs and clothes, with the need to change approximately 5-6 pads/day. The patient reported frequent and uncomfortable nocturnal enuresis, in addition to sporadic nocturia (0-1x). Although the daytime frequency was slightly excessive, approximately 6-8 times a day, she denied symptoms of urinary urgency. Other symptoms reported were "heaviness in the vagina" during the menstrual period and recurrent urinary infections (~3 times a year) that affected her for one year before the procedure and in the year after the surgical procedure. She also reports that the problem caused her a lot of embarrassment and limited her participation in social events, making her unwilling to leave the house.

During 18 months of outpatient follow-up, she underwent three urodynamic studies (UDS) that did not show any changes. During this period, she underwent 20 physical therapy sessions to strengthen the pelvic floor, with two weekly sessions of 40 minutes each, where she also used transcutaneous electrical nerve stimulation (TENS) therapy. Despite the treatment with physical therapy and despite the normal UDS, the patient had persistent symptoms.

After several evaluations and with the persistence of symptoms, the patient was informed about the option of inserting a mid-urethral sling, when she accepted it (in August 2018). In technical terms, a longitudinal infra-urethral incision of approximately 1 cm was performed on the anterior wall of the vagina, with dissection of the para-urethral space bilaterally. Another incision of approximately 0.5 cm in the topography of the obturator foramen bilaterally, with introduction of the transobturator sling (DynaMesh) up to the para-urethral space (outside-in). The procedure was completed with the placement of a polypropylene mesh, with its accommodation in the middle urethra, without tension.

In the first postoperative review, two weeks after the surgical procedure, the patient reported the absence of incontinence, even after great exertion. The improvement in the emotional well-being and quality of life of this patient was significant. The patient returned to the outpatient clinic after three years of follow-up in December 2021 (at 37 years of age) still reporting absence of SUI and/or UUI, even when subjected to a variety of situations that require exertion. In order to evaluate quality of life, the King's Health Questionnaire (KHQ) was applied, translated and validated in Brazil<sup>(11)</sup> to evaluate the quality of life of women with urinary incontinence. The questionnaire was applied with information before and after the procedure. It can be seen that there was a significant improvement in the scores for all the KHQ domains, when comparing the moments before (2018) and after sling placement (2021), whose results can be seen in Table 1.

**Table 1**

Analysis of the quality of life of the patient D.S.C.B according to the King's Health Questionnaire.

KHQ Domains	Score	
	Prior to surgery (2018)	Currently (2021)
General health perception	100%	0%
Impact of Incontinence	100%	0%
Limitations on task performance	100%	0%
Physical limitation	100%	0%
Social limitation	33.3%	0%
Personal relationships	83.3%	33.3%
Emotions	55.5%	0%
Sleep/Energy	66.6%	0%
Severity measurements	83.3%	0%

**Caption:** KHQ - King's Health Questionnaire

KHQ is composed of 21 questions, divided into the following domains: general health perception, impact of urinary incontinence, limitations of daily activities, physical limitations, social limitations, personal relationships, emotions, sleep/mood. In addition to these domains, there are two other independent scales: one evaluates the severity of urinary incontinence (severity measurements) and the other evaluates the presence and intensity of urinary symptoms (urinary symptoms scale). The KHQ scales are Likert-type and graded in four response options ("not at all, a little, moderately, a lot" or "never, sometimes, often, all the time"), with the exception of the domains "general health perception" ("very good, good, regular, bad, very bad") and "personal relationships" ("not applicable, not at all, a little, moderately and a lot"), which have five response options. KHQ is scored for each of its domains, so there is no overall score. The scores range from 0 to 100 and the higher the obtained score, the worse the quality of life related to that domain.

This study has case report design, and was conducted in the city of Brasilia, according to resolution 466/12, of the National Health Council, after approval by the Research Ethics Committee of the Hospital das Armadas do Distrito Federal, under # 5,379,450 and CAAE: 56955722.7.0000.0025.

## Discussion and literature review

This case report showed that the use of a urethral sling in a 33-year-old female patient with SUI and approximately 18 months of follow-up, had an

impact on objective cure, evaluated by the absence of symptoms, and subjective cure, evaluated by measuring the quality of life by the King's Health Questionnaire, both investigated three years after the procedure. For the patient in the case, it was chosen to place a transobturator sling even though the last UDS had not changed.

The accomplishment of UDS before the surgical procedure is currently under discussion around the world in the field of urology and gynecology, where some authors have evaluated its role nowadays<sup>(12-13)</sup>. Two randomized clinical trials with the objective of evaluating whether the UDS prior to surgery had a positive impact on surgical outcomes in patients with SUI showed no objective or subjective differences in patients undergoing simple clinical evaluations versus patients undergoing UDS<sup>(14-15)</sup>.

In an observational study that evaluated 132 patients with SUI, Ayati et al<sup>(16)</sup> compared the findings of the urodynamic study with the clinical variables of these patients. The authors showed that the UDS variables do not correlate with the symptoms and clinical findings of the patients. Despite a relatively high sensitivity, the specificity of the urodynamic evaluation was low and of limited value in the evaluation of SUI in female patients without a clear history of neurological disorders. Regarding the low sensitivity and specificity of UDS for the patient in the presented case, the probable explanation is the fact that she had a less severe SUI and had no clear history of neurological disorders.

