

## Biodegradable Polymers in Spinal Surgery - Posterior Lumbar Interbody Fusion with Resorbable Polymer Interbody Cage. Case Report.

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**INTRODUCTION:** We describe a case report of a patient who underwent instrumentation-assisted posterior lumbar interbody fusion with resorbable polymer cages and autograft bone for segmental instability and stenosis of the lumbar spine, and who was the first in Czech Republic treated with resorbable spinal interbody implant.

Bioresorbable polymers have been advocated recently as replacement for metal, carbon fibre and non-resorbable polymeric materials in spinal surgery. These implants can reduce stress shielding having a better match of strength and elasticity to bone [1]. In addition, resorbable polymers are radiolucent, it can facilitate radiographic and neuroimaging analysis of the interbody fusion status.

**METHODS:** Our patient was fifty-four years old man, with a history of fifteen years lasting low back pain with irradiation to inguinal region bilaterally. Objectively he suffered polyradicular sensitive lesion of L3-S1, and light motoric lesion of L2 and L3 bilaterally. X-rays, computed tomography (CT) and magnetic resonance (MRI) of the lumbar spine showed monosegmental L2/3 degenerative changes with disc protrusion and ligamentous hypertrophy in this segment, with pathological motion on dynamic X-rays.

**Operation:** we performed decompressive laminectomy of L2, monosegmental transpedicular fixation of L2-3 segment, discectomy L2/3 and posterior lumbar interbody fusion with two resorbable cages Telamon™ Hydrosorb™ (Medtronic Sofamor Danek) (Fig.1) filled with autograft bone chips from the resected lamina.

The follow up period is twenty four months to date. Subjectively our patient has no pain; he is able to do jogging for long trails from 5 to 15 kilometers as before his problems started. Neurological findings are normal.

**DISSCUSSION:** Non-surgical therapies of low back pain are usually unsuccessful for certain injuries and pathologies including degenerative disc disease, stenosis, spondylolysis, and spondylolisthesis. When conservative treatment fails, spinal fusion may be performed.

In our case we used a cage, which consist of 70/30 D,L-poly lactid acid. Polyhydroxy acids are the best known and most studied resorbable polymeric materials for implantation [2].



*Fig.1 Resorbable polymer spinal interbody cage*

The implant slowly degrades by bulk hydrolysis over an 18 to 36 month period, which allows anterior column structural support to gradually shift from the implant do the maturing interbody fusion mass.

In contrary some authors [3] declare, that the disintegration of a polylactid into particles with a very slow hydrolytic degradation rate can induce and maintain a clinically detectable swelling. This fact could imply these polylactid particles can no longer be considered to be fully biocompatible.

We had not found any signs of swelling near the implants, but it was evaluated by CT scans only.

**CONCLUSION:** Early results mentioned in the literature are encouraging, but clinical evaluation is underway. We suppose next studies will show resorbable polymers fully biocompatible and promising spinal interbody devices.

**REFERENCES:** <sup>1</sup> A.R.Vaccaro and L.Madigan (2002) Spinal applications of bioabsorbable implants. *J Neurosurg (Spine 4)* **97**:407-412. <sup>2</sup> S.Gogolewski, M.Jovanovic, S.M.Perren et al. (1993) Tissue response and in vivo degradation of selected polyhydroxyacids. *J Biomed Mater Res* **27**:1135-1148. <sup>3</sup> J.E.Bergsma, W.C.de Bruijn, F.R. Rozema, et al (1996) Late degradation tissue response to poly(L-lactide) bone plates and screws. *Biomaterials* **16**:25-31.