

# Nationwide Database of Surgical Treatment Pattern for Patients With Stress Urinary Incontinence in Korea

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**Purpose:** Nationwide database regarding stress urinary incontinence (SUI) is important for evaluating treatment patterns for SUI and for establishing appropriate national policies regarding SUI management. The purpose of this present study was to investigate surgical treatment patterns for women with SUI and analyze the current status of SUI management in Korea by using a nationwide database.

**Methods:** Data used for investigating the surgical trends and changes in Korea were retrieved from the Health Insurance Review & Assessment Service from 2008 to 2011.

**Results:** The number of surgical cases of SUI decreased continuously from 2008 to 2011. The proportion of transvaginal surgery using a midurethral sling increased continuously. Sling procedures were most commonly performed for women in their 40s followed by women in their 50s. Transvaginal surgery using a single sling or a readjustable sling was performed from 5.6% to 6.1%, which showed no significant change in the number of surgical cases.

**Conclusions:** There is a growing need for an appropriate national welfare policy and budget to care for aged and super-aged women in Korea. The early detection and intervention of silent SUI should be actively considered as an important preventive strategy to improve the quality of life in younger women.

**Keywords:** Stress urinary incontinence; Health insurance; Korea

## INTRODUCTION

Stress urinary incontinence (SUI) is one of the most common diseases among women in Korea. The treatment of SUI usually comprises of behavioral, medical, and surgical therapies. Physicians usually recommend surgery when patients continue to have SUI after nonoperative management (i.e., pelvic floor muscle training, vaginal support device, or anticholinergic agents) [1]. The surgical treatment of SUI has evolved rapidly and various

new surgical techniques have been introduced as a result [2]. The sling procedure has become the most common SUI surgery technique [3]. The sling procedure is commonly performed in Korea by physicians due to its simplicity and low morbidity rate.

The national health insurance system in Korea is different from other countries [4]. The healthcare system provides coverage to all people. Health care benefits include both primary and secondary care. Patients who are insured must receive primary care at a clinic, hospital, or general hospital before receiving

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Submitted: January 29, 2014 / Accepted after revision: March 3, 2014

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secondary care from a tertiary hospital. Specialists are usually accessible in primary care clinics in Korea due to the high proportion of specialists in each treatment specialty. The introduction of minimally invasive synthetic slings enabled physicians in clinics to perform more sling procedures for women with SUI over the past decade. Nationwide information regarding SUI is important for evaluating treatment patterns for SUI and establishing an appropriate national policy for the management of patients with SUI. However, nationwide data regarding treatment patterns of SUI procedures have not been previously analyzed.

In this study, we investigated surgical treatment patterns for women with SUI and analyzed the current status of SUI management in Korea using a nationwide database. This information will be helpful for formulating a new treatment policy related to SUI similar to that of other countries.

## MATERIALS AND METHODS

### Data Retrieval

Data of surgical cases related to SUI were retrieved from the Health Insurance Review & Assessment Service (HIRA) from 2008 to 2011. Physicians who perform SUI surgeries are required to report the appropriate surgical codes when they charge the HIRA for insurance costs. The codes related to SUI surgeries can be classified into 3 subgroups based on the sling procedure (R3561, R3564, and R3565), Burch operation (R3562), and injection procedure (R3563). All of these codes were included in the National Center for Health Statistics International Classification of Diseases, 9th revision. Prior to 2007, the R3561 code was used to specify all transvaginal surgeries; however, transvaginal surgeries were divided into the 3 subgroups (i.e., R3561, R3564, and R3565) in 2008. The codes

R3561, R3564, and R3565 are used to specify simple transvaginal surgeries without any autologous tissue or graft, with autologous fascia, and with a midurethral sling, respectively.

