Osseointegration Prosthetic Limb
Patient Information
Introduction

Osseointegration is derived from the Greek ‘osteon’ meaning bone, and the Latin ‘integrare’, which means to make whole. It is defined as the direct contact between living bone and the surface of a load bearing implant. Osseointegration has not only dramatically enhanced bone and joint replacement surgery but also improved the quality of life for amputees.

Clinically, it has been used since 1995, utilizing a skeletally integrated titanium implant, which is connected through an opening in the stump to an external prosthetic limb. This allows direct contact to the ground, which provides greater stability, more control and minimizes energy exerted. A poorly fitting socket can increase an amputee’s energy consumption by 100%.

The Osseointegration Group of Australia Accelerated Protocol (OGAAP) is an organisation founded by Sydney Orthopedic Surgeon Associate Professor Munjed Al Muderis. The group consists of a highly qualified medical team, offering support before, during and after the osseointegration surgery.

The process starts by the patient filling in an inquiry form and a member of the team will reply via email or phone. If the patient is found potentially suitable for osseointegration, they will be invited to attend one of the OGAAP clinics where the patient can meet other patients who have had or are waiting to have the surgery. The team will then perform clinical and radiological assessments on the patient. If the patient is found to be suitable for osseointegration, they undergo a program to prepare for the procedure. This includes physiotherapy and multiple investigations and functional tests.

The surgery is a two-stage procedure with a short interval of 6-8 weeks between 1st and 2nd stage. This is followed by early mobilization, a few days after the 2nd stage allowing rapid recovery and minimising the time spent away from family and normal day to day activity.

Post-op rehabilitation includes static loading using a stump loader on a scale, mobilizing with a trial light leg using crutches and learning to walk with the permanent prosthetic limb with crutches.

Walking with osseointegration is completely different from with a socket prosthesis as patients regain the ability to use the muscles of the limb again, resulting in a more natural gait.
Your mobility is our main priority

Dear patient - Imagine a prosthesis that wasn’t bulky, cumbersome and didn’t cause rubbing due to poor fit. Where freedom of movement and a greater quality of life is just the beginning. The future is here now!

With the Osseointegration Group of Australia Osseointegration Prosthetic Limb (OGAP-OPL) life as an amputee can dramatically change and bring your mobility as close as possible to that of an able bodied person.

To say being an amputee has a significant impact on your life is a vast understatement. For this reason your desire for improved mobility, comfort, freedom and active participation in all areas of life is our number one priority. We understand and want to ensure the goal of prosthetics is met in fulfilling these wishes and recovering the freedom and unrestricted ability to walk.

Throughout the following pages, we would like to introduce our solution to your needs: the newest innovation in the area of prosthetics, the OGAP-OPL.

INNOVATION

What is the OGAP-OPL? The OGAP-OPL is a revolutionary type of prosthesis for amputees where a conventional socket becomes unnecessary.

What makes the OGAP-OPL so innovative is it is modelled on the anatomy of the human body and takes the load back directly to the bone, the joint above and the associated muscles.

The OGAP-OPL is implanted directly into the femur, and when integrated with the bone allows for a simple, quick and safe connection between the stump and the lower prosthesis. No longer is the prosthesis merely attached to you but it becomes a part of you, resulting in greater comfort and walking control.
How does the OGAP-OPL work?

The OGAP-OPL is made up of several components which can be divided into an inner (endo) module and an external (exo) module. The endo module, a titanium stem, is directly implanted into the bone.

The implant surface is highly porous titanium which allows initial stability and long term bone integration (ingrowth). This technology has been successful in clinical use around the world for more than 30 years in joint replacement surgery. The biocompatibility of the titanium implant allows the bone to grow inside the surface of the prosthesis which makes the bone-prosthesis structure one solid unit. This is known as osseointegration.

A dual adaptor connects the internal implant to the external prosthesis. This adaptor has a highly polished smooth surface to minimise soft tissue friction. It is also coated with a titanium niobium which has antibacterial properties. This passes through a small opening in the skin known as the stoma. Externally the adaptor is fixed to a torque control safety device which further connects to the prosthetic limb. Taking on and off the prosthesis is very easy and takes less than ten seconds. Due to the solid fixture to the bone it accurately connects in the exact spot each and every time you attach the prosthesis. This device can be used with all types of prosthetic componentry.

Gone are the days of fiddling around with time consuming and cumbersome suction, socks and liners.
What are the advantages of the OGAP-OPL?

