

A Proposed Scoring System for Evaluating Neurologic Deficit after Sacral Resection: Functional Outcomes of 170 Consecutive Patients

Tao Ji, Lin Huang, Xiaodong Tang, Wei Guo

Musculoskeletal Tumor Center, People's Hospital, Peking University, Beijing 100044

Background

Surgical resections of sacral tumors usually cause neurologic deficits. A quality-of-life oriented scoring system for evaluation of lower limbs, bladder and bowel functions of patients after sacral tumor resection has been proposed.

Patients and methods

The proposed scoring system has three domains with 3 items in each domain, being allocated 0 to 3 points of each item according to the degree of functional impairment. Overall function scale is presented in percentage form. In the current single-center retrospective study, it was adopted to evaluate and quantify the postoperative functional outcomes of 170 consecutive patients underwent sacrectomy.

Results

Significant observer agreement ($p < 0.01$) was found in all nine items of the proposed system. Detailed functional outcome and difference between each group can be well described by the scoring results. Preservation of bilateral S1 nerve roots preserved majority of motor and sensory function in lower limbs. The probability and degree of urine incontinence ($P=0.003$) and abnormal bladder sensation ($p=0.039$) was significantly lower in patients with bilateral S3 nerve preserved than those whose unilateral S3 was severed. Patients with unilateral S3 preserved had a lower incidence and degree of dysuria, constipation, bowel incontinence and abnormal rectal sensation than those whose bilateral S3 were sacrificed. Functional outcomes for patients with retained coccyx were better than those with coccyx transected.

Conclusion

The scoring system can be used to evaluate sacral nerve function after sacrectomy under oncological condition.

The scoring system for evaluation of sacral nerve function following sacrectomy

		3	2	1	0
Motor Function and Sensation of Lower Limbs	Pain	None	Mild pain, nonnarcotic analgesics use	Moderate pain, intermittent narcotic analgesics use	Intractable pain, continuous narcotic use
	Motor	Normal	Mild deficit not requiring assistance of external support for walking.	Deficits requiring the assistance of external support (cane, crutch, etc.) for walking.	Deficits requiring wheelchair for ambulation/ Bedridden
	Perineal Sensation	Normal	Mild numbness or hyperesthesia not affecting daily life	Numbness or hyperesthesia affecting daily life	Completely loss of perineal sensation
Urination and Uriesthesia	Dysuria	Normal	Mild dysuria not requiring manual exertion of abdominal pressure or medical interventions.	Urinary retention requiring manual exertion of abdominal pressure or occasional catheterization(<once a week)	Urinary retention requiring indwelling catheterization or regular intermittent catheterization/Total incontinence/ Cystostomy
	Bladder Incontinence	Normal	Occasional urine leakage not requiring the regular use of diapers.	Frequent urine leakage requiring regular use of diapers.	Total incontinence/Indwelling catheterization/ Cystostomy
	Bladder Sensation	Normal	Slightly changed but still exist bladder feelings when micturating	Partial loss of feelings of stimulus to micturate	Total loss of the feelings of stimulus to micturate. /Indwelling catheterization/ Cystostomy
Defecation and Rectal sensation	Constipation	Normal	Mild defecation difficulties not requiring medical interventions.	Moderate defecation difficulties requiring regular use of enemas or laxatives.	Defecation difficulties requiring manual assistance to evacuate the feces/Total incontinence/ Colostomy
	Bowel Incontinence	Normal	Occasional incontinence not requiring the regular use of diapers.	Frequent incontinence requiring regular use of diapers.	Total incontinence/ Colostomy
	Bowel Sensation	Normal	Blunted but still exist rectal sensation when voiding	Partial loss of feelings of stimulus to defecate	Total loss of the feelings of stimulus to defecate / Colostomy