

# Predicting the Risk of Permanent Quadriplegia in Patients With Cervical Stenosis

John Frederick Burke MD, PhD; Praveen V. Mummaneni MD; Ethan A. Winkler MD PhD; John K. Yue BA; Jason Talbott MD, PhD; Jonathan Pan MD, PhD; Adam Ferguson PhD; Michael Beattie PhD; Jacqueline Bresnahan PhD; Jenny Haefeli; William Whetstone MD; Catherine Suen; Geoffrey T. Manley MD, PhD; Sanjay S. Dhall MD

#### Introduction

The most dreaded complication of denegerative cervical stenosis is quadriplegia after minor trauma. This neurological outcome is out of proportion to the initial trauma, and likely results from severe baseline cervical stenosis. While this is often discussed between spine surgeons and their patients it is unknown whether the degree of stenosis can be used to assess the risk of quadriplegia after ATCCS.

## **Methods**

We retrospectively collected data on 30 patients with acute CCS and and the more severe quadriplegia. All patients had minor cervical trauma with the absence of fractures or dislocations in the cervical spine, neurological deficits upon presentation, and also obtained magnetic resonance imaging (MRI) of the cervical spine. We collected data regarding the patients age, degree of stenosis, and the functional outcome at discharge.

### Results

The degree stenosis at the time of injury predicted the functional outcome at discharge (p<0.05). In addition, for patients with stenosis less than 7 mm, there was a 21% risk of complete quadriplegia after minor trauma, compared to 0% chance for patients with stenosis above 7 mm.

### **Conclusions**

Given the high rate of quadriplegia after trauma for patients with stenosis equal to the diameter of the cord, surgical intervention should be considered for canal diameter of 7 mm or less in the cervical spine, independent of neurological dysfunction.

## **Learning Objectives**

In this retrospective analysis, we aimed to quantify the risk of quadriplegia after minor trauma as a function the degree of stenosis.