Int J Clin Exp Med 2016;9(3):6751-6757
www.ijcem.com /ISSN:1940-5901/IJCEM0018436

Original Article

The assessment of mid-urethral sling on the sexual function of patient's spouse using a new self-administered questionnaire

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Received October 24, 2015; Accepted January 21, 2016; Epub March 15, 2016; Published March 30, 2016

Abstract: The aim of the study is to investigate the impact of mid-urethral sling (MUS) on the sexual function of stress urinary incontinence (SUI) patient's spouses. We enrolled 32 sexually active couples from the database of 283 SUI patients underwent MUS. The couples were further stratified by pre-operative leakage during sex, sling material and surgical approach. For data acquisition from the male part, we designed a non-validated questionnaire adapted from previous questionnaire and named it as Incontinence Patient's Spouse Sexual Questionnaire (IPSSQ-12) to investigate sexual function of the SUI patient's spouse. The IPSSQ score, IPSSQ score change (ΔIPSSQ) and the sexual improvement rate were indexes to compare the pre- and post-operative functions of different groups. The post-operative IPSSQ score was significantly higher than pre-operative score (32.4±7.7 vs. 20.2±4.7, P=0.0075). Increase of score occurred both in the behavioral/emotive domain and the physical domain with statistical significance (P<0.0001), but not in the partner-related domain. The mean value of ΔIPSSQ was statistically higher in the leakage group than non-leakage group (15.2±0.7 vs. 11.4±3.4, P=0.0018). When stratified by sling material and surgical approach, no significant improvement was found. Whereas physical domain score of the delayed-absorbable sling group was significantly higher than two non-absorbable groups. MUS showed in general positive impacts on the sexual function of SUI patient's spouses. Our results might be helpful for urologists to carry out pre-operative psychosexual counseling for SUI couples.

Keywords: Male, questionnaires, sexual behavior, suburethral slings, urinary incontinence

Introduction

Stress urinary incontinence (SUI) is the most common non-fatal pelvic-floor dysfunctional disease in adult women [1, 2]. For SUI patients, psychological impairment and deterioration of one's quality of life (QOL) could be more harmful than urinary disorders [3-5]. Comorbidities such as female sexual dysfunction (FSD) could be seen in over 50% SUI patients [6, 7]. Factors that cause FSD include: vaginal relaxation and genital prolapse, fear of sex due to leakage and loss of attraction due to unpleasant odor and wet pad [8]. As the golden standard in the surgical treatment of SUI, mid-urethral sling (MUS) procedure brings positive impacts on patient's post-operative quality of life [9]. In published reports studying sling surgery and sexual life quality, female SUI patients are absolutely the major respondents [10]. Obviously, their spouses (or partners) who are actually the dominant part in sexual activity have been over-neglected. To our knowledge, there is currently no self-administered questionnaire specially designed for the investigation of partner's sexual function including the well-known "Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire" (PISQ-12) [11]. In the present study, we designed a non-validated condition-specific questionnaire adapted from PISQ-12, and named it as Incontinence Patient's Spouse Sexual Questionnaire (IPSSQ-12). We used IPSSQ-12 to investigate the impact of MUS on the sexual function of SUI patient's spouses.

Materials and methods

Recruitment of sex-active couples

Families participating in the present survey were recruited from a database of 283 SUI patients who underwent MUS procedure at the Department of Urology of Huadong Hospital affiliated to Fudan University from January,

Table 1. Characteristics of qualified sex-active couples

Range of patient's age	36-52 year
Range of spouse's age	36-62 year
Mean time to resume sex	98±7 days
Pre-operative leakage during sex	Patient No.
Yes	19
No	13
Sling material	Patient No.
PP	12
PVDF	12
TS-05	8
Surgical approach	Patient No.
TVT	12
TOT/TVT-O	20

TVT: tension- free vaginal tape; TVT-O: tension-free vaginal tape-obturator; TOT: trans-obturator tape. PP: Polypropylene and PVDF: Polyvinylidene Fluoride were two non-absorbable slings; TS-05: the product code of a delayed-absorbable sling.