Historically, sling treatment has been reserved for women with severe and/or recurrent urinary incontinence<sup>(17)</sup>. Nevertheless, since the late 1990s, the use of this device has been advocated for the treatment of women with all types of incontinence (simple or complicated)<sup>(18-19)</sup>. In recent years, sling implantation has emerged as the most commonly performed procedure in women with SUI<sup>(20)</sup>.

The implantation of a sling is the most common type of surgery for the treatment of SUI in women around the world, being considered by many authors as the gold standard in these cases. Much controversy, however, has evolved regarding the safety of this type of sling<sup>(21)</sup>. In general, the quality of studies concerning the evaluation of risks of sling-associated complications is generally very poor<sup>(20)</sup>. The most common risks in patients with slings include urethral obstruction, requiring surgery<sup>(22)</sup>; vaginal, bladder and/or urethral erosion, requiring surgical correction<sup>(23)</sup>; and refractory chronic pain<sup>(23)</sup>; these data probably represent the minimal risks. In addition, at least one third of patients undergoing sling excision surgery develop a recurrence of SUI. Considering the additional risks of refractory overactive bladder,

fistulas and intestinal perforations, among others, the overall risk of a negative outcome after the sling implantation surgery is approximately 15%<sup>(20)</sup>.

Surgical treatment for sling placement in SUI is strictly elective to improve QOL, but may be associated with potential long-term problems, such as vaginal extrusion in up to 5% and recurrence of SUI in 9% of patients<sup>(24)</sup>. Accordingly, it is essential to evaluate the long-term outcomes of this procedure. Both the International Urogynecologic Association (IUGA) and the International Continence Society (ICS) recommend the use of objective and subjective measures, such as the evaluation of QOL as outcomes in clinical trials.

In order to perform the evaluation of quality of life, it was chosen to use the King's Health Questionnaire in this case report. In the evaluation referring to the moment before the surgical procedure, the domains "general health perception", "impact of incontinence", "limitation on task performance" and "physical limitation" had the worst scores (100%). With the exception of the domain "social limitation", the other domains also presented scores above 50%, denoting a worse quality of life. Three years after sling placement, the same questionnaire showed significant improvement in all the KHQ domains (Table 1). Despite presenting the case of a single patient who underwent sling placement, other authors presented results from observational studies<sup>(24)</sup> and randomized clinical trials<sup>(25)</sup> where the reported procedure was also related to improved quality of life, sexual health and patient satisfaction.

The patient in the reported case, despite being young and without comorbidities, has a history of multiparity. Clinical and demographic characteristics, lifestyle habits, comorbidities and obstetric characteristics, such as the number of pregnancies, can be considered as important risk factors for UI<sup>(26-27)</sup>.

A systematic review with meta-analysis conducted by Zhou et.al.<sup>(28)</sup> evaluated the causality between multiparity and UI. In a meta-regression analysis, which included cohort and case-control studies, the authors showed that, compared to nullity, each pregnancy increases the risk for general urinary incontinence by approximately 13% (OR=1.13, 95% CI: 1.05-1.22), especially in women with a number of pregnancies  $\geq 2$ . The conclusions of these authors suggest that parity was associated with increased risk of global and stress UI, but not urge UI. Nonetheless, these results should be interpreted with caution and other high-quality cohort studies should be performed to confirm the findings.

Some cross-sectional studies have suggested an association between multiparity and a higher prevalence of UI<sup>(26, 29-30)</sup>. In addition, other review

studies have suggested pregnancy and childbirth as risk factors for SUI<sup>(31-32)</sup>. Nonetheless, due to the limitation of cross-sectional studies, current evidence can only support a potential association between multiparity and urinary incontinence, but not a causal link<sup>(33)</sup>. Thus, it is unclear whether multiparity causes urinary incontinence or whether urinary incontinence is an effect of multiparity.

Urinary incontinence is a problem associated with multiple mechanisms, but hyperactivity and poor bladder control, as well as compromised pelvic floor muscles, were highlighted as direct causes of UI<sup>(34)</sup>. These problems are attributed to stretching of the pelvic floor muscles and damage to connective tissue during labor, compromising the normal function of urinary continence<sup>(31)</sup>. Nonetheless, this also depends a lot on the type of delivery. In some studies, cesarean delivery was not associated with the risk of UI<sup>(35-36)</sup>.

The main limitation of this study is related to the used method, considering that case report studies have limited conclusions due to the small number of participants evaluated and the inability to establish a causal relationship, consequently strong scientific evidence.

One perspective of this study is the recommendation for the systematic incorporation of instruments to evaluate quality of life, such as the King's Health Questionnaire, in the outpatient clinic where the research was developed. Furthermore, the long-term follow-up of patients monitored at the service should be carried out with the objective of evaluating the quality of life, reducing symptoms and possible complications related to the procedure.

## Conclusion

In this study, it was possible to demonstrate that the use of a urethral sling had a positive impact on the control of incontinence and on the improvement of the long-term quality of life of a young patient with SUI.

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### Authors' Contributions:

**Marcos Alccio Bispo de Andrade:** Data Collection, Conceptualization, Resource Management, Project Management, Investigation, Methodology, Writing - Original Preparation, Writing - Review and Editing, Supervision, Validation, Visualization.

**Jos Carlos de Almeida:** Validation, Visualization.

**Marcelo Vieira:** Validation, Visualization.

**Eduesley Santana-Santos:** Conceptualization, Project Management, Methodology, Writing - Original Preparation, Writing - Review and Editing, Supervision, Validation, Visualization.

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