

# Non-invasive transcutaneous tibial nerve stimulation using the silver spike point for refractory urinary incontinence.

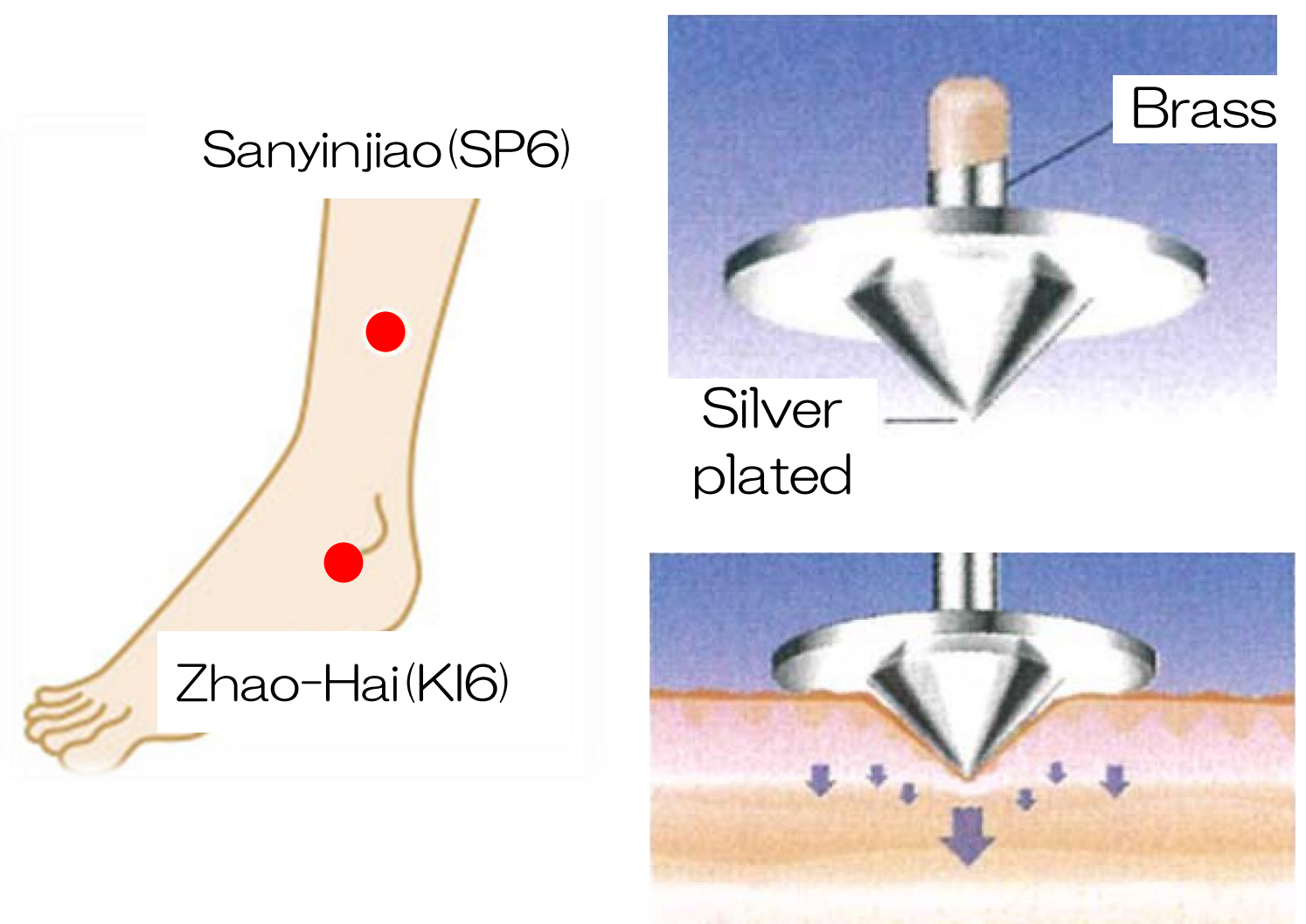
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**AIMS OF STUDY:** The aim of this study was to investigate the safety and efficacy of transcutaneous electrical posterior tibial nerve stimulation (TEPTNS) therapy using silver spike point (SSP) electrodes in refractory overactive bladder (OAB).