2008 to December, 2014. The institutional review board waived the need for signing consent form, because the questionnaire was anonymous. After each family returned the voluntary commitment letter, the couples initially completed a screening form, which included a self-reporting of sexual activity. A total of 32 couples stated that they still had sex at least once within the last three months. They were then informed to complete an additional PISQ-12 form (for SUI patient) and a non-validated sexual questionnaire IPSSQ-12 (for patient's spouse) designed by our department. The questionnaires and an instruction letter were all in Chinese and were mailed to the participants. Eventually, none of them failed to complete questionnaires.

Among the qualified couples, the patient's age was 36-52 year; their spouse's age was 36-62 year. The mean time to resume sexual life after the sling procedure was 98±7 days. We then stratified them according to pre-operative leakage during sex, sling material and surgical approach. The surgical approaches included retro-pubic approach (TVT: tension-free vaginal tape) and trans-obturator approach (TVT-O: tension-free vaginal tape-obturator or TOT: trans-obturator tape). The sling materials included two non-absorbable slings (PP: Polypropylene, Gynecare® and PVDF: Polyvinylidene Fluoride, DynaMesh®) and a delayed-absorbable sling (TS-05, Herniamesh®). The characteristics of qualified sex-active couples were shown in **Table 1**.

Questionnaire and scoring system

The IPSSQ-12 was a self-designed questionnaire based on PISQ-12 and consultation conclusions with urogynecologists and andriatric clinicians in our hospital. The total 12 questions were labeled as three domains: behavioral/emotive, physical, and partner-related. Each domain had four questions. The behavioral/emotive domain contained questions 1, 2, 11 and 12; physical domain contained questions 7-10 and partner-related domain contained questions 3-6. Each question was scaled from 0 (choice 1) to 4 (choice 5) (see **Appendix**). After institutional review board approval, IPSSQ-12 was the only questionnaire to measure sexual function of the patient's spouse. Total IPSSQ score was calculated by totaling the score for each question.

Data processing and statistical analysis

The total IPSSQ score and the score of each domain were expressed as mean ± standard error of mean (s.e.m). IPSSQ score change (ΔIPSSQ) is calculated as the value of post-operative IPSSQ score minus pre-operative score and expressed as mean ± s.e.m. The sexual improvement rate is the percentage of patient's spouse whose total IPSSQ increased after surgery. The IBM SPSS for Windows version 21.0 computer software was used for data management and statistical analysis. Comparisons of preoperative and postoperative IPSSQ score and ΔIPSSQ between two groups were performed using the two-sample t-test or Wilcoxon rank sum test. For the comparison of ΔIPSSQ between three groups, data were analyzed using one-way ANOVA followed by Student-Newman-Keuls multiple comparisons test as post test. The comparisons of sexual improvement rate were performed using the Chi-square test or Fisher's exact test. P values <0.05 were considered statistically significant.

Results

The pre- and post-operative IPSSQ score of SUI patient's spouse

The total post-operative IPSSQ score was significantly higher than pre-operative score (32.4±7.7 vs. 20.2±4.7, $P=0.0075$). Increase of

Table 2. Changes of IPSSQ score in all and each domain of the patient's spouse at baseline and after MUS surgery (n=32)

	Pre-operative	*Post-operative*	*P values*
All domains	20.2±4.7	32.4±7.7	0.0075
Behavioral/Emotive domain	10.8±0.7	5.5±0.6	<0.0001
Partner-Related domain	2.9±1.2	10.1±3.0	<0.0001
Physical domain	11.7±2.8	11.5±3.1	0.7874

The values are presented as mean ± standard error of mean (s.e.m).

Table 3. Comparison of ΔIPSSQ in all and each domain stratified by pre-operative leakage during sexual activity

	Leakage (n=19)	*Non-leakage (n=13)*	*P value*
All domains	15.2±0.7	11.4±3.4	0.0018
Behavioral/Emotive domain	5.5±6.6	4.8±0.7	0.7074
Partner-Related domain	8.9±5.2	6.0±2.2	0.0081
Physical domain	0.7±0.6	-1.1±3.8	0.0684

ΔIPSSQ is calculated as the value of post-operative IPSSQ score minus pre-operative score and expressed as mean ± s.e.m.

