



Dr. Brett Taylor Spine Newsletter
884 Woods Mill Road, Suite 201
Ballwin, MO 63011
636-227-TCCO



Hot Topics in Spine Surgery: Volume II

Ultra-Low-Dose Recombinant Human Bone Morphogenetic Protein-2 for 3-Level Anterior Cervical Discectomy and Fusion

Since FDA approval of InFuse rh-BMP-2 in 2002 for fusion of the lumbar spine it rapidly gained popularity for increasing fusion rates. BMP was initially over-utilized in large doses by some surgeons for many applications including cervical spine fusion. High-dose BMP use in the cervical spine was met with complications including significant difficulty swallowing, difficulty breathing, bone over-growth including bone growth into the spinal canal and bone resorption. Shortly thereafter, a “black box warning” was issued by the FDA outlining “life threatening events” with high-dose BMP use in the cervical spine. Until recently, BMP use in the cervical spine has been limited due to this warning. In 2014, Pourtaheri et. Al performed a study reviewing the effects of ultra-low-dose BMP in the cervical spine. In this study, 0.25 to 0.36 mg of BMP was used per level in contrast to greater than 2.0 mg BMP per level with high-dose application. The study found that with ultra-low-doses of BMP, postoperative complications including dysphagia, dysphonia, aberrant bone growth and bone resorption are all significantly limited. Peri and post-operative precautions can be taken to further reduce these risks including use of a fibrin sealant intraoperatively to sequester BMP within the disc space, application of local depomedrol to the operative bed, placement of a cervical drain and upright positioning with sleeping for a minimum of 2 weeks postoperatively. Additionally, the study by Pourtaheri et. Al showed successful fusion in 97% of patients. With proper dose and application, BMP can safely be used in the cervical spine with markedly improved fusion rates. If indicated (due to fusion concerns) Dr. Taylor and the Taylor Spine Team follow these guidelines in order to maximize fusion potential while minimizing complications.

- Reference - Poutaheri, MD, Sina et al. "Ultra-Low-Dose Recombinant Human Bone Morphogenetic Protein-2 for 3-Level Anterior Cervical Discectomy and Fusion." *Orthopedics* 38.4 (2015): 241-45. Print.

Transitional Vertebrae – Bertolotti Segment

Congenital variants (present from birth) are a common finding in clinical evaluation of the spine. Specifically, as it relates to the lumbar spine, a Bertolotti variant is defined as a unilateral or bilateral enlargement of the transverse process at the lowest lumbar segment resulting in articulation or fusion with the sacrum. The transitional vertebrae are classified by Calstellvi which describe the type of hypertrophied transverse process. This transitional vertebrae variant predisposes individuals to increased degeneration and or hypermobility at the L4-L5 level and offers a protective effect of the lower (L5-S1) vertebrae. A recent study by Farshad-Amacker et. Al has shown that this condition affects 7-36% of the general population. Plain imaging including Ferguson views can be utilized in order to identify this common variant. Diagnosis is imperative in the evaluation of the injured worker as this finding may affect opinions as it relates to causation or apportionment.



Dr. Brett Taylor Spine Newsletter
884 Woods Mill Road, Suite 201
Ballwin, MO 63011
636-227-TCCO



- Reference - Farshad-A Macker, Nadja A. "Associations between Lumbosacral Transitional Anatomy Types and Degeneration at the Transitional and Adjacent Segments." *The Spine Journal* 15 (2015): 1210-216. Print

Opioid Epidemic and Spine Surgery

Prescription opiate medications (narcotics) have seen an exponential increase in use over the past few decades for both therapeutic and nontherapeutic reasons. As the "fifth vital sign" pain is an important aspect of patient assessment and treatment; however treatment with narcotics must be considered judiciously. Specifically, physicians must be cognizant of the impact of prescribing opiate medications to patients and their potential detrimental effect on clinical outcomes. Identification of the "at-risk" patient includes history of substance abuse, nicotine abuse, history of depression, pre-injury opiate use, reports of "lost or stolen" prescriptions and treatment non-compliance. Setting patient expectations through a standard pain protocol and opiate taper plan is a reliable way to establish a trusting physician patient relationship. At The Taylor Spine Team, this standard protocol (including maximum 12 weeks narcotics postop) is signed by the patient acknowledging understanding while setting accountability. If patients require further pain medications (outside 12 weeks postop) consideration is given to transferring care for pain management to a pain specialist for medication management.

- Reference - Morris, MD, Brent J., and Hassan R. Mir, MD. "The Opiate Epidemic: Impact on Orthopedic Surgery." *Journal of the American Academy of Orthopedic Surgeons* 23.5 (May 2015): 267-71. Print.

Infection Precaution

Postoperative spine infections are a relatively common adverse event which result in exponentially increased patient morbidity and perioperative costs. Identified risk factors for increased risk of spine infections include obesity, malnourishment, diabetes, immunocompromised and [nicotine]/tobacco use. Numerous studies have evaluated protocols in order to reduce the overall incidence of infection. Preoperatively, patients are provided Bactroban (Mupirocin) nasal ointment in order to eliminate a bacterial carrier state. Additionally, patients are provided hibiclens wash (chlorhexidine gluconate) with instructions to wash to surgery site for 7-10 days preoperatively to further reduce risk of bacterial infection. Prior to surgery, patients are provided prophylactic antibiotics (Cephalexin, Vancomycin or Gentamicin) and antiseptic skin preparation is applied (Chloraprep and Duraprep). Meticulous attention is paid intraoperatively to ensure sterility. If surgical time exceeds 4 hours, additional antibiotics may be given intraoperatively. Depending on the type of surgery, 500mg to 1000 mg of Vancomycin powder may be placed directly into the wound and Triclosan (antibiotic) coated suture is used for wound closure. A subfascial drain and/or a superficial drain may also be used to reduce seroma formation and subsequent pyogenic infection. If a drain is placed, patients remain on prophylactic antibiotics postoperatively until drain removal. Through strict adherence to infection risk protocols, the incidence of spine infections can be greatly reduced resulting in optimal patient outcomes. Patients with increased risk of *Staph aureus* inoculation include (healthcare providers, prison employees, teachers, etc)



Dr. Brett Taylor Spine Newsletter
884 Woods Mill Road, Suite 201
Ballwin, MO 63011
636-227-TCCO



- Reference - Pahys, Joshua M. et Al. "Methods to Decrease Postoperative Infections Following Posterior Cervical Spine Surgery." *The Journal of Bone and Joint Surgery* 95 (2013): 549-54. Print.
 - Sasso, Rick M., and Ben J. Garrido. "Postoperative Spinal Wound Infection." *Journal of the American Academy of Orthopedic Surgeons* 16 (2013): 330-36. Print.