

Kane *et al.* evaluated 205 963 patients from the National Cancer Data Base in the USA between 1993 and 2004, and showed an increase in stage 1 disease (1993, 50.6%; 2004, 59.5%), and a decrease in stage 2 and stage 3 ( $P \leq 0.01$ ). Stage 4 disease remained relatively constant throughout the 12-year period, similar to our study. In addition, the size of stage 1 tumors also decreased from a mean of 4.1 cm in 1993 to 3.6 cm in 2003.<sup>1</sup> Similar to these reports, over time there has been a migration towards early T1a tumor stage in our cohort. Furthermore, approximately 75% of the patients were diagnosed without symptoms, which did not change over time. This might result from the use of sophisticated medical devices, including ultrasonography or computed tomography, that can detect even small renal masses.

With regard to tumor nuclear grade, some articles suggested an increase in high-grade tumors, similar to our findings.<sup>2,3</sup> Doeuk *et al.* suggested that there has been an increasing representation of Fuhrman grade 3 tumors over time, from 17.6% to 30.8%, and a decreasing proportion of Fuhrman grade 1 tumors, from 16.2% to 7.1%.<sup>2</sup> Pichler also reported similar results.<sup>3</sup> Although the two articles discussed possible reasons, including changes in pathological assessment, further molecular studies will be required.

Although our study did not show significant trend in histopathology, Doeuk *et al.* reported that conventional RCC decreased from 85.3% to 74.7%, whereas papillary RCC increased from 1.3% to 13%.<sup>2</sup> In contrast, Pichler *et al.*

suggested that there has been a significant histological migration for chromophobe subtype from 1.1% to 4.3%.<sup>3</sup>

Our findings show a significant stage migration in patients with renal cancer. Small RCC increased over time, whereas 10% of the patients with RCC were detected through the diagnosis of distant metastasis. However, these results do not necessarily represent Japanese RCC distribution, because the study was a single institutional study.

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## Conflict of interest

None declared.

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## Sacral neuromodulation is an effective option for non-obstructive urinary retention in men with cerebral palsy

Urinary retention can be a significant complication in men with cerebral palsy. Achieving voiding can be difficult, even with the implementation of a surgical method, such as sacral neuromodulation, a surgical process by which electrical stimuli modulate the activity in a sacral neural pathway. S<sub>3</sub> sacral neuromodulation received approval by the US Food and Drug Administration for the treatment of urge incontinence in 1997, and for urgency/frequency and non-obstructive urinary retention in 1999.<sup>1</sup> The exact mechanism of action has not been well defined, but it appears to involve the electrical modulation of spinal cord reflexes and brain networks through peripheral afferents instead of direct stimulation of the detrusor muscle or urethral sphincter. Most reports of sacral neuromodulation for non-obstructive urinary retention in men have been case studies, and only one randomized control study has shown its usefulness.<sup>2,3</sup> A number of studies have reported success rates ranging from 74% to 100% in female participants, leaving male patients in the minority and, for the most part, not clearly identified as to how well they compare with female patients. Unfortunately, no prior study has examined sacral neuromodulation for men with non-obstructive urinary retention as a result of moderately severe cerebral palsy. My practice experienced success with a 59-year-old patient who was fully ambulatory with cerebral palsy affecting the left face and

arm. His urodynamics showed no detrusor pressure, but an intact sensation (but inability) to void. During stage 1 sacral neuromodulation, we achieved excellent levator ani contraction and right plantar flexion with an external pulse generator power setting of 0.5 volts. After surgery, the patient began to void almost immediately with ultimate residual urine by straight catheterization of 50–100 mL and maximum urinary flow rate of 13 mL/s. At follow up, the patient continues to void, and has consistent max flow rates and low post-void residual urine. A number of simple, objective criteria have proven useful in identifying patients with neurological disease who will experience success with sacral neuromodulation.

When considering sacral neuromodulation for either sex for non-obstructive urinary retention with or without neurological comorbidities, I often consider men to be candidates if they have fewer than two comorbidities, are fully ambulatory without any assistance (i.e. even a cane) and, with urodynamics, still have reasonable sensation to void (Fig. 1). The literature in general does not disclose useful criteria, and my own conditions need to be confirmed by other clinicians to prove truly useful. In my practice, three of 12 men fulfilled the criteria and underwent the procedure, with just two (2/3, 66%) achieving successful voids and stage 2 implantation. Conversely, the number of women fulfilling the criteria with successful results totalled

1. Patients must be fully ambulatory without assistance of a cane or walker.
2. During urodynamics, patient must have sensation to void at less than 250 mL.
3. During staged trial, a strong ipsilateral big toe plantar flexion and bellows (levator ani contraction) must occur with pulse generator power setting at less than 2 volts (preferably <1 volt). Surgeon should make multiple attempts to locate S<sub>3</sub> to accomplish this.

**Fig. 1** Criteria for sacral neuromodulation in neurologically impaired patients with non-obstructive urinary retention.

seven out of 11 (64%). The present male patient was an attractive candidate, because fulfilling the criteria meant that his peripheral and central nervous systems integrated well with his cerebral palsy, which could be the reason for his successful sacral neuromodulation. Utilization of exclusionary criteria for neurologically impaired patients with urinary retention will likely disclose the best possible candidates while disqualifying those who cannot ambulate well without assistance and who have multiple comorbidities.

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## Editorial Comment

### Editorial Comment to Sacral neuromodulation is an effective option for non-obstructive urinary retention in men with cerebral palsy

Sacral neuromodulation (SNM) has proven to be a remarkable addition to the urological armamentarium as a treatment option for patients with urgency frequency syndrome, urgency incontinence or non-obstructive urinary retention unresponsive to medical therapy. Multiple neuroanatomical pathways have been described for sacral neuromodulation including the S3 nerve root, pudendal nerve and tibial nerve.<sup>1</sup> Most reports of sacral neuromodulation for non-obstructive urinary retention in men have been case studies, and only one randomized control study has shown its usefulness. The author focuses on a male patient with cerebral palsy whose voiding dysfunction, non-obstructive retention.<sup>2</sup> The patient was successfully treated with SNM, and the patient selection criteria for SNM in neurologically impaired patients with non-obstructive urinary retention was proposed. Neuromodulation provides an attractive option owing to its minimally-invasive approach. Although there is often great variability in patients with lower urinary tract dysfunction, it is important to meet criteria. But it is not complete results for patients excepted from criteria. It is feasible to have another option for functional damage in the lower urinary tract in the near future. It is known that adiposed-derived stem cells have the ability to differentiate to the nerve. We have previously reported the injection of adiposed-derived regenerative cells to damaged

## Conflict of interest

None declared.

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lower urinary tract for stress incontinence after prostatectomy in older men.<sup>3</sup> The current clinical management approaches in the present article might present other options within the context of future directions including cell-based regenerative therapies.

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