Table 4. Comparison of the sexual improvement rate and the ΔIPSSQ in all and each domain stratified by surgical approach

	TVT (n=12)	*TOT/TVT-O (n=20)*	*P value*
Sexual improvement rate	75%	80%	1.0000
ΔIPSSQ			
All domains	11.7±2.0	12.4±1.1	0.2094
Behavioral/Emotive domain	5.1±1.6	5.5±2.0	0.5879
Partner-Related domain	8.1±1.3	7.7±1.2	0.3831
Physical domain	0.7±0.1	0.3±1.2	0.2614

The sexual improvement rate is the percentage of patient's spouse whose total IPSSQ increased after surgery. TVT: tension- free vaginal tape; TOT: trans-obturator tape. TVT-O: tension-free vaginal tape-obturator.

score occurred both in the behavioral/emotive domain (10.8±0.7 vs. 5.5±0.6) and the physical domain (10.1±3.0 vs. 2.9±1.2) with statistical significance (*P<0.0001*), but not in the partner-related domain (**Table 2**).

The impact of pre-operative leakage during sex on post-operative sexual function

The mean value of ΔIPSSQ in the leakage group was statistically higher than non-leakage group (15.2±0.7 vs. 11.4±3.4, *P=0.0018*). Significant increase of ΔIPSSQ was found in the partner-Related domain (8.9±5.2 vs. 6.0±2.2, *P=0.0081*) but not in the behavioral/emotive and the physical domains (**Table 3**).

The impact of surgical approach on post-operative sexual function

The sexual improvement rate was found 75% (9/12) and 80% (16/20) in TVT and TOT/TVT-O groups respectively, whereas the mean values of ΔIPSSQ in two groups were 11.7±2.0 and 12.4±1.1. However, no significant difference in the sexual improvement rate was shown between the two groups, and neither was the ΔIPSSQ (**Table 4**).

The impact of sling material on post-operative sexual activity

Stratified by sling material, 32 men were subdivided into three groups (two non-absorbable groups PP and PVDF, a delayed-absorbable group TS-05). Both sexual improvement rates and ΔIPSSQ scores in three groups were very similar and had no significant difference, whereas the physical domain score in TS-05 group was significantly higher than the other two (PP and PVDF) (*P<0.001*) (**Table 5**).

Discussion

Sexual dysfunction is prevalent in urinary incontinence (UI) women, affecting nearly 50% of the patients [12, 13]. Severity of UI may play an important impact factor as the women who avoid sexual activity have higher 'incontinence pad weights' than those who do not [14]. Negative impacts of UI on sexual life include embarrassment, low desire, and arousal difficulty, leakage during intercourse and dysphonia [15].

MUS is the tension free trans-vaginal tape procedure which supports the mid-urethra and reduces SUI [16]. So far, MUS has been practiced worldwide and overall 90% objective success rate has been confirmed by different SUI guidelines [17]. In this perspective, successful MUS may give rise to a positive effect as some studies reported improved function. However, others reported conflicting results with deterio-

Table 5. Comparison of the sexual improvement rate and the ΔIPSSQ in all and each domain stratified by sling material

	Non-absorbable sling		*Delayed-absorbable sling*	
	PP (n=12)	*PVDF (n=12)*	*TS-05 (n=8)*	*P value*
Sexual improvement rate	83.3%	75%	75%	0.8587
ΔIPSSQ				
All domains	10.7±2.7	11.1±1.1	11.2±0.7	0.8004
Behavioral/ Emotive domain	5.1±1.6	5.9±2.0	4.9±2.6	0.4914
Partner-Related domain	8.0±1.3	7.6±1.2	7.0±2.1	0.3575
Physical domain	-2.7±0.1	-2.5±0.2	2.5±0.6§	<0.0001*

PP: Polypropylene; PVDF: Polyvinylidene Fluoride; TS-05: the product code of a delayed-absorbable sling. *Comparison of ΔIPSSQ between three groups, §Comparison of ΔIPSSQ with other two groups, *P<0.001*.

ration or no change, which were speculated by mesh erosion, pain during coitus and de novo urgency [12, 13, 18]. Thus, the impact of MUS on FSD remains controversial.

In common sense, male usually plays the dominant role in sexual activity. Partners of the UI patients have statistically significantly diminished sexual function with less satisfaction, lower frequency of intercourse and more erectile dysfunction [19]. The effect of MUS on the partner's sexual function has never been investigated except one recent study [20]. However, in this study the assessment was accomplished using the International Index of Erectile Function (IIEF-5) questionnaires, which narrowly focused on penile rigidity rather than emotional and functional changes in sexual activity.

