

Autologous Chondrocyte Transplantation



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You have an articular cartilage injury. Articular cartilage does not have a natural ability to heal. If left untreated, the damage may spread to surrounding healthy cartilage and lead to further deterioration of your knee. Osteoarthritis may develop

Autologous chondrocyte transplantation is a new technique that enables surgeons to transplant your own (autologous) cultured cartilage cells back into the damaged area.

This technique has been shown to have significant benefits in patients with large symptomatic cartilage defects. It is not indicated for osteoarthritis.

The technique was developed in Sweden in the early 1990's and has been popularized in the United States, Europe and Australia over the last fifteen years. Approximately 25000 cases have been performed world wide. Studies show encouraging results however this technique remains experimental. Initially cartilage cells were injected under a layer of periosteum. In the last fifteen years the second generation technique has been developed where the cells are embedded in a scaffold. I will use this technique

Autologous chondrocyte transplantation has recently approved by ACC in selected cases. It is a very expensive technique. It costs approximately \$10,000 to grow the cells alone

Technique:

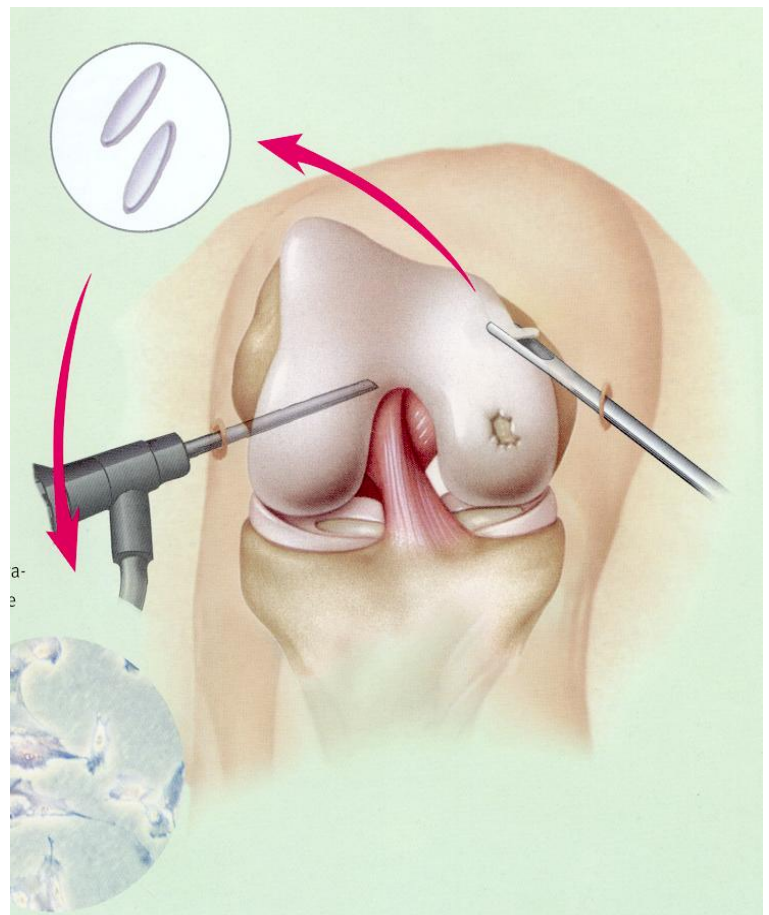
This is a two stage technique

Stage 1:

