Systematic Review Of Trends in Neurological Complications Following Surgical Treatment Of Lumbar Spondylolisthesis In Adults

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Introduction

Studies examining neurological complication rates following surgical treatment for lumbar spondylolisthesis remain extremely limited. While surgical techniques have improved, including minimally-invasive (MIS) techniques – no assessment has been made of potential changes in neurological complication rate over this evolution. The aim of this study was to perform a systemic review of all current studies in the last 2 decades that assessed neurological complications in treatment of spondylolisthesis, associated predictive factors and examined for a trend in these factors.

Methods

A comprehensive systematic review of all publications assessing surgical treatment, neurological complications, and lumbar spondylolisthesis between 1997 and 2017 inclusive was performed from electronic databases. The following variables were determined: neurological complication rate, age, grade and percentage of spondylolisthesis reduction, surgical approach, transient versus permanent neurological deficit, mean blood loss, and mean operative time. Assessment was made for statistical correlation as well as a trend in these factors between the first and second decade studied.

Results

A total of 27 studies were identified that met inclusion criteria (12 from the first decade 2007-2017 and 15 from the second decade 1997-2006). The overall neurological complication rate was 2.6% with a significant increase in complications as well as age but a decrease in blood loss and spondylolisthesis reduction between the first and second decades. Overall neurological complication rate was positively associated with age (CC 0.31 $p<0.01$), blood loss (CC0.32, $p<0.01$) and recent studies (CC 0.3, $p<0.01$).

Conclusions

There is a paucity of data examining neurological deficits following surgical treatment for lumbar spondylolisthesis. In this review, we demonstrate statistically significant correlation between age, blood loss and recent studies and the development of neurological deficits. Recent studies demonstrate less blood loss, increased age and less reduction achieved. We propose that this interesting finding reflects the increased utility of MIS techniques in surgical treatment for spondylolisthesis.

Learning Objectives

1. Determine the neurological complication rate following surgical treatment of lumbar spondylolisthesis.

2. Understand the associations between predictive factors involving blood loss, age, and degree of spondylolisthesis reduction

3. Understand trends in complication rates and factors over the last 2 decades and their possible etiology including the role of MIS techniques for surgical treatment

References