

**EARLY DIAGNOSIS AND
ADEQUATE TREATMENT
in
THE NEUROGENIC BLADDER**

NGUYỄN ĐÌNH THÁI

KHOA NIỆU

BV NHI ĐỒNG 2

Introduction

- ▶ Neurogenic bladder sphincter dysfunction (NBSD): result of a lesion at any level in the nervous system
- ▶ From congenital neural tube defects (myelomeningocele, spina bifida, ...) / acquired causes (tumor, trauma).
- ▶ Disordered innervation of the detrusor musculature and external sphincter.
- ▶ Untreated: incontinence, secondary damage and dysfunction → upper and lower urinary tracts.

Pathophysiology

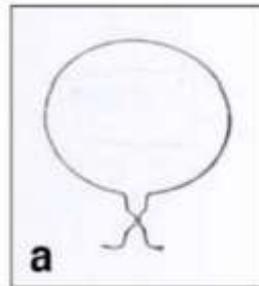
- ▶ disordered innervation of the detrusor musculature and external sphincter
- ▶ detrusor external sphincter dyssynergia
- ▶ increase intravesical pressure (>40 cm H₂O)
- ▶ Upper/ lower urinary tract deterioration.

Management

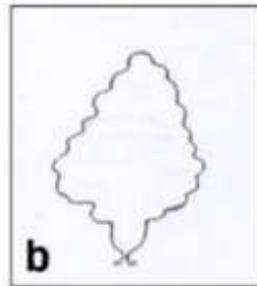
- ▶ Treatment goals:
 - ▶ prevent or minimize secondary damage to the upper urinary tracts and bladder
 - ▶ achieve safe social continence
- ▶ Optimal management:
 - ▶ Early diagnosis & recognition of high-risk subtypes (urodynamic)
 - ▶ Proactive therapy:
 - ▶ Clean intermittent catheterization (CIC)
 - ▶ Anticholinergics (oxybutynin)

Management

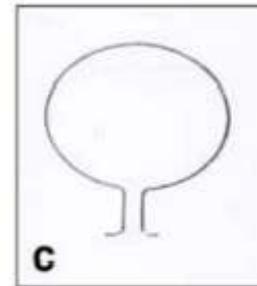
Fig. 1 Classification of the neurogenic bladder, with four subtypes (**a-d**) according to dysfunctional activities of sphincter and detrusor. For each subtype, clinical implications if untreated and principles of management are summarized



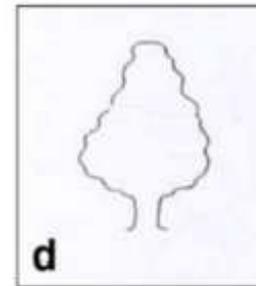
a



b



c



d

dysfunction

consequences

management

a : sphincter ++ / detrusor --

unsafe, leaking, infections

safe and dry with CIC

b : sphincter ++ / detrusor ++

DSD, unsafe from birth
(reflux, infections, renal damage)

safe and dry with oxybutynin + CIC

c : sphincter -- / detrusor --

safe but wet

safe and dry with CIC + outlet surgery
cave detrusorinstability after outlet surgery

d : sphincter -- / detrusor ++

wet and unsafe

safe and dry with CIC + oxybutynin
+ outlet surgery

Evidence based

- ▶ Am J Dis Child. 1992: Kasabian, Children's Hospital, Boston
 - ▶ **The prophylactic value of clean intermittent catheterization and anticholinergic medication in newborns and infants with myelodysplasia at risk of developing urinary tract deterioration**
 - ▶ **After 5 years follow up:**
 - ▶ 24 (92%) / 26 children had normal kidney function and drainage
 - ▶ 2 (8%) developed hydronephrosis
 - ▶ 1 had vesicoureteral reflux
 - ▶ **Control group:** upper urinary tract had changed in 48%

Evidence based

- ▶ J Urol. 1999: Kaefer, Children's Hospital, Harvard Medical School, Boston.
 - ▶ **Improved bladder function after prophylactic treatment of the high risk neurogenic bladder in newborns with myelomeningocele.**
 - ▶ **After 4 years follow up:**
 - ▶ 3 (17%) / 18 children treated prophylactically required enterocystoplasty
 - ▶ 11 (41%) / 27 children treated expectantly required augmentation

Evidence based

- ▶ Neurourol Urodyn. 2006: Kessler, University Hospital Innsbruck, Austria
 - ▶ **Early proactive management improves upper urinary tract function and reduces the need for surgery in patients with myelomeningocele.**
 - ▶ Initial evaluation & medical treatment:
 - ▶ day of birth to age 2: 15% required surgical interventions
 - ▶ age 3 to age 10: 34%
 - ▶ after age 10: 59%
 - ▶ ***initiation of proactive neurourological management as early as possible, ideally from the day of birth, is strongly recommended***

Conclusions

- ▶ Medical management (CIC and anticholinergics): preserving renal function and providing safe urinary continence in more than 90% of patients with a neurogenic bladder.
- ▶ **Early diagnosis and adequate treatment** (long before toddler age) → prevent: renal damage & secondary bladder wall changes → no longer need surgical bladder augmentation to achieve safe urinary continence in adolescence and adulthood.