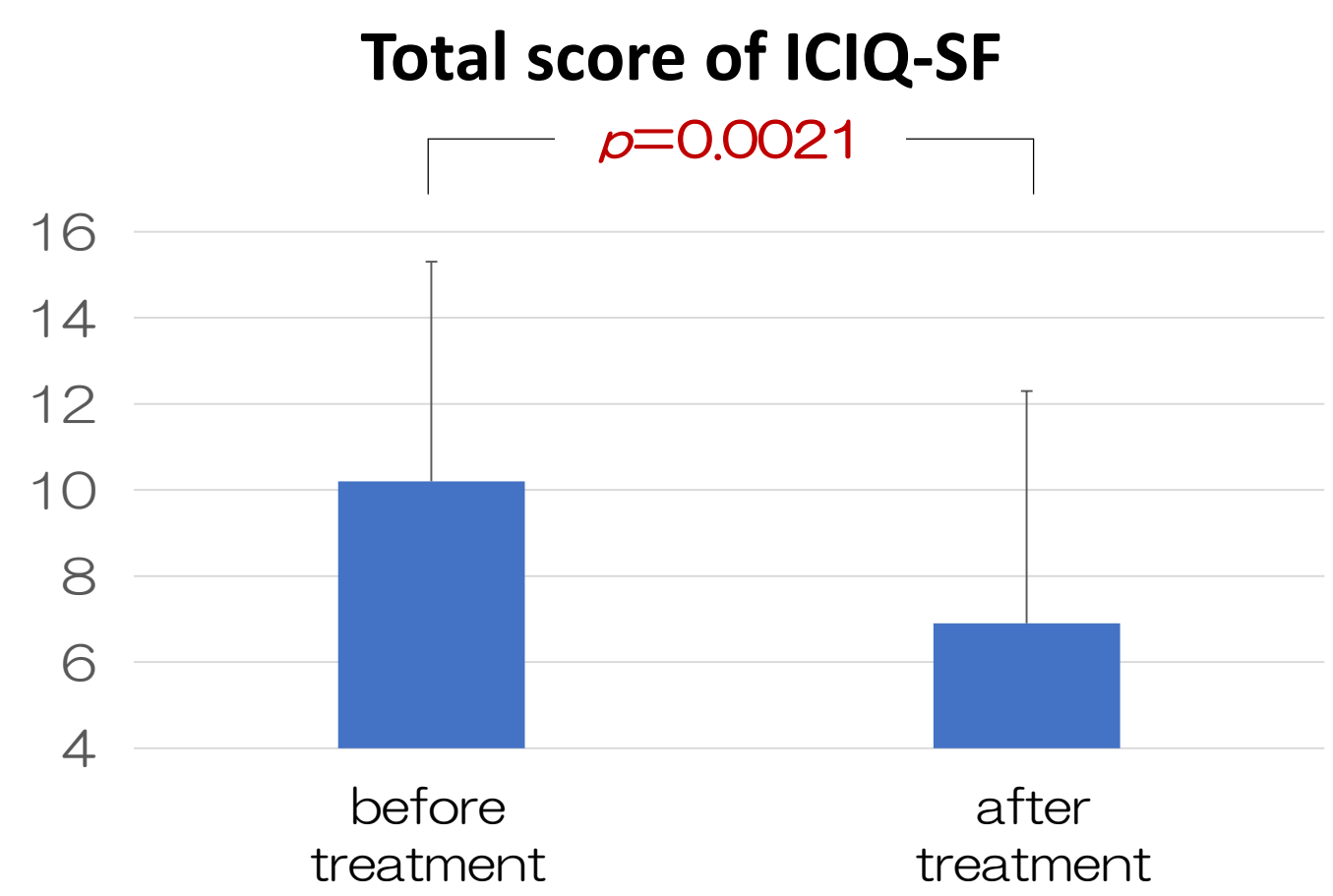
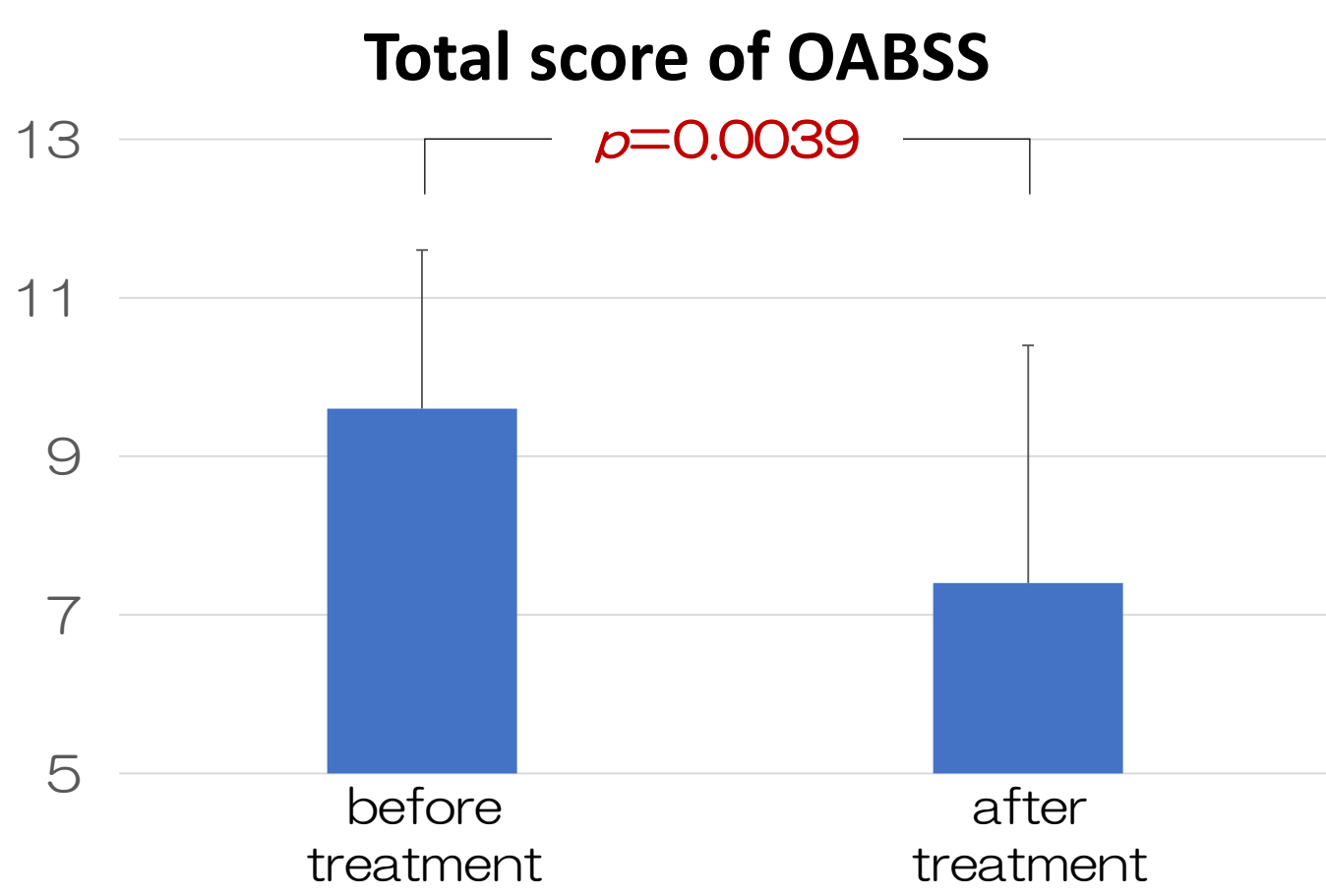
**MATERIALS AND METHODS:** Patients with refractory OAB who could not be cured by drug therapy were included. This study was a prospective study, and the patient underwent TEPTNS therapy using SSP electrodes twice a week for 6 weeks (12 times in total). One treatment session was 30 minutes. The stimulation sites were SP6 (Sanyinjiao) point of both legs, and the SSP electrode was placed at each site. The SSP point electrode was made of silver plated brass that can stimulate nerves without inserting a needle. The tip of SSP electrode stretched skin and lowers electric resistance. As a result, electric current was concentrated on the tip, and electric stimulation became possible. The pulse wave was a biphasic symmetrical wave, the pulse width was 50  $\mu$ s, and the frequency was from 2 to 16 Hz. The intensity was maximum tolerable level.

