Retrospective Case Series Review of the Safety and Tolerability of Implanted Polyetheretherketone PEEK rods

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Introduction

Instrumented fixation for spinal surgery is standard method to achieve fusion. With the rising use of rigid fixation there has been recognition of the development of problems with adjacent segments in terms of premature degeneration. Polyetheretherketone (PEEK) has been increasingly used as a biomaterial for trauma, orthopedic, and spinal implants. PEEK is a thermoplastic polymer whose chemical structure maintains stability at high temperatures, resists chemical and radiation damage, exhibits greater strength per mass than many metals, and offers compatibility with many reinforcing agents. PEEK as a biomaterial is fully biocompatible, with numerous studies documenting minimal systemic, intra-cutaneous, and intramuscular toxicity.

Methods

We present a retrospective chart review of 109 cases of a single operating surgeon from 2008-2013. . Indication for surgery included lumbar stenosis and spondylolisthesis. Patients underwent decompressive lumbar laminectomy, posterior lumbar fusion, with instrumented fixation and fusion. Patients were implanted with PEEK rods from 2-4 segmental levels. Lateral intertransverse and interbody fusion techniques were also utilized.

Results

The patients were followed at monthly intervals. All patients eligible followed at one year with clinical and radiographic evaluation. Fusion mass developed with excellent clinical results. Complication rates were comparable to previous experience and published reports with no evidence of rod breakage in either group. One patient in the PEEK rod group retro pulsed a graft after a postoperative fall. This required re-operation. One patitent required re-operation for an adjacent segment disk herniation. The PEEK rod was explanted and examined.

Conclusions

PEEK rods represent a safe alternative to Titanium rods for instrumentation of the lumbar spine. The more physiological rigdicity seems to impart advantage in terms of immediate and late postoperative pain as well as an apparent trend to diminished adjacent segment disease. They additionally have the advantage of radiolucency which aids in post-operative fusion assesment

Learning Objectives

The reader should recognize that PEEK rods are a safe alternative to titanium for lumbar stabilization.

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