

Comparison of neurogenic lower urinary tract dysfunctions in open vs. closed spinal dysraphism: Results observed in a prospective cohort of 395 patients

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Introduction

Spinal dysraphism is the first congenital cause of neurogenic bladder. Open spinal dysraphism (mainly myelomeningocele) being in the vast majority of cases diagnosed in the neonatal period, the neurogenic lower urinary tract dysfunctions (NULTD) it causes are well-known as they have been described for decades in many series. Conversely, closed spinal dysraphism is not always associated with cutaneous markers and are often diagnosed later in the patient's life thanks to modern imaging such as MRI. Hence, little data exist regarding NULTD due to closed spinal dysraphism.

The aim of this study was to compare the NULTD observed in patients with closed dysraphism (CD) to those observed in patients with open dysraphism (OD).

Methods

A prospective study was conducted between 2007 and 2016 including all spina bifida patients seen in a multidisciplinary national referral center.

At the first visit, lower urinary tract function was assessed whether the patient reported lower urinary tract symptoms or not. This assessment included: history of past urological surgery, type of spinal dysraphism (open or closed), Abbreviated Injury Scale, method of bladder emptying, Urinary Symptom Profil (USP) and Qualiveen scores and urodynamic parameters.

Quantitative variables were expressed as mean and standard deviation and categorical variables as numbers and proportions. Patients' characteristics were compared using the Chi-2 test for categorical variables and the Mann-Whitney test for quantitative variables.

Results

Three-hundred and ninety-five patients were included : 274 with an OD (69.4%) and 121 had with a CD (30.6%). Patients in the CD group were older (35.9 vs. 29.5 years, $p < 0.0001$), and had lower BMI (23.8 vs. 28 years, $p = 0.0002$).

The method of bladder emptying was spontaneous voiding, clean intermittent catheterization and transileal cutaneous ureterostomy in 47.1% vs. 29.3% ; 47.1% vs. 59.4% and 5.7% vs. 11.2% of CD and OD patients respectively ($p = 0.01$).

The prevalence of urinary incontinence did not differ significantly between the two groups (44.7% vs. 53.5%; $p = 0.23$), as well as the mean Qualiveen score (76.6 vs. 81.7 , $p = 0.19$). The main medical and / or social concern was NLUTD in 26% of patients with CD and in 27.8% of patients with OD ($p = 0.73$).

Augmentation cystoplasty was more common in patients with OD (29.2% vs. 10.2%; $p < 0.0001$) as was artificial urinary sphincter (13.2% vs. 4.6 %; $p = 0.01$) and continent cystostomy (10.2% vs. 0.9%, $p = 0.002$).

	Open Spinal Dysraphism N=274	Closed spinal dysraphism N=121	p-value
Age (years)	29.5	35.9	<0.0001
Body Mass Index	28	23.8	0.0002
Method of bladder emptying			0.01
Spontaneous voiding	29.3%	47.1%	
Clean Intermittent catheterization	59.4%	47.1%	
Cutaneous urinary diversion	11.2%	5.7%	
Augmentation Cystoplasty	29.2%	10.2%	<0.0001

	Open Spinal Dysraphism N=274	Closed spinal dysraphism N=121	p-value
Mean Qualiveen-SF (/4)	2.72	2.55	0.19
Urinary Incontinence	53.5%	44.7%	0.23
Major concern = Urological disorders	27.8%	26%	0.73
Compliance < 20 ml/cm H2O	79 (29%)	21 (17.4%)	0.27
End-stage renal Failure	8 (2.8%)	2 (1.6%)	0.73

Conclusion

In this prospective cohort, NLUTD were as frequent and troublesome in patients with open vs. closed spinal dysraphism.

However the need for a surgical treatment of NLUTD was more common in patients open spinal dysraphism.