

Clinical Study Detail

on FzioMed's adhesion barrier gel for spine surgery (available under the brand names Oxiplex®, Oxiplex®/SP and MediShield™).

Pivotal Clinical Study Detail^{1,2,3,4}

Results provided are from a prospective, multi-center, randomized, third-party blinded, parallel group 352-patient U.S. pivotal clinical study comparing Oxiplex-treated patients (n=177) to surgery only patients (n=175), to assess the safety and effectiveness of Oxiplex spine gel to reduce postsurgical pain in patients undergoing their first single-level laminotomy, laminectomy, or discectomy at L4-L5 or L5-S1.

All subjects underwent lumbar disc surgery (standard laminotomy, laminectomy and discectomy). Patients were randomly selected to receive surgery only (Control group) or surgery plus Oxiplex gel (Oxiplex group) placed on and around the dura and nerve root prior to wound closure. The effectiveness of Oxiplex for the reduction of pain and associated symptoms was assessed at baseline (before surgery) and at 1, 3 and 6 months following surgery using quality of life measure Lumbar Spine Outcomes Questionnaire (LSOQ) (Ben Debba et al⁵) and clinical evaluations.

- **In challenging patients with severe baseline back pain (Oxiplex n=78, Controls n=78), Oxiplex-treated patients at 6 months post-surgery had:**
 - **Greater improvement in Leg Pain** – Subjects in the Oxiplex group experienced 35% greater reduction in leg pain compared to surgery only Control subjects (p=0.355).
 - **Greater improvement in Back Pain** – Subjects in the Oxiplex group experienced 28% greater reduction in back pain compared to surgery only Controls (p=0.0307).
 - **Greater level of Satisfaction** – more subjects in the Oxiplex group were satisfied with the outcome of their surgical treatment than subjects in the Control group (p=0.0456).
- **In all patients (Oxiplex N=177, Controls N=175), Oxiplex-treated patients at 6 months post-surgery had:**
 - **Fewer reoperations** – subjects in the Oxiplex group had fewer reoperations during the 6-month follow-up than subjects in the Control group (Oxiplex 1 reoperation vs. Control group 6 reoperations).
 - **Fewer neurological symptoms** – Neurologic dysfunction was less commonly reported in Oxiplex subjects compared with Control subjects. Hypoaesthesia was reported in 10.2% (n=18) of Oxiplex-treated subjects compared to 14.9% (n=26) of Control subjects. There were no subjects in the Oxiplex group with a CSF leak compared to one in the Control group.

- **Fewer musculoskeletal abnormalities** – Oxiplex subjects had fewer abnormal musculoskeletal physical exams than Control subjects (15.7% vs. 24.3%, respectively).

Safety Profile

In the prospective, multi-center, randomized, third-party blinded parallel-group, 352-patient U.S. pivotal clinical trial comparing Oxiplex-treated patients (n=177) to surgery only (n=175), to assess the safety and effectiveness of Oxiplex spine gel to reduce postsurgical pain in patients undergoing single-level laminotomy, laminectomy, or discectomy at L4-L5 or L5-S1.

- **In all study patients (Oxiplex N=177, Controls N=175) there were:**
 - No significant difference in adverse events and serious adverse events between Oxiplex & Control groups. No adverse events led to discontinuation of any subject or discontinuation of the study.
 - No serious adverse events related to Oxiplex.
 - Fewer neurological abnormalities in Oxiplex group compared to Control group.
 - Fewer musculoskeletal abnormalities in Oxiplex group compared to Control group.
 - Fewer reoperations in Oxiplex group compared to Control group (1 vs. 6).

In independent studies, excellent safety related to the use of CMC/PEO spine gels.^{6,7,8,9}

In pre-clinical studies, reduction of epidural fibrosis was accompanied by normal bone healing and CMC/PEO gels did not inhibit dural healing.^{10,11}

¹ Blumenthal S, et al. Oxiplex reduces the incidence of back pain, leg pain and associated symptoms 6 months following single-level lower lumbar surgery for removal of herniated disc. Poster presentation, SpineWeek Geneva, Switzerland, 2008.

² Arnold P, et al. Oxiplex gel reduces neurological sequelae following lumbar surgery. Poster 1147, American Association of Neurological Surgeons (AANS), Chicago, IL USA 2008.

³ Kim KD, et al. Multicenter clinical study evaluating Oxiplex in lumbar surgery. Presentation (abstract no. 73), Congress of Neurological Surgeons (CNS) 2008.

⁴ Wang JC and Arnold P. Oxiplex reduces the incidence of back pain, leg pain, and associated symptoms 6 months following single level lumbar laminectomy for removal of a herniated disc. Presentation, North American Spine Association (NASS) 2008.

⁵ BenDebba M, diZerega GS, Long DM. The Lumbar Spine Outcomes Questionnaire: its development and psychometric properties. Spine J, 7:118-132, 2007.

⁶ Fransen P. Safety of carboxymethylcellulose/polyethylene oxide for the prevention of adhesions in lumbar disc herniation – consecutive case series review. Ann Sur Innov Res, 2:2, 2008.

⁷ Assietti R. New treatments for the reduction of leg pain and lower-extremity weakness. *Euro Musc Rev*, 1, March 2007.

⁸ Guizzardi G, et al. Use of a novel gel-formulated anti-adhesion barrier for prevention of fibrotic adhesions, in lumbar microdiscectomy procedures. Presentation, Congress of Neurological Surgeons (CNS) 2006.

⁹ Assietti R, et al. Use of carboxymethylcellulose/polyethylene oxide gel in microdiscectomy with interlaminectomy: A case series comparison with long-term follow-up. *Spine*, 33 (16): 1762-1765, 2008.

¹⁰ Rodgers, KE, et al. Reduction of epidural fibrosis in lumbar surgery with Oxiplex adhesion barriers of carboxymethylcellulose and polyethylene oxide. *Spine J*, 3:277-284, 2003.

¹¹ Rodgers KE, et al. Evaluation of FzioMed adhesion barrier gel on dural healing in a model of epidural fibrosis in rabbits. Poster, Congress of Neurological Surgeons (CNS), Denver, CO USA, 2003.