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ORIGINAL ARTICLE

# Self-catheterization acquisition after hand reanimation protocols in C5–C7 tetraplegic patients

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**Study design:** Case series from a prospectively acquired database and phone survey.
**Objectives**: To assess the efficacy of upper limb reanimation (ULR) protocols on acquisition of intermittent self-catheterization (ISC) in C5–C7 ASIA tetraplegic patients.
**Setting**: University Hospital, Paris, France.
**Methods:** A prospectively acquired database of 152 tetraplegic patients followed in ULR consultation between 1997 and 2008 in a rehabilitation unit was studied. A total of 20 patients met the inclusion criteria, which mainly were traumatic C5–C7 tetraplegic adult patients who were unable to perform ISC, and who benefited from ULR with the objectives of improving hand abilities and of ISC acquisition, through urethral orifice for males or via a continent urinary stoma for females. The main outcome measure was ISC acquisition (ISC+) proportion. *Population characteristics and secondary outcome measures*: ISC+/ISC− patients were compared regarding epidemiological and surgical data, key-grip strength, patient global improvement score, activities of daily living and quality of life (PGI-I, Wuolle questionnaire, verbal rating scale).
**Results:** ISC+ was 75%. It depended on key-grip strength ($P<0.05$) and led to a statistically significant improvement of urinary status compared with ISC− patients ($P<0.01$). ULR improved patients' abilities and QoL in both ISC+ and ISC− patients.
**Conclusion:** ULR protocols allow ISC in most C5–C7 tetraplegic patients. Multidisciplinary care with surgeons and PRM physicians improves patients' vital and functional prognosis by changing their urological-management method.
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**Keywords:** tetraplegia; upper limb reanimation; reconstructive hand surgery; intermittent self catheterization; key grip strength; quality of life

## Introduction

Spinal cord injuries lead to motor and urinary impairments, with functional and vital prognosis. Urological complications, in relation to detrusor hyperactivity and detrusor-sphincter dyssynergia, are the first causes of morbidity and mortality in this population,[1] and the priority of management self-reported by the patients.[2] The aims of urological management include improvements in continence and prevention of kidney complications. Intermittent self-catheterization (ISC) introduced by Lapides *et al*.[3] in 1972, combined with detrusor hyperactivity treatment, enables patients to achieve these two goals.[4,5] Among patients with spinal cord injuries, those with tetraplegia have several deficiencies that limit their ability to perform ISC. This task depends mainly on the ability to use the hand and on the independent access to the urethral meatus while in a wheelchair, especially for female patients. The problem of urethral access can be resolved by formation of a continent urinary stoma (CUS) (or diversion) through various surgical techniques, which are performed after an ISC simulation test in rehabilitation units.[6,7]

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