Extraction of Broken Sacral Pedicle Screws Using a Left Handed Core Drilling Bit: A Technical Report

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Introduction

Broken pedicle screws are a well-recognized complication of spinal instrumentation procedures, reportedly occurring in 0.5% to 11.2% of cases, and thought to be the result of excessive fatigue placed on the placed hardware. The resulting loss of fixation at these levels have been associated with pseudoarthrosis, instability, pain and poor surgical outcomes. These screws may also fracture within the pedicle itself, leaving broken screw threads in the pedicle wall and the decision on whether to remove the instrumentation is not fully agreed upon. Current methods include drilling a pilot hole in the fragment and using a screw extractor or by drilling a slot in the visible screw end to allow for the use of a normal screw driver. However, existing methods often involve further bone resection, weaken the involved pedicle or risk damage to the adjacent dura and neural tissue.

Methods

A 40-year-old male who previously underwent an L5 to S1 laminectomy and fusion presented to our institution with worsening symptoms and CT evaluation yielded bilateral S1 pedicle screw fractures and non-union of fusion at the L5 to S1 levels. The patient underwent removal of the existing lumbosacral

Results

Literature review of broken pedicle screws, hardware failure and screw extraction techniques was done. To our knowledge, there have been no cases reported of lumbosacral pedicle screw fragment extraction using our technique.

Conclusions

Extraction of broken pedicle screw fragments, especially when threaded fragments remain within the pedicle, remain a technical challenge in Neurosurgery. The use of a left-handed core drilling screw extraction bit may facilitate safer extraction of hardware while keeping nearby bony and neural structures intact.

Learning Objectives

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

1) Describe the occurrence rate and mechanism of broken lumbosacral pedicle screws.

2) Discuss current screw extraction techniques and possible associated complications that may occur.

3) Identify an effective and safer alternative to extraction of broken pedicle screw fragments and describe a case in which it's used.

References

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