### Parameters and Statistical Analysis

We analyzed the number of surgical cases, the type of surgery performed according to the year of the surgery, the 10-year age groups, and the grade of hospital (i.e., clinic, hospital, and tertiary hospital). Cases of sling procedure were further analyzed according to sling materials. Sling materials consist of a conventional transobturator or transvaginal tape, a single incision sling in the vaginal wall, and a readjustable sling. Total medical expenses and the number of surgeries with local anesthesia were also investigated. This study was approved by the Institutional Review Board of Seoul National University Hospital (exempted). All statistical analyses were performed using SPSS ver. 14.0 (SPSS Inc., Chicago, IL, USA).

## RESULTS

The number of surgical cases decreased continuously from 2008 to 2011. However, the number of transvaginal surgeries using a midurethral sling (R3565) increased continuously. Only a few of the SUI surgeries involved the Burch operation and injection therapy (Table 1).

When we analyzed only the cases with a R3565 code cases according to the 10-year age group, the proportion of patients aged > 50 years increased continuously from 31.1% to 37.0% in the fifties, from 9.4% to 11.7% in their sixties, and from 2.5% to 3.4% in their seventies (Table 2). Sling procedures were performed most commonly for women in their 40s followed by women in their 50s. The total annual medical expense for women in their 40s and 50s were about fifteen to twenty billion

**Table 1.** The number of surgical cases according to the year of surgery

Procedure code	Year			
	2008 (n = 42,195)	2009 (n = 42,166)	2010 (n = 34,787)	2011 (n = 33,173)
Midurethral sling	41,169 (97.6)	41,265 (97.9)	33,928 (97.5)	32,399 (97.7)
R3561	295 (0.7)	34 (0.1)	4 (0.1)	6 (0.1)
R3564	1,358 (3.3)	547 (1.3)	231 (0.6)	227 (0.6)
R3565	39,516 (96.0)	40,684 (98.6)	33,693 (99.3)	32,166 (99.3)
R3562 (Burch)	103 (0.2)	47 (0.1)	29 (0.1)	66 (0.2)
R3563 (injection)	923 (2.2)	854 (2.0)	830 (2.4)	708 (2.1)

Values are presented as number (%).

**Table 2.** The number of surgical cases of transvaginal surgery using a midurethral sling (R3565) according to 10-year age group

Age (yr)	Year			
	2008 (n = 39,516)	2009 (n = 40,684)	2010 (n = 33,693)	2011 (n = 32,166)
30–39	4,516 (11.4)	4,006 (9.8)	2,843 (8.4)	2,552 (7.9)
40–49	17,934 (45.4)	18,324 (45.0)	14,146 (42.0)	12,769 (39.7)
50–59	12,291 (31.1)	13,401 (32.9)	11,967 (35.5)	11,905 (37.0)
60–69	3,718 (9.4)	3,872 (9.5)	3,616 (10.7)	3,751 (11.7)
70–79	994 (2.5)	1,012 (2.5)	1,020 (3.0)	1,092 (3.4)
≥80	63 (0.2)	69 (0.2)	101 (0.3)	97 (0.3)

Values are presented as number (%).

**Table 3.** Total medical expenses of sling procedures according to 10 year-age group

Age (yr)	Year			
	2008	2009	2010	2011
30–39	4,544,813	4,221,707	3,137,887	2,797,783
40–49	19,417,362	20,893,862	16,789,759	15,140,536
50–59	13,756,807	15,685,854	14,476,359	14,551,973
60–69	4,516,893	4,908,054	4,789,608	4,990,401
70–79	1,368,312	1,533,097	1,615,832	1,808,500
≥80	92,408	134,125	192,661	175,749
Total expenses	43,696,596	47,376,698	41,002,106	39,464,942

Values are presented as thousand Korean won.

Korean won (approximately 15 to 20 million USD) (Table 3).

Most of the women who had undergone sling procedures in tertiary hospitals were hospitalized for a single night after routine operation. However, the percentage of women who had undergone sling procedures at a day-surgery hospital or clinic center was > 85%.