We noticed that PISQ was a validated questionnaire internationally accepted for evaluating sexual function of women with UI and pelvic prolapse. The Chinese version of PISQ had already been validated [21]. Obviously, PISQ was not designed for their partners. The current available questionnaire for patient's spouse or partner sexual function evaluation is only generic sexual questionnaire such as IIEF-5.

In the present study, we used a non-validated self-administered questionnaire called IPSSQ-12. It was adapted from PISQ-12, which also reserved 3 domains: Behavioral/Emotive, Physical, and Partner-Related. But it was designed specially for SUI patient's spouse or partner. The scoring system was identical to PISQ-12. We thought it was suitable to use IPSSQ-12 together with PISQ-12 for each part of the couple; therefore score of each domain from both parts could be parallel compared. To our knowledge, it was the first time that the effect of MUS on the partner's sexual function had been assessed using a disease-specific self-administered questionnaire. Although it was a non-validated questionnaire, its structure and main contents basically followed PISQ-12. We believe that the results from the present study are reliable.

Our study showed the sexual function of the SUI patient's spouse was significantly improved in general, and was more obvious in those whom suffered from leakage during sexual intercourse pre-operatively. Scores in three domains indicated that such improvement mainly occurred in the behavioral/emotive domain (increased sexual desire and frequency of sex and decreased fear or depression of coital incontinence) rather than the physical domain. When stratified by sling material and surgical approach, no significant improvement was found post-operatively. Whereas the physical domain score in the group of central-absorbable sling (TS-05) was significantly higher than the other two non-absorbable groups (PP and PVDF), indicating that absorbable sling might lead to smaller or less scar tissue and consequently less incidence of dyspareunia secondary to the sensation of tape under the vaginal epithelium [22].

It should be noted that data from the SUI patients using PISQ-12 collected at the same time were not in consistency with their partners. Although the sexual improvement rate of the pre-operative leakage group was statistically higher than the non-leakage, the post-operative PISQ score had no significant increase. The emotive domain score was found even less than that of pre-operation time,

whereas no change occurred in both physical and partner domains (data not shown).

There were several major limitations in the present study: the self-designed IPSSQ-12 needs to be further validated, the sample size was relatively small, and the data had not been stratified by post-operative time.

Conclusions

MUS showed in general positive impacts on the sexual function of SUI patient's spouses. It was the first time that the partner had been surveyed using a disease-specific questionnaire. We believe that data acquisition derived from such questionnaire could provide information closer to the nature about sexual life of patient's partner than any generic questionnaire. Our results might be helpful for urologists to carry out pre-operative psychosexual counseling for the couples who are willing to undergo UI surgery.

Disclosure of conflict of interest

None.

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Appendix

Incontinence Patient Partner Sexual Questionnaire (IPPSQ-12)

Following is a list of questions about your sexual life. All information is strictly confidential and will only be used to help doctors understand your sexual life. Please tick the best answer of each question. While answering the questions, consider your sexuality during the past 6 months. Thank you for your help.

1. How frequently do you desire to have sexual intercourse?
□never □seldom □sometimes □usually □nearly daily

2. How frequently do you have sexual intercourse or activity?
□never □ < once/month □1~3/month □1~3/week □ once/day

3. Does your sexual interesting ever been interrupted by unpleasant urine odor from your partner?
□never □seldom □sometimes □usually □always

4. Is your partner incontinent of urine with sexual activity?
□never □seldom □sometimes □usually □always

5. Does your sexual activity been interrupted by your partner incontinent of urine?
□never □seldom □sometimes □usually □always

6. Does your partner's incontinent of urine affect your erection?
□never □seldom □sometimes □usually □always

7. Do you need lubrication help you insert?
□always □usually □sometimes □seldom □never

8. Does your sexual activity ever been interrupted by pains or discomforts during intercourse?
□always □usually □sometimes □seldom □never

9. Do you climax during sexual intercourse?
□never □seldom □sometimes □usually □always

10. How do you feel when you climax?
□bad □common □moderate □good □perfect

11. What's your overall feeling about your sexual activity?
□bad □common □moderate □good □perfect

12. What about your overall satisfaction of your sexual activity?
□bad □common □moderate □good □perfect

Scoring: Each question was scaled from 0 (choice 1) to 4 (choice 5). Total IPSSQ score was calculated by totaling the score for each question.