

Technology key in joint replacement surgery

Dr. Bal in the News

It may seem that every day brings new medical conundrums and research findings. Believe it or not, all of it is useful and will eventually affect everyone down the road. Medical research and technology is a topic of great interest not only for the media, but for those in the health-care industry and the general public as well.

For the past 25 years, major advancements in hip and knee replacement have improved the outcome of the surgery greatly. Since the overall population of the world is aging, these procedures are becoming more and more common and technology is helping surgeons keep up to date in correcting patients' ailments.

According to B. Sonny Bal, M.D., a joint replacement specialist at University of Missouri Health Care, the growing demand for complex, precise, and minimally invasive surgery continues to drive the search for ways to use computers for linking research, implant design, preoperative ideas, and human tools.

"Combining advanced research, technology and the human application process, has given surgeons and patients options that were not previously available," Bal said.

While the deterioration of joints is not a new phenomenon, the options to treat the condition are ever-changing and progressing. In the past, those suffering from massive arthritis in the hip underwent hip-replacement procedures that involved incisions from 10 to 18 inches in length, and considerable blood loss in order for the surgeon to access the joint.

Today, Bal and his colleagues offer a new minimally invasive procedure that involves computer-assisted technologies. By using the electronic markers on the bone surrounding the diseased hip, a computer can locate the exact area in need of repair.

Navigational guided hip surgery (NGHS) acts as a global positioning system (GPS) for the human body. The computer-assisted tool allows the surgeon to see inside the patient in order to position the artificial joint, by using only a 3-4 inch incision. The accuracy of GPS and the smaller incisions help reduce the risk of early complications, repeat surgeries and a patient's healing time.

"In the past, a patient undergoing hip replacement could expect an almost month-long hospital stay," Bal said. "But now, the stay has been reduced to a mere three to four days. There is a very active area of research into technologies that can reduce hospital stays and accelerate recovery following joint replacement surgery."

There are many conditions that can result in degeneration of the hip and knee joints. Osteoarthritis, dubbed the 'wear and tear arthritis,' is perhaps the most common cause for hip and knee replacement surgery. This condition can occur with no previous history of injury to the joint – the cartilage simply wears down to bone.

Avascular necrosis is another cause of degeneration of the hip joint, and sometimes the knee joint. In this condition, the femoral head (the ball portion) loses a portion of its blood supply and actually dies. This leads to collapse of the femoral head and degeneration of the joint. Finally, abnormalities of hip joint function resulting from fractures of the hip in childhood can also lead to degeneration many years after the injury.

"The symptoms of a degenerative hip usually begins with a pain that occurs when a person puts weight on it,"

Bal said. "They may limp, which is the body's way of reducing the pressure that the hip has to deal with."

The degeneration will eventually lead to a reduction in the range-of-motion of the affected hip. Bone spurs will usually develop which limit movement of the hip joint. Finally, as the condition becomes worse, the pain may be present all the time, leading to sleepless nights.

"Just because a person presents with some symptoms does not mean they require hip or knee replacement surgery. However, they should talk to their doctor, have a complete physical and an X-ray taken. Most importantly, they should take the time to educate themselves about the procedure." Bal said.

Since the discovery of X-rays, medical imaging has played a major role in the guidance of surgical procedures. While it did begin with simple X-ray plates to indicate the presence of foreign objects within the human body, the advent of the computer continues to be a vital factor in the development of the medical field. This, in turn, does affect everyone down the road.