

Trends and factors associated with the utilization of BMP for single-level stand-alone anterior or single-level posterior lumbar fusion

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INTRODUCTION: Bone morphogenic protein (BMP) may be utilized to induce lumbar bony fusion. While previous studies have suggested a decline in BMP use as recently as 2015, more recent trend characterization is lacking. The current study sought to examine trends and factors associated with BMP use among patients undergoing stand-alone single-level anterior lumbar interbody fusion (ALIF) or single-level posterior lumbar fusion (PLF).

METHODS: The M157 PearlDiver 2010-2020 database was used to identify adult patients undergoing single-level stand-alone ALIF or single-level PLF. BMP use was determined utilizing ICD-9 and ICD-10 codes for its administration on the same day as surgery. Trends in BMP utilization from 2010 to 2020 among patients undergoing the delineated surgeries was determined, and factors (age, sex, comorbidities, tobacco use, geographic region, and insurance plan) associated with its use were analyzed using univariable and multivariable analyses.

RESULTS SECTION: From 2010-2020, 38,090 single-level stand-alone single-level ALIF patients were identified, of which BMP use was identified for 3,138 (8.2%) (Figure 1). Over this same time period, 201,237 single-level PLF patients were identified, of which BMP use was identified for 8,288 (4.1%) (Figure 2). For both types of procedures, BMP usage decreased significantly from 2010 to 2017 and then increased significantly / partially rebounded from 2017 to 2020 ($p<0.0001$ for each phase of the trends).

For single-level stand-alone ALIF, factors most associated with BMP use on multivariable analysis in decreasing odds ratio (OR) were: smoking within 1 year prior to surgery (OR 1.65), Midwest region of service (OR 1.65, reference South), and commercial insurance (OR 1.42, reference Medicare) ($p<0.0001$ for each). For single-level PLF, factors most associated with BMP use on multivariable analysis in decreasing OR were: smoking within 1 year prior to surgery (OR 1.85), commercial insurance (OR 1.32, reference Medicare), and Midwest region of service (OR 1.65, reference South) ($p<0.0001$ for each).

DISCUSSION: While BMP use for single-level anterior or posterior lumbar fusions reached its lowest levels in 2017, its use has increased in recent years. Factors most associated with BMP use for both cohorts included clinical factors such as smoking within 1 year prior to surgery, as well as non-clinical factors such as insurance and region of service.

SIGNIFICANCE/CLINICAL RELEVANCE: Practice patterns with regards to BMP use for single level lumbar fusions are still evolving.

Figure 1. Trends in BMP usage among patients undergoing isolated single level anterior lumbar fusion from 2010-2020

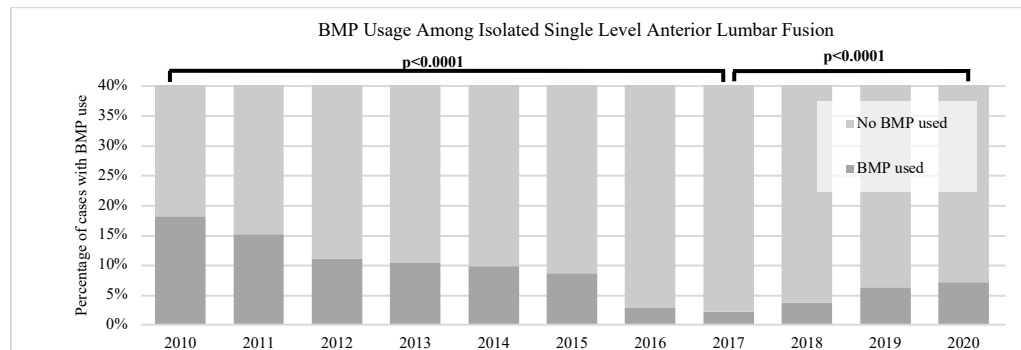


Figure 2. Trends in BMP usage among patients undergoing isolated single level posterior lumbar fusion from 2010-2020

