

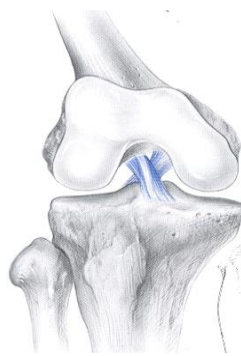
AUTOLOGOUS CHONDROCYTE IMPLANTATION OF THE KNEE **PATIENT INFORMATION SHEET**

INTRODUCTION

It has been suggested that an autologous chondrocyte implantation (ACI) may be appropriate for the problem with your knee. This information sheet is intended to provide you with information about the problem you have and the surgery which has been recommended. It will include a brief explanation of what is meant by a chondral or osteochondral lesion, a description of the surgical procedure called ACI and what will happen post-operatively and through your rehabilitation.

IT IS IMPORTANT TO NOTE THAT WHILE THIS TYPE OF SURGERY IS PROVING TO BE VERY BENEFICIAL TO PATIENTS, THE TECHNOLOGY IS NEW AND IT IS NOT DESIGNED TO RETURN PATIENTS TO TWISTING, CONTACT, PIVOTING AND IMPACT SPORTS. IT IS DESIGNED TO PROTECT JOINTS FROM DETERIORATION.

WHAT ARE CHONDRAL AND OSTEOCHONDRAL LESIONS?



Articular cartilage is the covering of the bones in the knee (should not be confused with the meniscal form of “cartilage”, which are the “shock absorbers” of the knee). It is glossy white in appearance with a firm consistency and some elasticity.

Articular cartilage serves as the load bearing material of joints with excellent friction, lubrication and wear characteristics. It allows smooth movement and can adapt to variable loads and impact. Although it is only a few millimetres thick it can be extremely resilient to force.

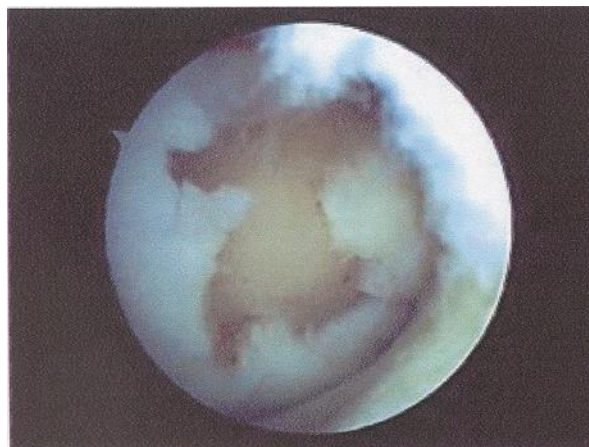
Mechanical injuries to articular cartilage occur with either repetitive and prolonged joint overloading or sudden impact, producing high forces through the tissue to the junction of the deeper underlying bone.

“*Chondra*” means cartilage and “*osteo*” means bone. A chondral lesion is thus a defect of cartilage alone whereas an osteochondral lesion is a defect involving the underlying bone as well as cartilage.

It is known that articular cartilage has a very limited ability to repair itself and therefore many techniques have been devised to help stimulate repair from the deeper underlying bone and prevent further degeneration, or alternatively to provide replacement forms of articular cartilage.

Chondral and osteochondral lesions do not always cause pain and that is why an accurate diagnosis is necessary. Exactly the same lesion can be completely painless in one patient whilst very painful in another.

Diagnosis of articular cartilage lesions can be difficult as clinical examination, x-ray and MRI have in general a low sensitivity for these problems. Arthroscopy (“keyhole surgery”) is the most accurate diagnostic tool as this allows the surgeon to directly visualise and probe the articular cartilage which can be very soft or has become semi-detached from the underlying bone.



Arthroscopic appearances of an osteochondral lesion

Early damage to the articular cartilage of joints is common in active young men and women who also play sport. This can lead to pain, loss of function and an inability to do everyday activities as well as sport. The damage can also lead over the years to further breakdown of the cartilage lining of the joint resulting in early osteoarthritis. Young patients are not suitable for knee replacement as they wear out in time or break loose from bone. This may mean pain from the joint and restricted activity until you are old enough or your pain is severe enough to be suitable for a knee replacement operation. The cartilage grafting methods proposed may be able to heal your joint to give relief of symptoms and return of function and may also prevent early osteoarthritis.

The treatment period is for two years with initially an out-patient consultation, x-rays and MRI scan of the knee followed by an arthroscopy under general anaesthetic to check if your knee is suitable for ACI cartilage grafting. If the knee is suitable for grafting then under the same anaesthetic a small piece of articular cartilage (approximately 1cm by 2cm) is taken from the edge of your knee joint and cultured in the laboratory for 4-6 weeks. You should be able to return to normal activities within one week of this first operation.

