Minimally invasive transplantation of cartilage cells into the hip joint

The Orthopaedic & Traumatic Surgery Centre at the Mannheim Medical Centre is coordinating two studies on the proliferation and transplantation of cartilage cells. Artificial cartilage cells have been transplanted into a patient's defective hip joint in a minimally invasive intervention.

The orthopaedists from Mannheim have long-standing experience in the transplantation of chondrocytes (cartilage cells) into the knee. They are also the first doctors in Germany to have implanted a chondrocyte transplant into the hip, initially during open surgery and, around two months ago, in a minimally invasive surgical intervention using arthroscopy. "We regard it as a great honour to be assigned the coordination of two chondrocyte transplantation studies, as this shows that our work is recognised and valued," said Prof. Dr. Hanns-Peter Scharf, Director of the Orthopaedic & Traumatic Surgery Centre. The senior physician Dr. Stefan Fickert describes their task as follows: "In the first study, which will take five years to complete, we will compare the new method of chondrocyte transplantation with a more traditional method." All investigations will focus on preventing or at least delaying the implantation of an artificial knee joint, otherwise known as an endoprosthesis. "Since the extent of the cartilage defect plays an important role in these investigations, the second study will focus on assessing the optimal quantity of in vitro cartilage tissue required to repair the damage."

The patient who has undergone minimally invasive chondrocyte transplantation is a 26-year-old medical student, a trained paramedic and amateur ice hockey player. This patient had to undergo hip surgery due to another disease: Returning home from a night shift with the paramedic team, he was barely able to go up the stairs to his third-floor flat due to severe pain. He was admitted to hospital where orthopaedists operated on his hip that had become displaced, resulting in the femur bone sliding onto the hip bone. This kind of displacement is relatively frequent, and often happens when the bones are under strain. Trained surgeons are able to correct this displacement by deepening the femur bone at the site where it is at risk of striking the hip bone.

During the surgical intervention, the surgeons discovered another hip defect: the cartilage of the hip joint had become detached and was severely damaged.
Fortunately for the patient, modern medicine is able to remove cartilage tissue and proliferate it in vitro, a procedure that has already been frequently applied to knee joints, and which has now been used five times to restore damaged hip joint cartilage at the University Medical Centre Mannheim. However, the transplantation of new tissue usually entails a complex surgical intervention, which can take several hours.

The transplantation was carried out around two months ago, and the team of surgeons from Mannheim led by Dr. Stefan Fickert chose to apply the arthroscopic implantation of the tissue graft. This minimally invasive method involves the use of an applicator, a thin, bendable pin, to apply the carrier substance along with the cells grown outside of the patient's body. "I believe we are the first medical team to have used this technology to transplant hip joint cartilage," said joint specialist Fickert after the successful surgical intervention.

It was possible to reduce transplantation time to around one hour, which is less than half the time normally required for cartilage graft transplantation. In the operation carried out at Mannheim, there was no need to cut through muscles, as is always the case with standard surgery. On the day he had the surgery, the 26-year-old was out of bed and able to move around slowly around on crutches and he left hospital four days later. Two months after surgery, he is continuing his medical studies and leisure pursuits without any problems.