

Special Gel Speeds Up Recovery in Cementless Hip Replacement

Physical Therapy in Twin Falls and Buhl for Hip

There's one good way to find out if something new is working. Try it on a group of people and compare it to a second group who didn't get the same thing. That's what senior orthopedic surgeon W. Thomas, MD from Rome, Italy did. He used a special osteoconductive gel over the surface of cementless hip replacement implants in 60 patients and compared results with 60 patients who got the same implant without the gel.

Osteoinductive means fosters bone growth. And that's exactly what this gel does -- it contains proteins that act as growth factors to stimulate bone growth. This new gel is made up of bone chips, platelet-rich plasma (the growth factors), and bone marrow. Bone marrow contains stem cells that can form into any other cell, including new blood and bone cells needed to form new bone tissue.

Cementless implants are press-fitted into the bone. They are held in place by the porous (roughened) surface of the implant next to the bone. During the natural process of healing, the inflammatory process brings new blood cells to the surgical site and the stem cells form new bone cells to fill in and around the implant. Growth factors speed up the whole process.

With the osteoinductive gel, the hope is that the process will not only be faster, but also provide joint stability sooner. This could mean patients can get back to full function as soon as possible with fewer complications. And since the gel is made up of the patient's own body parts, it's safe from rejection or transfer of diseases from someone else. At this point, you might be wondering how do they harvest the patient's cells?

When the old, arthritic hip joint is taken out, the bone marrow from inside the upper shaft of the femur is collected. The top of the femur and the hip socket (also removed in preparation for the new implant) are ground up and used as bone stock. The bone is rich in bone cells that promote bone growth. The bone stock also contains morphogenetic protein, another type of growth factor. Once the gel is all mixed up, it is smeared all over the implant socket and stem before inserting these into the patient's hip.

After surgery, everyone was treated the same. They all started muscle strengthening exercises right away and were up and standing within 24 hours and walking within 48 hours. Crutches were used to assist the patient in the first few weeks to a month. Patients were allowed to go from two crutches to using only one crutch at the end of the first four weeks. A single crutch was used for another couple weeks up to a month (depending on the patient's progress).

The results were very good. Although the operation took longer for patients receiving the gel, there was less blood loss and a faster recovery by all measures. There were no major complications reported. Outcomes were measured and compared using special X-rays called dual energy x-ray absorptiometry (DEXA) to view the healing bone. You may have heard of DEXA scans used to measure bone density as a test for osteoporosis. The more sophisticated machines used to look inside the body at the hip were used in this study. Comparing DEXA scan results for both groups, the gel group had significantly faster bone growth in the first 40 days after surgery. By the end of three months (90 days), bone growth was equal between the two groups.

A second measure was made using a test of function called the Harris Hip Score. The gel group doubled their functional score in the first 40 days with a gradual progression of improvements from then up through the first six months. Similar results were observed in the control group (no gel) but with a lower level of improvement noted after 40 days. In both groups, functional improvement reached a plateau and did not change further by the end of the 12-month post-operative period.

What does this all mean and why is it important? With the osteoinductive gel, cementless implants can get integrated into the bone.

the bone much faster. In doing so, the risk of fibrous (scar) tissue filling in between the implant and the bone is much less. That creates a more solid, stable joint to handle weight-bearing loads of adults who want to move, walk, and play! Bony fixation is improved with the bone stimulating gel, which in turn, decreases the risk of implant failure.

Bottom-line? The authors say faster functional and clinical recovery within six months. You can't argue with that!

Reference: Wolfram Thomas, MD, et al. Osteoinductive Gel in Cementless Hip Joint Replacement: A Randomized Prospective Study. In *Current Orthopaedic Practice*. November/December 2009. Vol. 20. No. 6. Pp. 655-659.