

Navigational surgery pinpoints procedure for hip replacement

Dr. Bal in the News

B. Sonny Bal, MD, a joint-replacement specialist at University of Missouri Health Care, recently performed the first image-guided minimally invasive hip-replacement procedure in the Columbia area.

The surgery, known as MIS two-incision hip replacement, involves implanting the artificial hip components through two small incisions, rather than one large one. Traditional hip-replacement procedures require incisions from six to twelve inches in length to access the joint. By using radiographic markers on the bone surrounding the diseased hip, fluoroscopic image guidance can locate the exact area in need of repair. More important than the size of the skin cut is the fact that none of the underlying muscles or tendons in the hip are cut during this new procedure, leading to faster recovery.

Image guidance and navigational guided hip surgery (NGHS) acts much the same as a global positioning system (GPS), but adapted to the human anatomy. Software tools allow precise prediction of the size and position of the implants prior to the surgery, and image guidance then acts as the surgeon's eyes to "see" inside the patient in order to position the artificial joint. These technologies allow for unprecedented precision through smaller incisions, and reduce the risk of early problems, repeat surgeries and healing time.

"In the past, a patient undergoing hip replacement could expect a long hospital stay, and an even longer rehabilitation to activate traumatized muscles" said Bal. "But now, that stay has been reduced to only one to three days, depending on the overall health of the patients. Among the most active areas of interest in clinical orthopaedics is minimizing trauma to the tissues during joint replacement surgery."

Along with hip replacement, Bal also performs several different methods of corrective knee surgeries. One of the newest is a unicompartamental component he is designing in collaboration with Jonathan Brown, an engineering graduate student at MU.

"We're using ceramic materials to create a component that is not only durable, but will also require a smaller incision by developing unique instrumentation to implant the device," said Bal.

Bal intends to incorporate a similar navigational-guided technique to his total knee- replacement surgery in order to further reduce the length of the incision. The goal of the MIS knee-replacement surgery will be to spare the quadriceps muscle entirely, thereby improving both the recovery time and the ultimate range of motion of the knee after surgery. Clinical trials for this procedure are scheduled to begin in the Fall of 2003, while the two-incision hip replacement is already being performed by Bal at Columbia Regional Hospital.

"We've got the incision for knee surgery down to four inches now, which is half the length it used to be," said Bal. By using navigational surgery, we're hoping to cut the length even more. As with the hip, ultimately it is the sparing of the underlying tendons and muscles that accelerates recovery, even more so than the size of the skin cut."

Further information about the 2-incision MIS hip replacement can be found at www.pacewithlife.com and www.zimmer.com Web sites.