

Introduction

We evaluate our 3-year experience with intraoperative EMG monitoring during placement of lumbar pedicle screws and determine the clinical utility of intraoperative EMG monitoring.

Methods

We studied 2012 consecutive patients who underwent posterior lumbar fusion surgery from January 2010 to December 2012. Screws were inserted under fluoroscopic guidance using anatomical landmarks. We calculated the sensitivity and specificity of IOM with pedicle screw stimulation at $\leq 10\text{mA}$ to predict a new root injury related neurodeficit.

Results

Of 2012 patients, 84 (4.2%) patients had screws which stimulated at $\leq 10\text{mA}$. In 37 out of these 84 (44%) patients, the screws were replaced or removed. A total of 42 new neurodeficits were seen in the 2012 patients under study, incidence of 2 % (CI95% 1.51-2.81%). Two of 42 (5%) new neurodeficits occurred in patients in whom the pedicle screws stimulated at $\leq 10\text{mA}$ and 40 (95%) new neurodeficits were seen in patients whose pedicle screws stimulated at $> 10\text{mA}$. The sensitivity of predicting a new root injury related neurodeficit was found to be 4.76% while the specificity was 95.84%. The positive predictive values was 2.38% (CI95% 0.29-8.34%) and the negative predictive value 97.79% (CI95% 97.19-98.51%)

Conclusions

When using IOM with EMG, a positive screw response at screw stimulation thresholds $\leq 10\text{mA}$ was highly specific for predicting a new root related neurodeficit but was poorly sensitive.

Learning Objectives

By the conclusion of this session, participants should be able to 1)identify the role of EMG in pedicle screw placement, 2) realize the limitation of the EMG technique, 3) be aware of the cost implications of the technique.