

Risk Factors for Pseudoarthrosis and Surgical Site Infection after Spinal Fusion Utilizing the Healthcare Cost and Utilization Project Database

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Introduction

Pseudoarthrosis and surgical site infections are important causes of surgical morbidity and need for reoperation following spinal fusion. To date no large database studies have been conducted to assess these complications. The goal of this study was to identify and quantify patient risk factors for the development of pseudoarthrosis and surgical site infection (SSI) after spinal fusion in a large patient population.

Methods

The Healthcare Cost and Utilization Project (HCUP) database was queried in New York, California, Florida, and Washington in order to capture a broad base of the American population. All patients over 18 years old who underwent a spinal fusion procedure between 2009 and 2011 were included. Subsets of this patient sample who developed pseudoarthrosis or a SSI were identified, in addition to any concurrent secondary diagnoses. In accordance with the HCUP methods series and analysis guidelines, generalized linear mixed effects models were then employed to estimate the odds of experiencing post-operative psuedoarthrosis or a SSI as a function of multivariable patient characteristics and comorbidities.

Results

Risk factors for pseudoarthrosis included sleep apnea (OR = 1.35, 95CI: 1.20-1.51), hypertension (OR = 1.11, 95CI: 1.05-1.17), smoking (OR = 1.26, 95CI: 1.18-1.34), and steroid use (OR = 1.45, 95CI: 1.18-1.34). Risk factors for SSI included cardiac vessel disease (OR = 1.59, 95CI: 1.01-2.50), nutritional deficiencies (OR = 5.46, 95CI: 2.85-10.44), pulmonary disease (OR = 1.50, 95CI: 1.01-2.25), and rheumatoid arthritis (OR = 2.18, 95CI: 1.09-4.37). Increases in the number of fused segments also increased the risk for both pseudoarthrosis (OR = 1.31, 95CI: 1.24-1.38) and SSI (OR = 1.95, 95CI: 1.57-2.62).

Conclusions

Numerous risk factors for pseudoarthrosis and SSI after spinal fusion were identified. While this study strongly associates these diagnoses with the development of pseudoarthrosis and SSI, further prospective study is necessary to establish causation.

Learning Objectives

By the conclusion of this session, participants should be able to:

- 1) Describe the importance of pseudoarthrosis after spinal fusion and its risk factors.
- 2) Identify the major risk factors for pseudoarthrosis after spinal fusion
- 3) Describe the importance of surgical site infection after spinal fusion and its risk factors.
- 4) Identify the major risk factors for surgical site infection after spinal fusion