

Researchers find clues that may predict recovery outcomes following total hip replacement

May 4 2015, by Stacy Brooks

Surgery to replace the arthritic hip and knee joints is on the rise in the U.S., with more than 1.1 million replacement surgeries reported in 2009. While these surgeries improve pain, mobility and quality of life for most recipients, some patients are dogged by persistent muscular problems. Now, a cross-institutional team of researchers has found that a patient's susceptibility to muscle inflammation may be a measurable marker that can be used to predict how well that patient will recover from joint replacement surgery and to identify those patients who may be in need of a specialized rehabilitation plan.

Severe osteoarthritis is the most common reason for having an elective hip replacement. However, some [patients](#) need the surgery because they have suffered an acute injury, such as a car accident, that requires them to have a hip replaced. Total [hip replacement](#) surgery—also known as [total hip arthroplasty](#) (THA)—is an invasive surgical procedure that causes significant damage to the surrounding muscle. The muscle's ability to regenerate is critical to a patient's post-surgery outcome, and healthy muscle has a much better chance of repairing itself. Chronic inflammation, however, is known to inhibit [muscle repair](#). Therefore, the presence of inflammation in the muscle that surrounds a diseased joint may be a sign of problems to come following [joint replacement surgery](#).

To measure the relative inflammation levels and make predictions about the type of patients that would have a harder time recovering from hip

surgery, the research team conducted two studies. The first compared two types of hip surgery patients—those having surgery due to osteoarthritis (THA) and those who needed surgery due to a trauma that caused hip fracture (HFX)—with healthy control subjects to measure levels of inflammation near affected muscles and throughout the body. The researchers found that the HFX group had higher system-wide levels of inflammation than the THAs or controls, and that many of the THA group's measurements were not significantly different than the control subjects.

In the second study, researchers measured the presence of TNF-like weak inducer of apoptosis (TWEAK), a substance that signals impaired muscle tissue formation and increased loss of muscle mass, among the THA patients. The presence of TWEAK suggests that an individual may have high [muscle inflammation](#) susceptibility (MuIS), a characteristic that may predict patients who will have poor muscle regeneration outcomes following [hip surgery](#). THA patients were divided into positive (MuIS+) or negative (MuIS-) groups based on the amount of inflammation in the gluteus maximus—the muscle that surrounds and supports the diseased hip. Researchers found that MuIS+ patients had significantly higher levels of inflammation and suppressed muscle regeneration before surgery than the MuIS- patients.

"The results suggest MuIS status at the time of surgery may be a powerful determinant of recovery potential independent of age and BMI," the researchers wrote. "We suspect MuIS+ patients may be in need of a rehabilitation program that is more intensive...than usual care to overcome MuIS. If this proves to be the case, identifying MuIS+ patients at the time of surgery may enable clinicians to make an informed decision regarding post-surgery rehabilitation, essentially facilitating a personalized rehabilitation medicine approach."

More information: "Muscle inflammation susceptibility: a prognostic

index of recovery potential after hip arthroplasty?" *American Journal of Physiology - Endocrinology and Metabolism* Published 15 April 2015
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