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MUSCULOSKELETAL INNOVATIONS

Analysis of the cause of pseudarthrosis in multilevel spinal fusions

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Background

- Pseudarthrosis is an important driver of revision surgery for both degenerative pathologies and spinal deformity cases

- There is a high degree of variability in reported rates of pseudarthrosis
  - Rates of pseudarthrosis range from 4% to over 20%

- Factors associated with pseudarthrosis include:
  - Comorbidities
  - Use of interbody devices/surgical strategy
  - Bone graft materials
  - Infection

Clinical Need and Industrial Relevance

- Identifying the causes of pseudoarthrosis will lend insight into opportunities to reduce the incidence of pseudoarthrosis
- Reducing the rate of revision surgery will improve the value of care
- Infection has been identified as a risk factor for failed surgery in total joint replacement and spine surgery
- Subclinical infection may be an important reason for implant loosening and failure of fusion in spine surgery

Clinical Need and Industrial Relevance

- Revision surgery is an important driver of costs in spine surgery
  - Infection and pseudarthrosis are both major drivers of revision surgery

- While infection and pseudoarthrosis rates are frequently discussed in outcomes based spine surgery literature, the role of infection as an etiology of pseudoarthrosis has not yet been described.

Project Aims

- The purpose of this study is to identify independent variables that are associated with the risk of pseudarthrosis in multilevel spine surgery

- To identify the potential strategies to reduce pseudoarthrosis rates in multilevel spine surgery

- Hypothesis:

  Independent factors that may be associated with pseudoarthrosis include modifiable patient factors and subclinical infection.

Methods

- Retrospective study of consecutive cases treated with revision surgery for the diagnosis of pseudoarthrosis

1. A query of administrative and medical ontologies will be conducted to identify a consecutive series of revision surgeries with an associated diagnosis of pseudoarthrosis

2. A chart review will be conducted to review intraoperative cultures to determine the prevalence of infection, and the microbiology in affected cases.

Methods

3. Predictor variables such as age, demographics, and comorbidities and presence of infection will be assessed to determine their predictive effect on pseudoarthrosis.

4. A comparative analysis will be conducted to assess the financial burden of treating pseudoarthrosis secondary to infection vs. treating pseudoarthrosis without infection

Milestones & Timeline

Obtain IRB Approval – Nov 30, 2016

Finish cohort identification– Dec 31, 2016

Finish collecting all data – July 31, 2017

Finish data analysis – August 31, 2017

Deliverables

- Manuscripts, data, abstracts

Proposed Budget

Personnel	$	33,000
Statistical Analysis	$	3,000
Total Direct	$	36,000
Indirects (10%)	$	3,600
Total	$	39,600