Transvaginal surgery using a single sling or a readjustable sling was performed from 5.6% to 6.1%, which showed no significant change in the number of surgical cases (Table 4).

## DISCUSSION

SUI is a more common problem than we assume. The incidence of SUI seems to increase with age. SUI can cause detrimental social and hygienic problems that reduce the quality of life [5]. The effects of SUI on the health-related quality of life of patients have been established in previous investigations [6]. Various assessments of a patient's quality of life are available [5], which

**Table 4.** The number of surgical cases of transvaginal surgery using a single incision sling or a readjustable sling

Transvaginal surgery	Year			
	2008	2009	2010	2011
Surgical materials				
TVT-Sec, Miniarch, etc.	1,342 (3.2)	1,052 (2.5)	1,362 (3.9)	1,070 (3.2)
Remeex	1,018 (2.4)	1,423 (3.4)	1,012 (2.9)	953 (2.9)
Total	2,360 (5.6)	2,475 (5.9)	2,374 (6.8)	2,023 (6.1)

Values are presented as number (%).

mainly depend on the severity of the incontinence episodes and the social activity of the patients.

As shown in our findings, SUI is not merely an age-related process. The proportion of women in their 30s who needed surgical treatment for SUI was about 10%, which means that many factors are related to the occurrence of SUI. The average age of women diagnosed with SUI is gradually increasing, which has fueled a recent growing interest in research regarding SUI and health-related quality of life [5,6]. Therefore, necessary medical support is important for women with SUI who are willing to maintain their activities of daily living. As shown in this study, women with SUI in their 40s and 50s were more likely to undergo the surgical procedure compared to women in their 30s. We believe that SUI causes more detrimental effects on activities of daily living for middle-aged women, which is reflective of their desire to seek medical support. Therefore, proper education regarding SUI prevention and nonoperative management is also important. Since very few women with SUI seek medical support [7], the detection and early intervention of silent SUI should be actively considered as an important preventive strategy for improving patients' quality of life.

As mentioned previously, Korea has a unique healthcare system. Everyone, including foreign workers, can obtain social insurance, which consists of health insurance and medical aid. We were able to obtain very accurate data by using the nationwide database. As shown in the results of this study, women with SUI who were in their 40s and 50s were more likely to obtain medical support. South Korea is becoming an aging society [8] and therefore, troublesome SUI symptoms have prompted women in their 70s and 80s to actively seek medical support. Additionally, Korea is expected to have a super-aged population in several decades and the quality of life issue would be increasingly important in Korea in the future. We observed that total medical expenses increased for women in their 60s and 70s

(Table 3). Therefore, there is a growing need to prepare an appropriate national welfare policy and budget to prepare for an aging and a super-aged society.

There were several limitations to this study. Compared to a previous investigation [9], total medical costs decreased approximately 4 billion Korean Won. However, we were not able to determine the reasons for this decrease in medical expenses and therefore, it should be investigated in future studies. The cost of SUI treatment decreased in 2007, which may be associated with the raised HIRA standards for approving patients who prefer to undergo SUI surgery. However, total medical costs gradually decreased from 2007. We should consider medical costs [9], but also indirect costs of labor productivity loss. However, we could not evaluate the changes in medical expenses during the development of surgical techniques or medications. Furthermore, the present study only included data from the HIRA. Not all women with SUI have access to clinics or hospitals and we were not able to evaluate the relationship between noncovered insurance services and the types of medical institutions. Despite these limitations, the findings of this large-scale study provide reliable information for further investigation and enable public health authorities to develop nationwide policies for managing patients with SUI.

In conclusion, women in their 30s to 70s may have symptoms of SUI that reduce their quality of life. There is a growing need to prepare an appropriate national welfare policy and budget for the aging and super-aged women population in Korea. Furthermore, the detection and early intervention of silent SUI should be actively considered as an important preventive strategy for improving the quality of life in younger women.

## CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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