

PRESS RELEASE

Tissue bridges are reliable predictors of recovery from cervical spine injuries

Study has the potential to change clinical practice

Zurich, 28 June 2024 – The prognosis for recovery from a spinal cord injury (SCI) is of great importance for those directly affected and those around them. So far, however, it has remained imprecise. Researchers from three international rehabilitation centers in Zurich, Murnau and Denver have now succeeded in demonstrating the value of neuroimaging measurements for predicting sensory and motor recovery in people with quadriplegia. Neuroimaging measurements derived from clinical magnetic resonance imaging (MRI) record the extent of the uninjured nerve tissue next to the spinal cord lesion, known as “spinal tissue bridges”.

The results of the longitudinal study “Prognostic value of tissue bridges in cervical spinal cord injury” have the potential to change clinical practice. They have just been published in *The Lancet Neurology*, the world’s leading journal of clinical neurology ([LINK to the article](#)). The team led by lead author [Dr. Dario Pfyffer](#) and senior author [Prof. Dr. med. Patrick Freund](#) from Balgrist University Hospital and the University of Zurich, which includes SCI experts from around the world, has successfully developed models that incorporate tissue bridges in the spinal cord in a large, multicenter cohort of patients with cervical SCI for improved prognosis of clinical outcomes. These tissue bridges were measured on MRI images (taken early after the onset of the spinal cord injury). This has resulted in significant added value for the previous prognosis models, which are based on recording the clinical condition of patients upon admission to hospital. Dr. Pfyffer comments: **“An accurate prediction of the outcome is of the utmost importance for patients, treating therapists and treating doctors.”**

Remarkably, in all three rehabilitation centers, the tissue bridges also proved to be more performative and accurate predictors than the baseline clinical data for dividing patients into subgroups with similar clinical outcomes. Dr. Pfyffer stresses how important it is that models for predicting recovery are reproducible and generalizable to new patients. In particular, the study results in the individual SCI patient cohorts of the three centers with their demographic and clinical differences were validated. **“Our models and results can be transferred to other patient cohorts and are valid for all SCI centers, MRI scanners and people carrying out and evaluating the measurements.”** This lays the foundation for a successful application of tissue bridges for the improved implementation of multicenter intervention studies.

In this pioneering imaging study, the progress of recovery was investigated when the patient was discharged from hospital approximately three months after the injury and at the follow-up after 12 months. As a result, the study was able to provide convincing evidence that tissue bridges in the spinal cord are associated with short- and long-term clinical improvements, underscoring the broad clinical applicability of the study approach. The study shows the incredible potential of tissue bridges to optimize clinical decision-making, patient counseling and planning SCI studies if tissue bridges are routinely captured as part of clinical care standards. The study is also a further step in the development of more specific rehabilitation programs and individualized treatment strategies for people with spinal cord injuries.

About the participating rehabilitation centers

Patients in this multinational study were treated at Balgrist University Hospital, Zurich (Switzerland), BG Trauma Center, Murnau (Germany) and Craig Hospital, Denver (USA). These renowned trauma and rehabilitation clinics have made it their mission to advance medical research and improve patient outcomes through innovative studies and clinical applications. Their teams of experts strive to develop new approaches for the diagnosis, treatment and rehabilitation of spinal cord injuries.

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About Balgrist University Hospital

Balgrist University Hospital is a highly specialized center of excellence for the diagnostic work-up, treatment, and follow-up care of damage to the musculoskeletal system. Interdisciplinary services combine the fields of orthopedics, paraplegiology, rheumatology and physical medicine, sports medicine, neuro-urology, chiropractic, radiology, and anesthesiology.

The broad spectrum of interlinked medical treatment is complemented by nursing care, social and psychological counselling, legal advice, and integrated measures for rehabilitation and return to work. All these activities aim to provide our patients with the best possible support.

Balgrist University Hospital sets internationally recognized standards in orthopedic research and teaching with its Balgrist Campus and OR-X research infrastructures.

The privately owned Balgrist University Hospital is operated by the Balgrist Association.

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