NO SOCKET
• Walking with the OGAP-OPL allows for natural loading of the hip joint and the femur which encourages bone growth and creates a more natural gait and requires less physical exertion
• Any weight or fluid variations of the stump have no effect
• No bulky socket providing a natural streamlined look in clothes

FREEDOM OF MOBILITY
• Allows for full freedom of movement from walking to cycling and recreational activities
• Muscular strength is developed freely which minimises muscle wastage of the stump
• Movement is not restricted by the protruding edges of a socket allowing for greater ease and comfort sitting, standing and walking
• The direct connection between femoral bone, implant and knee enables free, natural pivoting movements.

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EASY ATTACHMENT AND FIT
• The knee prosthesis can be easily attached and removed within just a few seconds.

OSSEOPERCEPTION
• The patient regains the ability to feel the ground and can differentiate between different surfaces such as carpet, grass, tiles and uneven ground which also allows for movement in unfamiliar areas in dim light.

Scan for patient testimonials
How does the operation take place?

The implantation of the OGAP-OPL is performed in two stages.

The first stage includes:
1) Soft tissue management where the redundant skin and soft tissue fat is removed minimizing the bone skin distance which leads to a reduced chance of complications. The muscle groups are rearranged to serve a functional purpose operating the leg and finally the soft tissue facial layer is reorganized around the stem.
2) The bone residuum is reshaped and any bone spurs will be removed.
3) The internal component of the implant is press fitted into the bone canal securing early stability and future ingrowth.
4) If there is a neuroma and nerve pain the nerves involved will be addressed surgically by excision of the painful neuroma and deep positioning of the residual nerve into the muscle group to minimise future nerve issues.
5) The stump is refashioned in a cosmetic manner and the wound is then closed in layers.

A period of 6-8 weeks interval takes place after the first stage to allow for osseointegration, this is then followed by the second stage.

The second stage includes:
A circular skin opening (the stoma) is created. Through this opening the dual cone adaptor (see picture on page 6) is connected to the internalstem which is already integrated in the bone. The remaining components of the prosthesis can then be attached externally.
Partial weight-bearing and the fitting of the lower prosthesis can take place as early as a few days after the second surgery. This is done under careful supervision of the team. It is now that rehabilitation and gait training can begin.
Factors to be considered

More than 200 satisfied osseointegration users with this type of prosthesis can testify that this technology offers significant and unparalleled advantages compared to a traditional suction prosthesis.

For many, it has allowed amputees to walk again after years of being bound to a wheelchair or crutches as a result of not being able to use a socket prosthesis. Sensible handling of the prosthesis and simple common sense can prevent any chance of future problems.

Care should be paid to the opening (stoma) through which the dual cone adaptor passes out of the stump. With normal daily hygiene the risk of infection is very low. Giving it a wash once a day in the shower is all that is needed.

Excessive rotation such as pivoting and sharp twisting should be avoided as a general rule. However, if high levels of strain should occur, the safety shear pins in the external system break to protect against a bone fracture occurring. The system yields and the bone remains undamaged. Safety is paramount, the system has been designed to protect the bone during any large strain or vigorous movements. The safety pins are easily exchanged by the prosthetist and in the near future there is the possibility they will be able to be replaced by the patient.

The implant is made of titanium, which is coated with a rough surface of a plasma spray for bone to grow into. In addition there is a layer of hydroxyapatite coating which attracts bone cells to adhere and grow into. These materials are extremely biocompatible in endoprosthetics. The body will not reject the implant and there is no permanent medication required.
FURTHER INFORMATION

Where can I find more information?

Clinics are held the first Thursday of the month in Sydney where patients are invited to meet with the surgeon and the team consisting of prosthesis, physiotherapists, rehabilitation specialists and a psychologist. Patients will also have the chance to meet and chat with other OGAP-OPL users who are at a variety of stages in the process from having had the first surgery to walking with the prosthesis for two years.

How soon after amputation can the surgery be performed?

Each situation is unique and will be assessed to make the best decision for you. It differs from person to person, one patient has gone straight from amputation to the OGAP-OPL while another was a user of the traditional suction prosthesis for 28 years prior.

FURTHER INFORMATION

Is OGAP-OPL available for below-the-knee amputees?

Yes, while the implant largely stays the same the procedure is slightly different. Patients are given a total knee replacement and the implant is inserted into the tibia rather than the femur. The implant can be inserted into the tibia without a knee replacement as well.

What is the cost?

Australian Private Health Insurance covers a significant amount of the cost involved with OGAP-OPL surgery for Australian residents. Cost will vary from policy to policy and there is a consideration for those without insurance.

What are the disadvantages?

Due to the open nature of the stoma there will be some discharge but it is not excessive and is easily managed. A little discharge means the stump is healthy.

For more information, patient testimonials or to make an appointment please visit:

www.osseointegrationaustralia.com.au

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