

5.3.3.1 Rationale for Indication and Population Studied

(Content from P060021/A011, November 2007 Amendment, Section V, Clinical, Section 1.1, Page 11)

5.3.3.1 Rationale for Indication and Population Studied

It has been estimated that up to 70% of the adult population suffers from some form of low back (lumbosacral) pain, which is usually attributed to a degenerative disease process within the vertebral spine. Degenerative spondylolisthesis, a condition characterized by a slipping of one vertebral segment on the one below in the presence of an intact neural arch, is one of the diagnoses attributed to the degenerative disc disease process. It is more prevalent in women and the incidence increases with age.¹⁶ Spinal stenosis is often associated with the spondylolisthesis, due to facet hypertrophy, ligamentum flavum thickening, and osteophyte formation. If patient pain, neurological deficits, and instability do not respond to conservative management, decompression and lumbar spinal fusion are the most common surgical treatments of choice for degenerative spondylolisthesis and spinal stenosis.

Spinal fusion is a surgically created bony union across the involved vertebrae and approximately 70,000 posterolateral lumbar spinal fusions are performed annually. The use of bone graft to stimulate bone growth is a standard surgical technique in spinal fusion with and without instrumentation. Bone graft stimulates new bone formation and acts as a matrix or scaffold into or over which new bone can grow. Currently, autologous bone (autograft) is considered the most successful bone grafting material and it is preferred over allograft bone. The most common site for harvesting autograft material is the iliac crest. However, this increases operative time, blood loss, and the morbidity associated with spinal fusion.

In recent years, there has been focus on BMPs as osteoinductive agents. OP-1 is one such BMP. Implants containing OP-1 and collagen matrix have been shown to be osteoinductive and osteoconductive, to speed the rate of bone healing and to improve the performance of autograft in animals. Implants containing OP-1 and collagen matrix have also been shown to promote stable spinal fusions in a significantly more rapid fashion than autograft. Safety and efficacy of other BMPs in spinal applications have also been reported in animal models.

It was therefore postulated that OP-1 Putty could substitute for iliac crest autograft for the treatment of patients requiring decompression and lumbar spinal fusion, thereby eliminating the pain and morbidity associated with harvesting autograft bone from the iliac crest. A clinical study program was therefore designed to evaluate the safety and effectiveness of OP-1 Putty as a replacement to autograft in posterolateral fusion of the lumbar spine in patients with degenerative spondylolisthesis with spinal stenosis.

Reference

16. Lombardi JS, Wiltse LL, Reynolds J, Widell EH, Spencer C. Treatment of degenerative spondylolisthesis. *Spine*. 1985;10(9) 821-827.