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Urodynamics post stroke in patients with urinary incontinence: Is there correlation between bladder type and site of lesion?

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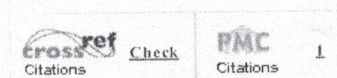
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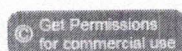
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→ Abstract

Objective: Assessment of bladder by urodynamic study (UDS) in patients with urinary incontinence following stroke, and correlation with site of lesion. **Study Design and Setting:** Retrospective cross-sectional study in the neurological rehabilitation unit of a tertiary care institute. **Materials and Methods:** Forty patients (22 males) with arterial or venous, ischemic or hemorrhagic stroke, with urinary incontinence in the acute phase following the event, underwent UDS. Seventeen patients had right hemiplegia, 18 had left hemiplegia, and five had posterior circulation stroke with brainstem/cerebellar features. Bladder type was correlated with age, side, and site of lesion. **Results:** The mean age was 46.80 ± 16.65 years (range: 18-80 years). Thirty-six patients had arterial stroke and four had cortical venous thrombosis. UDS was performed after a mean of 28.32 ± 10.27 days (range: 8-53 days) after the stroke. All but one patient had neurogenic bladder dysfunction, with 36 patients (90%) having overactive detrusor (OD) and three having underactive/areflexic detrusor. Among the 36 patients with OD, 25 patients (62.5%) had OD without detrusor-sphincter dyssynergy (DSD) and 11 (27.5%) had OD with DSD. Bladder management was advised

based on the UDS findings. No significant correlation ($P > 0.05$) was found between type of bladder and age or side and site of lesion. **Conclusions:** UDS is a useful tool to assess and manage the bladder following stroke with urinary incontinence. In this study, no significant correlation was found between UDS findings and site of lesion.

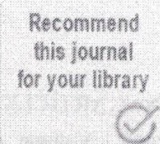
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→ Introduction

The prevalence of urinary incontinence is 38-60% in stroke survivors in the acute phase.^{[1][2][3]} It is correlated with the size of the infarct or hemorrhage, the site of the lesion, the presence of cognitive impairment, aphasia, the morbidity & mortality, and the discharge destination of the patient.^{[4][5]} Urinary incontinence has prognostic significance post stroke; patients with urinary incontinence have high mortality, with 52% dying within 6 months of the stroke.^[6] Its presence is also a predictor of moderate or severe disability at 3 months post stroke in patients younger than 75 years of age.^[7]

Gelber *et al.*^[4] suggested three major mechanisms responsible for post-stroke urinary incontinence: Disruption of neuromicturition pathways (overactive detrusor and urge incontinence); stroke-related cognitive and language deficits, with normal bladder function; and concurrent neuropathy or medication use (underactive detrusor and overflow incontinence).^[4]

Flisser *et al.*^[8] divided patients with urinary complaints following stroke into four clinical categories:

- Type 1 - no evidence of involuntary detrusor contractions on videourodynamics
- Type 2 - involuntary detrusor contractions present, patient is aware of these contractions and able to abort them
- Type 3 - involuntary detrusor contractions present, patient aware of the contractions and able to contract the sphincter but not abort the contractions
- Type 4 - involuntary detrusor contractions present, patient unaware of the contractions and unable to contract the sphincter or abort the contractions.

Overactive detrusor (OD) has been reported to be the most common urodynamic finding in stroke patients in the acute phase.^[9] Earlier studies have reported an association of OD with frontal lobe, basal ganglia, and internal capsule lesions, with or without detrusor-sphincter dyssynergy (DSD).^{[10][11]} Aybek *et al.* suggested that urinary incontinence after a cerebrovascular accident is a reversible condition and is due to an imbalance between cortical and pontomesencephalic centers.^[12]

This study was performed to evaluate the bladder in stroke patients with urinary incontinence in the acute phase by urodynamic study (UDS) and correlate the UDS findings with the site of lesion in brain.

→ Materials and Methods

This retrospective cross-sectional study was performed in 40 stroke patients (22 males, 18 females) in the neurological rehabilitation unit of a tertiary care institute. Medical records of patients admitted in the stroke unit during January 2002-June 2006 and referred for UDS were traced. Patients with first or recurrent arterial or venous stroke, with complaints of urinary incontinence post episode, were included in the study. Patients with premorbid history of obstructive or irritative urinary complaints, prostate-related complaints, obstructive urinary complaints (post episode), and patients with altered sensorium and global aphasia were excluded from the study.

Age, gender, type of stroke (arterial vs venous), side of stroke (right vs left), and risk factors for stroke were noted. Time lapse