Polyetheretherketone rod

Polyetheretherketone rod provides excellent chemical resistance, very low moisture absorption, and high wear resistance, and it is unaffected by continuous exposure to hot water or steam.

Polyetheretherketone (PEEK) rods have become available as an alternative to metal rods for use with pedicle screws to perform the posterior lumbar fusion. PEEK has a modulus of elasticity between that of cortical and cancellous bones, thus mimicking the features of the physiological environment [1) 2) 3)].

Furthermore, PEEK is translucent to X-rays, so these rods cause fewer artifacts on computed tomography scans making radiologic follow-up easier [4)].

Experience with PEEK rod systems has shown satisfactory clinical outcomes. Therefore, these results support the use of PEEK rod systems as supplemental fixation during lumbar fusion procedures. [5)]

Posterior stabilization with PEEK rods is less invasive and was associated with significantly lower blood loss, administration of blood products, and shorter operation time. Moreover, in patients above 80 years of age reoperations rates were lower with PEEK rods, as well. Nevertheless, the benefits of PEEK rods for foraminal stenosis still have to be investigated [6)].

A multicenter study did not support the hypothesis that PEEK rods are associated with a lower adjacent segment disease risk. Reasons for readmission need to be identified to better understand the differences observed here. Further study of patients with TLIF using Ti and PEEK rods and posterolateral fusion with Ti and PEEK rods is needed [7)].

The widespread use of instrumentation in the lumbar spine has led to high rates of fusion. This has been accompanied by a marked rise in adjacent segment disease, which is considered to be an increasingly common and significant consequence of lumbar or lumbosacral fusion. Numerous biomechanical studies have demonstrated that segments fused with rigid metallic fixation lead to significant amounts of supraphysiological stress on adjacent discs and facets. The resultant disc

degeneration and/or stenosis may require further surgical intervention and extension of the fusion to address symptomatic adjacent-segment disease. Dynamic stabilization implants and disc arthroplasty have been introduced as an alternative to rigid fixation. The scope of spinal disease that can be treated with this novel technology, however, remains limited, and these treatments may not apply to patients who still require rigid stabilization and arthrodesis. In the spectrum between rigid metallic fixation and motion-preserving arthroplasty is a semirigid type of stabilization in which a construct is used that more closely mirrors the modulus of elasticity of natural bone. After either interbody or posterolateral arthrodesis is achieved, the fused segments will not generate the same adjacent-level forces believed to be the cause of adjacent-segment disease. Although this form of arthrodesis does not completely prevent adjacent-segment disease, the dynamic component of this stabilization technique may minimize its occurrence. Highsmith reported their initial experience with the use of posterior dynamic stabilization in which polyetheretherketone rods were used for a posterior construct [8].

PEEK rods demonstrate a similar fusion and reoperation rate in comparison to other instrumentation modalities in the treatment of degenerative lumbar spine disease [9].

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