The second operation after 4-6 weeks is an open operation on the knee and the cells are implanted into the damaged area. After the operation you will walk the next day using crutches placing weight through the knee as tolerated. A fibre-glass cylinder cast from ankle to groin will be applied with the knee in full extension (straight). You will be able to go home 1-2 days after the operation. Approximately 7-10 days after the operation you will need to return to the hospital to have the cast removed and at that stage you will start your physiotherapy programme – this programme is designed to mobilise the strengthen the muscles around the knee but avoiding excessive stresses on it,

particularly twisting. This physiotherapy need not be at your treating hospital – it can be carried out by a physiotherapist close to your home or work.

You will need to be reviewed at 6 weeks, 12 weeks, 6 months, 9 months and 12 months from the operation. During that time you should be able to carry out normal activities of daily living. You should be able to return to sedentary work within 2-4 weeks and more physical work 6 weeks from the second operation. Please specifically ask your Consultant about an accurate prediction of the time you will need to take from work with respect to your own occupation. You will need to use crutches for 3 weeks after the operation, but you will be encouraged to take weight on the leg. After the wound has healed, at about 10 days you should be able to return to static cycling and light gym exercises. More intense gym activities follow at about 6 weeks but you are advised to avoid running and contact sports for approximately 12 months from the time of implantation.

At 12 months from the implantation operation it will be necessary to repeat the x-ray of your knees, repeat the MRI scan and repeat the arthroscopy to check the state of the repair of your cartilage graft. You are however under no obligation to undergo this arthroscopy, but it does help to know how solid the graft is and whether it has taken. Sometimes it overgrows and needs to be shaved back. In some cases it may be necessary to repeat the arthroscopy at 2 years post-implantation for a final check on the cartilage repair. The reason for this is that we have realised that the graft still continues to mature even over 1 year post-operatively.

REQUIREMENTS FOR SURGERY

Autologous chondrocytes implantation (ACI) is appropriate for defects approximately up to 5cm by 5cm in area. It is not appropriate for large areas of degenerative arthritis. You will need to have a full range of motion in the knee and good quadriceps (thigh muscle) tone prior to surgery. In the run up to surgery, try to avoid any stressful activities which involve

twisting or pivoting on your knee as this may cause your knee to become swollen. If your knee is swollen at time of operation or does not have full range of movement it may lead to a poorer outcome.

THE INITIAL ARTHROSCOPY

The initial arthroscopy is a completely standard procedure – a patient information sheet describing this operation is available to you from the clinic.



IT WOULD BE HELPFUL IF YOU COULD SHAVE THE AREA SURROUNDING THE KNEE PRIOR TO YOUR ADMISSION. THIS SPEEDS UP THE ADMISSION PROCESS AND MAKES IT EASIER FOR YOU AND THE WARD STAFF. IF PRIOR SURGERY HAS ALREADY TAKEN PLACE, THIS MAY ALREADY HAVE BEEN DONE.

THE DAY OF SECOND STAGE SURGERY FOR THE ACI (IMPLANTATION)

THIS IS THE SECOND STAGE AND TAKES PLACE AT ABOUT 4-6 WEEKS AFTER THE INITIAL ARTHROSCOPY, WHEN THE CARTILAGE IS HARVESTED.

You will be admitted on the day of your surgery. You will be advised as to what time to stop eating or drinking, usually about 6 hours prior to the operation.

Your surgeon will always see you on the day of your operation and answer any last minute questions you may have. Once again you will be asked to sign a formal consent form and the leg to be operated on will be marked.

The anaesthetist will also visit you on the day of surgery to explain the anaesthetic and any post-operative pain control and answer any questions you may have.

When you wake up from your operation in recovery (the area of the operating theatre which allows you to recover from an anaesthetic safely) there will be a plaster cast on your leg with the leg straight. You will return to your room and rest in an elevated position until the next day.

FIRST POST-OPERATIVE DAY

A physiotherapist will commence active exercises to help increase quadriceps strength within the plaster cast. You will be assisted out of bed and start mobilising with a pair of elbow crutches in the cast.

SUBSEQUENT IN-PATIENT STAY

For the first 3 weeks after surgery weight bearing through your operated leg will normally be as tolerated

You will normally be discharged from hospital 1-2 days after surgery when you are safe on crutches and your Consultant and physiotherapist are happy with your mobility, pain control and general state of being. You will be able to negotiate stairs on crutches before you go home.

