Patients with medication-refractory OAB symptoms should be further treated with neuromodulation

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Overactive bladder (OAB) is a condition defined by the International Continence Society (ICS) as urgency with or without urgency incontinence, usually with increased daytime frequency and nocturia.¹ Patients with OAB have significantly reduced quality of life.² Population-based surveys done in Canada have shown high prevalence (14%) in both sexes.³ In a survey of over 19 000 adults in Canada and Europe, the overall prevalence of OAB was 12.8% in women and 10.8% in men.⁴ The similar study in United States showed that overall, 16.5% of the U.S. population aged ≥ 18 years (about 33 million people) have symptoms of OAB.⁵ The initial treatment of the OAB includes anticholinergic medications. Compliance and satisfactory results, however, are low after 1 year and range from 18% to 65%.^{6,7} Patients with medication refractory OAB have the option of sacral neuromodulation (SNM), intravesical injection of Botulinum Toxin type A (BTX A) or surgery, such as bladder augmentation or diversion.

I strongly believe the most appropriate option for these patients is SNM. It is the most innovative treatment modality developed in recent years for the management of OAB and other voiding dysfunctions; it has also been approved by Health Canada for this indication since 1999. The ideal treatment should be effective, safe and financially sound. There is no question that SNM is effective. Brazzelli and colleagues systematic review found that 80% (4 randomized controlled trials) and 67% (30 case series) of patients became dry or achieved a $>50\%$ improvement in symptoms after implantation.⁸ Our own data showed 84.8% success rate with a median follow-up of 50 months (Fig. 1).¹⁰ Furthermore, in a recent study, overall satisfaction was reported as high as 90%.⁹ There are very little initial complications with the device. The infection rate is under 5%; in our series of 96 implants, no infection was reported at all. There is a possibility of seroma formation which was described occasion-

ally. In our experience, the reoperation rate due to malfunction of the device or lack of improvement was initially high at 40%. The main reason for revisions (50%) was poor response. The second most common indication (17%) for revision was local pain from the device. The median time for revision was 24 months. Review of the literature of 855 patients, showed 33% revision rate. Most of the studies, including ours, consist of sacral nerve stimulation non-tined lead data, which have higher complication rates associated with the open fasciotomy procedure and lead migration.¹⁰ With the advances in the equipment and surgical technique, this rate was reduced to 26% with a combined revision rate of 32% in our experience. The biggest improvement was in the introduction of the tined-lead which can be implanted through percutaneous, minimal invasive technique. Some patients also complained of unpleasant sensations or pain. This, however, was usually resolved with reprogramming. Patients are followed on a regular basis the third and sixth month mark, and then yearly. The battery life was on average 113 months.

Patients with refractory OAB symptoms, other than SNM, have very few options left. Ileocystoplasty or diversion can be a very extensive surgery associated with complications and severe consequences; also, it has an overall low satisfaction rate. Other treatments available for these patients include BTX A, which is still considered investigational in Canada. It is not approved in Canada for OAB and its use is off-label. The satisfaction rate, although in the 60% to 70% range, not long-lasting. One of the limiting factors with BTX A is urinary retention, which ranges from 0 to 44%^{11,12} or high post-void residual requiring intermittent catheterizations in 5% to 43% of patients.¹³ Urinary tract infections are in the range of 13% to 44%. On average, OAB patients require repeat bladder BTX A injections every 6 to 9 months.

There are no Canadian studies on the cost-effectiveness of SNM and BTX A. Recently, European researchers concluded that SNM treatment is cost-effective after 5 years

Fig. 1. Kaplan-Meier graph of sacral neuromodulation retention (SNM) rate. The black curve indicates urge urinary incontinence. Dotted curve indicates bladder pain syndrome. Grey curve indicates IUR. Adapted from Al-zahrani et al.¹⁰

compared to BTX A in most cases.¹⁴ However, when local anesthesia is used for BTX A treatment and if a peripheral nerve evaluation is not a stage procedure or bilateral test, SNM was not cost-effective. These are, however, European data which are difficult to extrapolate to the Canadian health care environment. There are some reports from United States which suggest the use of SNM instead of medication for patients with OAB symptoms.¹⁵ This suggestion must also be placed within the Canadian health care context.

In conclusion, SNM remains the obvious alternative for patients with refractory OAB symptoms.

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References

1. Abrams P, Cardozo L, Fall M, et al. The standardisation of terminology of lower urinary tract function: report from the standardisation sub-committee of the International Continence Society. *Neurourol Urodyn* 2002;21:167-78.
2. Fultz N, Girts T, Kinchen K, et al. Prevalence, management and impact of urinary incontinence in the workplace. *Occup Med (Lond)* 2005;55:552-7.
3. Herschorn S, Gajewski J, Schulz J, et al. A population-based study of urinary symptoms and incontinence: the Canadian Urinary Bladder Survey. *BJU Int* 2007;101:52-8.
4. Irwin DE, Milsom I, Hunskaar S, et al. Population-based survey of urinary incontinence, overactive bladder, and other lower urinary tract symptoms in five countries: results of the EPIC study. *Eur Urol* 2006;50:1306-15.
5. Stewart WF, Van Rooyen JB, Cundiff GW, et al. Prevalence and burden of overactive bladder in the United States. *World J Urol* 2003;20:327-36.
6. Basra RK, Wagg A, Chapple C, et al. A review of adherence to drug therapy in patients with overactive bladder. *BJU Int* 2008;102:774.
7. Kelleher C, Cardozo L, Khullar V. A medium-term analysis of the subjective efficacy of treatment for women with detrusor instability and low bladder compliance. *Br J Obstet Gynaecol* 1997;104:988.
8. Brazzelli M, Murray A, Fraser C, et al. Efficacy and safety of SNS for the treatment of urinary urge incontinence: a systematic review. *J Urol* 2006;175(3 Pt 1):835-41.
9. Leong RK, Marcelissen TA, Nieman FH, et al. Satisfaction and patient experience with sacral neuromodulation: results of a single center sample survey. *J Urol* 2011;185:588-92.
10. Al-zahrani AA, Elzayat EA, Gajewski JB. Long-term outcome and surgical interventions after sacral neuromodulation implant for lower urinary tract symptoms: 14-year experience at 1 center. *J Urol* 2011;185:981-6.
11. Sahai A, Khan MS, Dasgupta P, et al. Efficacy of botulinum toxin-A for treating idiopathic detrusor overactivity: results from a single center, randomized, double blind, and placebo controlled trial. *J Urol* 2007;177:2231-6.
12. Brubaker L, Richter HE, Visco A, et al. Refractory idiopathic urge urinary incontinence and botulinum A injection. *J Urol* 2008;180:217-22.
13. Flynn MK, Amundsen CI, Perevich M, et al. Outcome of a randomized, double-blind, placebo controlled trial of botulinum A toxin for refractory overactive bladder. *J Urol* 2009;181:2608-15.
14. Leong RK, de Wachter SGG, Joore MA, et al. Cost-effectiveness analysis of sacral neuromodulation and botulinum toxin A treatment for patients with idiopathic overactive bladder. *BJU Int* 2010 Dec 16. doi: 10.1111/j.1464-410X.2010.09905.x. [Epub ahead of print].
15. Burks FN, Peters KM. Neuromodulation versus medication for overactive bladder: The case for early intervention. *Curr Urol Rep* 2009;10:342-6.

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