

UROLOGICAL FUNCTIONAL OUTCOMES FOLLOWING NEUROSURGICAL MANAGEMENT OF SPINAL DURAL ARTERIOVENOUS FISTULAE: A SINGLE CENTRE EXPERIENCE OF 30 CONSECUTIVE PATIENTS

Hypothesis / aims of study

Spinal dural arteriovenous fistula (SDAVF) is an uncommon condition and its diagnosis is frequently delayed. Untreated SDAVF may lead to progressive congestive myelopathy with urinary dysfunction and progressive paraplegia. Neurosurgical division of the fistula and superselective embolisation are recognised treatment options. Currently, we have the largest series of patients with type 1 SDAVF. We aimed to identify the urological symptoms in these patients, and determine the effect of duration of symptoms and treatment on urological function.

Study design, materials and methods

We performed a retrospective analysis of prospectively acquired data on consecutive patients with type 1 SDAVF between 2007 and 2013 treated by the senior neurosurgical author. Follow-up data was available up to 48 months after treatment. Patients' age, sex, type, duration of symptoms, and level of fistula were analysed. Urological functional outcomes pre and postoperatively were determined using the Aminoff-Logue Grading Scale for Micturition (Table 1). Statistical analysis was performed in the R software package (version 3.1.2), using Fisher's exact test or ordinal logistic regression models.

Table 1: Aminoff-Logue Disability Score for Gait and Micturition

GAIT	
0	Normal
1	Leg weakness, abnormal gait, but no restriction of activity
2	Restricted activity
3	Requiring one stick for walking
4	Requiring two sticks, crutches or frame
5	Confined to wheelchair
MICTURITION	
0	Normal
1	Hesitancy, frequency, urgency
2	Occasional urinary incontinence or retention
3	Total incontinence or persistent retention

Table 2: Summary of Results and Continence Outcomes

Total undergoing surgical intervention	n=35
Excluded	n=5
Total included in study	n=30
Mean/median age	67.7 years/ 69 years (range 24-83)
Male : Female	15:15
Mean/median duration of symptoms to surgical intervention	19.4/15 months (range 0-48)
Level of lesion	Thoracic =22; Lumbar =7; Sacral =1
Patients with LUTS	
a) Pre-operative	n=27
b) Post-operative	n=27
Median Aminoff-Logue Micturition Score	
a) Pre-operative	2
b) Post-operative	1

Table 3: Pre and Post-Op Micturition Score- Contingency table for data

	Pre-Operative Micturition Scores				Total
Post-Operative Micturition Scores	0	1	2	3	
0	1	1	1	0	3
1	1	8	4	2	15
2	0	1	5	2	8
3	0	0	0	4	4
Total	2	10	10	8	30

Table 4: Urological Continence on Follow-Up (6-48 months)

Continence Outcome	
Long term catheter (on discharge or at 6 month follow up)	6
Catheter free (on discharge or at 6 month follow-up)	17
ISC	7 (5+2) * Includes 2 patients pre-operatively; One patient diagnosed with BPH performed ISC prior to TURP

Results

Thirty patients underwent neurosurgical intervention for type 1 SDAVF. Mean age was 67.7 years (range 24-83). The SDAVF was located in the thoracic, lumbar and sacral areas in 73.3%, 23.3% and 3.3% of patients respectively. Sphincter disturbances were present in 90% of patients pre-operatively, with a symptom duration of 0.5 to 48 months. The pre-operative Aminoff-Logue Micturition score were 0, 1, 2 and 3 in 6.7%, 33.3%, 33.3% and 26.7% of patients respectively (Table 2). Post-operatively, there was a difference in the distribution of micturition scores ($p=0.01$); 33.3% improved, 60% remained static and 6.7% deteriorated (Table 3).

Interpretation of results

The duration of symptoms had a statistically significant effect on change in micturition score (OR 0.93, 95% CI 0.86-0.98, $p=0.02$): shorter symptom duration was associated with better urological outcomes. At follow-up, six patients required long term catheter, seven were performing intermittent self-catheterisation, and 17 were catheter free (Table 4).

Concluding message

SDAVF is associated with various motor and bladder disturbances. The majority of patients undergoing neurosurgical treatment either experienced improved or unchanged lower urinary tract symptoms and function. However, a number of patients require catheterisation despite treatment. Predictors of reversible sphincter disturbance merit further study.

Disclosures

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