## BACKGROUND

	N=18
Age	62.7 $\pm$ 18.7 (8-83)
Sex (male : female)	13 : 5
Total score of OABSS	9.6 $\pm$ 2.0
Total score of ICIQ-SF	10.2 $\pm$ 5.1
<b>Frequency volume chart</b>	
Daytime voids	9.6 $\pm$ 2.2
Nighttime voids	1.5 $\pm$ 1.1
Frequency of urgency episode	3.2 $\pm$ 3.6
Frequency of urinary Incontinence episode	1.5 $\pm$ 1.8
Degree of incontinencea (ml/day)	113.3 $\pm$ 275.5
Urine volume (ml/day)	1676.8 $\pm$ 612.1
Maximum voided volume (ml)	271.9 $\pm$ 116.1
Average voided volume (ml)	152.0 $\pm$ 70.1



## RESULTS



## Frequency volume chart

	before treatment	after treatment	P value
Daytime voids	9.6 $\pm$ 2.2	8.9 $\pm$ 2.4	0.0741
Nighttime voids	1.5 $\pm$ 1.1	1.6 $\pm$ 1.0	0.1831
Frequency of urgency episode	3.2 $\pm$ 3.6	2.0 $\pm$ 2.8	0.0234
Frequency of urinary Incontinence episode	1.5 $\pm$ 1.8	1.0 $\pm$ 1.7	0.1387
Degree of incontinencea (ml/day)	113.3 $\pm$ 275.5	122.8 $\pm$ 347.3	0.5188
Urine volume (ml/day)	1676.8 $\pm$ 612.1	1739.6 $\pm$ 568.5	0.7644
Maximum voided volume (ml)	271.9 $\pm$ 116.1	307.3 $\pm$ 170.9	0.4199
Average voided volume (ml)	152.0 $\pm$ 70.1	160.9 $\pm$ 74.7	0.6023

- The TEPTNS therapy with SSP electrodes in refractory OAB was effective.
- There was no adverse event.
- The total scores of OABSS and ICIQ-SF were significantly decreased.
- In frequency-volume chart, there was a significant difference in the frequency of urgency episodes.

**CONCLUSIONS:** This study was the first to evaluate the effectiveness and safety of the TEPTNS therapy with SSP electrodes in refractory OAB. This therapy was found effective and safe.