

# Impact of body mass index on midurethral retropubic mesh for stress urinary incontinence

## Abstract

This study aims to elucidate the influence of body mass index (BMI) on the success of midurethral retropubic mesh placement for stress urinary incontinence (SUI). Examining data of 116 patients from Hospital El Carmen-Maipu Chile, comprising 89.6% overweight or obese individuals, our study reveals an overall success rate of 93.9% at the three-month postoperative assessment. There was no substantial difference in surgical success between patients with normal weight and those classified as overweight or obese. Furthermore, BMI demonstrated no significant correlation with the success or failure of midurethral retropubic mesh placement. The findings suggest that BMI is not a determining factor in the success of midurethral retropubic mesh surgery for SUI in this Chilean cohort at the three-month follow-up. The robust success rate aligns with global literature, underscoring the efficacy of this intervention across BMI categories.

**Keywords:** stress urinary incontinence, midurethral retropubic mesh, tvt, body mass index, Chilean population

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## Introduction

Urinary incontinence, defined as the complaint of involuntary loss of urine, affects 25 to 75% of women in their lifetime. Stress urinary incontinence (SUI) is a subtype of involuntary urine loss associated with valsalva. Risk factors for its development include parity, route of delivery, age, obesity, family history and medical comorbidities.<sup>1,2</sup> The goal of treatment is to improve the quality of life of patients, initially it includes lifestyle changes, pelvic floor exercises and bladder training. Those who do not respond adequately are candidates for surgical treatment. Surgical treatment is currently based on suburethral mesh placement, where the retropubic approach (TVT-R) is considered the gold standard with a success rate of 89.1%.<sup>3</sup>

Obese women are 3 to 4 times more likely to develop urinary incontinence compared to normal weight women; however, this does not appear to be a risk factor for failure for surgical treatment.<sup>4-6</sup> Reports from United States and Europe indicate that obesity and overweight do not affect the success rate or complications arising from the placement of TVT-R.<sup>7,8</sup> The 2016-2017 Chilean national health survey accounts for 73.2% overweight and obesity, with a higher rate in women than in men.<sup>9</sup> Given the high prevalence of malnutrition due to excess in the population, an increase in the incidence of SUI is expected. As a result, it is uncertain how this might affect the rate of improvement in incontinence following the insertion of suburethral mesh. Due there is no evidence about this topic in Chile or Latin America, the success rate of TVT-R was studied in individuals with normal weight and overweight/obesity.

## Methods

An observational retrospective study was performed. Data from 116 patients undergoing midurethral retropubic mesh placement at El Carmen Hospital in Maipú-Santiago between 2017 and 2019 were analyzed retrospectively, and the Incontinence Severity Index (ISI) before surgery was compared 3 months after. We consider surgery

failure to any leakage at 3 months after surgery. No new data was obtained after 2019 due the incontinence procedures were cancelled because COVID-19 outbreak. Weight and height were measured to calculate the Body Mass Index (BMI) at the time of surgery and patients were classified into normal weight (BMI<25) or overweight and obese (BMI>25). Exclusion criteria were patients undergoing concomitant prolapse surgery and who had a previous incontinence surgery. Risk factors such as age, parity and history of operative delivery were analyzed. Continuous variables are presented by mean and SD. For association between data, Fisher exact test was used. The prognostic of successful of TVT-R was explored using logistic regression model. Stata v.18 was used for statistical calculation.

## Results

Of the total of patients undergoing TVT-R, 89.6% (n = 104) corresponded to overweight or obese and the remaining 10.4% (n = 12) were patients with normal weight. Overall BMI was 30.5 (SD ± 0.5; 95% CI 29.5-31.5). Normal weight group has an overall BMI of 22.2 (SD ± 1.2) and was 31.4 (SD ± 4.9) for the overweight/obese group. Comparing by BMI <25 and >25 both groups have similar characteristics in terms of age (57.4 ± SD 8.1 and 61.4 ± SD 9.9, respectively) and parity (2.4 ± SD 0.9 and 2.2 ± SD 1.0, respectively). No operative delivery was found in the normal weight group (Table 1). The overall success rate of the surgery at 3 months was 93.9% (n = 109) and 6.1% (n= 7) of the patients presented some type of urine leakage. All patients with urinary loss at 3 months were overweight or obese. Both groups have similar rates of success at 3 months after surgery measured by ISI Sandvik index (0.1 ± SD 0.5 and 0.2 ± SD 1.0, respectively). No correlation was found between BMI at the time of the surgery with the success or failure rate comparing normal weight and overweight/obese group (*p-value*: 0.377). Logistic regression does not show correlation between BMI and successful of TVT-R at 3 months after surgery (SE 0.01, *p*=0.54 95% CI: -0.02 – 0.04) Table 2.

**Table 1** Demographic characteristics

	Normal weight (12)	Overweight/Obese (104)
Age <sup>a</sup>	57.4 (± 8.1)	61.4 (± 9.9)
Parity <sup>b</sup>	2.4 (± 0.9)	2.2 (± 1.0)
Operative delivery	0	2
BMI	22.2 (± 1.2)	31.4 (± 4.9)
Sandvik		
Sandvik pre	8.9 (± 3.5)	9.6 (± 2.3)
Sandvik 3m	0.1 (± 0.5)	0.2 (± 1.0)

Main demographic characteristics of cases and controls. These are expressed in numbers and standard deviation.

<sup>a</sup>mean age expressed in years; <sup>b</sup>mean parity; standard deviation; Sandvik pre: Sandvik index before surgery; Sandvik 3m: Sandvik index 3 months after surgery.

**Table 2** Logistic regression for risk factors and successful rate of TVT-R

	Confidence interval	p-value
Age	-0.297 – 0.007	0.25
Parity	-0.349 – 0.011	0.06
Operative delivery	-0.773 – 0.085	0.78
BMI	-0.023 – 0.044	0.54

Main demographic characteristics of patients and logistic regression.

Main demographic characteristics of cases and controls. These are expressed in numbers and standard deviation.

<sup>a</sup>: mean age expressed in years; <sup>b</sup>: mean parity; ± standard deviation; Sandvik pre: Sandvik index before surgery; Sandvik 3m: Sandvik index 3 months after surgery.

## Discussion

Urinary incontinence, defined as the involuntary loss of urine, most frequently affects patients with obesity, and given the increasing prevalence of overweight and obesity in our population, urinary incontinence is a pathology that compromises the quality of life of a significant percentage of our population. Although it is true that the reduction of BMI is associated with a decrease in the severity of stress urinary incontinence (SUI) symptoms, patients are limited when trying to lose weight because physical activity is precisely a triggering factor of SUI symptoms, so surgical treatment, specifically retropubic suburethral mesh, is the best management alternative for these patients.

In our study, no differences were seen in the success of surgery 3 months after the procedure, even though the great majority of the patients evaluated were overweight or obese. Unfortunately, the number of women with normal weight was very low, reflecting the high prevalence of overweight and obesity in the Chilean population at present. Thus, the comparison of groups may be underestimated. Finally, the follow-up was three months and we

believe it would be interesting to know how many patients persist at one or two years after surgery to evaluate if the BMI factor compromises the medium or long term success of this treatment.

## Conclusion

In our sample, the placement of midurethral retropubic mesh for SUI treatment has a clinical successful rate of 93.9% of cases at 3 months. No association was found between the rate of surgery failure and overweight or obesity, which is consistent with international literature. Further studies with a greater number of patients could help to better analyze the relationship between the success rate of TVT-R, BMI and other risk factors.

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## Conflicts of interest

The authors declare do not have conflicts of interest.

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