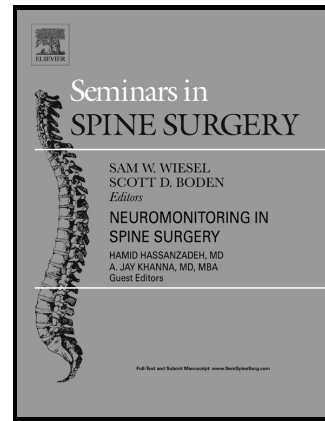


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Dheera Ananthkrishnan



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## THE USE OF BONE MORPHOGENIC PROTEIN IN SPINAL DEFORMITY SURGERY

DHEERA ANANTHAKRISHNAN, MD, MSE  
ASSISTANT PROFESSOR  
DEPARTMENT OF ORTHOPAEDIC SURGERY  
EMORY UNIVERSITY  
59 EXECUTIVE PARKS DRIVE S  
ATLANTA, GEORGIA, USA 30329

Email: dananth@emory.edu

## Abstract

The use of BMP in spinal deformity surgery is becoming common. Deformity spine surgeries have a high non-union rate due to the need to fuse many levels combined with a limited amount of autograft iliac crest bone and often the need for fusion at the lumbosacral junction. This situation has created a strong desire for a bone graft substitute/enhancer such as BMPs. However, there are no set guidelines with regards to dosage or method of utilization. This chapter will review the limited number of relevant studies, and make recommendations regarding BMP use in spinal deformity surgery.

Bone morphogenic protein (BMP) as an adjunct to standard grafting techniques has become more and more common in spinal deformity surgery. There are several issues specific to deformity surgery that make these cases suitable for the use of BMP: the relatively high non-union rate due to the multiple fusion levels, the limited amount of iliac crest available for harvest, and the need for 360 degree fusions at the lumbosacral junction. However, there are concerns about using BMP for these surgeries, particularly as there are no set guidelines with regards to dosage as well as method of utilization. In addition, the use of BMP posteriorly is technically off-label with regards to FDA approval, leaving compensation for its use in this scenario somewhat up in the air.

## Fusion rates?

Non-unions in deformity surgery are a known complication, although the incidence is quite variable. The incidence of pseudoarthrosis depends on factors related to the surgical intervention as well as the patient. The incidence has been reported as being between 17-30%, increasing with levels and particularly with the inclusion of the L5-S1 segment (<sup>1</sup>, <sup>2</sup>, <sup>3</sup>). Surgical risk factors for non-union include number of levels fused, crossing of the thoracolumbar junction, posterior fusion alone, PSO performed, type of instrumentation used (hooks greater than pedicle screws), implant density, type of graft used (local graft vs iliac crest bone graft). Medical risk factors for pseudoarthrosis include older age, female sex, history of smoking, diabetes, osteoporosis and obesity (<sup>4</sup>, <sup>5</sup>).

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