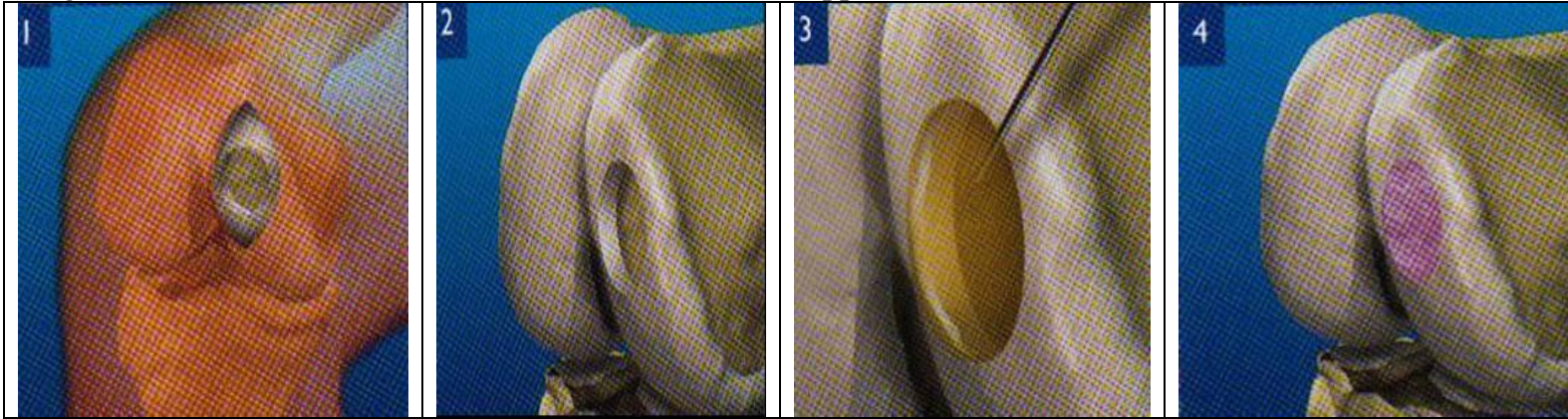
An arthroscopy (key hole surgery) is performed to ensure you are a suitable candidate for the technique then a small cartilage biopsy (two Tic Tacs) is removed from your knee

The cartilage is then sent to the Genzyme laboratory in Perth, Australia. They extract chondrocytes from the biopsy and over a 3-4 week period grow approximately 15-20 million cells.

These cells are then implanted in a bioabsorbable three dimensional scaffold which is sent back to us ready for transplantation into your knee



Stage 2 - When the cells have returned from Australia – approx 8 weeks



- 1 A small incision is made over the damaged area of cartilage
2. The damaged area is cleaned so only healthy cartilage remains
3. A special glue is placed in the base of the damaged area to attach the scaffold
4. The scaffold with the cartilage cells embedded is placed in the damaged area

Rehabilitation:

This is a critical part of the success of the surgery.

The chondrocyte graft takes a long time to mature. In the first 3 months the cells attach and grow. In the next 3 months the graft is gelatin like. The following three months it is putty like and it is not as firm as the surrounding cartilage for 12 – 18 months. Thus you must obey instructions.

For the first six weeks you are on crutches just touching the leg to the ground. Over the next six weeks you increase the weight through the leg. It is important to use a skateboard and exercycle to move the knee as much as possible and to undergo physiotherapy to maintain motion and muscle strength. Generally low level activities such as walking, jogging and biking can be commenced at 6 months however sports that involve pivoting, twisting and side stepping such as rugby, soccer, netball, basketball and tennis must be avoided for 12 – 18 months

Follow up:

ACC have only agreed to this under very strict criteria. I will be performing the surgery for all patients in New Zealand and we will be evaluating you very closely with follow up visits and outcome scores. For ACC to fund the surgery you must agree to return for all visits and have a relook arthroscopy and biopsy three years from surgery so we can determine the status of your graft

Results

This technique has been developed to treat a difficult problem which until recently we have been unable to improve effectively. Thus it is important to have realistic expectations. Studies show a significant improvement in pain and function is seen in 70 – 80% of patients. Thus it is likely that this operation will improve your knee however it is unlikely to be normal.

Complications

Complications can result from this surgery these include graft delamination, graft failure, graft overgrowth, infection, inflammation, stiffness, wound problems and numbness around the scars