AFTER DISCHARGE FROM HOSPITAL

You will need to return to the outpatient clinic for removal of the cast and a dressing change approximately 7-10 days after

surgery. At this time you will be assessed by your Consultant, and physiotherapy is started formally at this stage. You will need to see a physiotherapist within a few days of this visit to commence the rehab program. You should have received a rehab protocol from the physiotherapist in the ward, which you can give to your physiotherapist. If you did not, Mr Vardi can supply you with it. Please contact him if this is the case.

You should be able to return to driving 2-4 weeks after surgery (if you drive an automatic car and the surgery is on the left knee then you may be able to drive immediately).

Most patients in sedentary occupations take 2-6 weeks from work, the time taken largely depending upon the mode of transport to work. In manual occupations the period of time from work may need to be longer.

It will take approximately six months to fully recover from the operation. This does not mean that you will be significantly inconvenienced for this long but swelling from the operation itself may take some time to settle down. Very few operations on the lower limb settle within six months, except perhaps relatively minor arthroscopic surgery, which in itself may take up to three months.

POSSIBLE COMPLICATIONS

There is no surgical procedure in existence that is free from complications. Although ACI has a good record, complications can occur.

Complications include;

Stiffness of the knee. The knee may have difficulty in achieving full extension or flexion. This is minimised by early physiotherapy, and to some extent requires a degree of effort on your part to do your exercises. In some patients, a manipulation

under anaesthetic or an arthroscopy may be required if the knee becomes stiff.

Persistent pain in the knee over the area of surgery especially on weight bearing activities. There may be persistent numbness around the area of the incision. This is caused by the surgical cut which divides the small sensory nerves to the skin in that area. Usually it resolves and the sensation returns to normal, but it may take a long time and in some patients the numbness or altered sensation stays.

Persistent swelling of the knee, again mainly after weight bearing activities.

Venous thrombosis (“blood clots in the veins”). Every attempt is made to minimise this complication, although heparin is not routinely given. It is advised that patients should not be taking the oral contraceptive pill for six weeks prior to surgery. Finish your current packet and take other contraceptive precautions until after your operation. It is also advisable not to be taking hormone replacement therapy (HRT) at the time of surgery. Please ask for advice if necessary.

Infection of the knee – this is a rare but serious complication. Antibiotics are given during and shortly after the operation to minimise this risk.

Please contact the hospital at which you underwent surgery if you are at all concerned that there is a problem. In particular, act immediately if you develop a fever, severe pain or significant wound problems. You do not need to contact your GP (unless you wish to do so) as Mr Vardi is always available to see you at short notice in case of an emergency. You will be given his mobile telephone number.

HOW SUCCESSFUL IS THE OPERATION?

Whilst not a complication in itself, in a number of patients the operation does not fully relieve the symptoms that were present

prior to surgery. The pain may not be relieved or may only partially be relieved. Unless there is a specific complication as described above, even with failure the knee should be no worse after surgery than before.

In many ways the success rate of the surgery depends upon how bad the defects or lesions were before the operation. However in general terms the success rate for the “average” isolated 2cm by 2cm lesion is 70% “cure” and 85% “improvement” in symptoms in the longer term.

You will have been recommended surgery only if the potential benefits of the operation outweigh the risks. If you have any questions or queries in this regard, please do not hesitate to let your Consultant know.

WHAT IS THE X-RAY EXPOSURE OF YOUR KNEES?

The x-rays of your knees are standard and involve a dosage of 90-100cGcm² per exposure (which is a very low dose and much lower than a standard chest x-ray). MRI scans do not involve any radiation and are often needed to assess the joint pre and post-operatively.

WHAT ARE THE POSSIBLE SIDE-EFFECTS OF THE TREATMENT?

The chances of a specific complication from the treatment are very small. The possible complications include infection and deep venous thrombosis, and the risks of these occurring are very small. It is very unlikely that you would be made worse by the operation but the result cannot be guaranteed. The success rate depends on the degrees of damage to your knee and can be estimated as 60-80% on average.

IT IS RECOMMENDED THAT YOU DO NOT UNDERTAKE ANY AIR TRAVEL FOR 4 WEEKS AFTER THE FIRST STAGE AND 6

**WEEKS AFTER THE SECOND STAGE OF THE SURGERY.
THERE IS A RISK OF DVT (DEEP VEIN THROMBSIS – CLOTS IN
THE VEINS OF THE LEGS). PLEASE DISCUSS THIS WITH ME IF
YOU HAVE ANY PLANS TO TRAVEL.**

A handwritten signature in brown ink, appearing to read 'Glen Vardi', written in a cursive style.

**Glen Vardi FCS.SA.ORTH
CONSULTANT ORTHOPAEDIC SURGEON**