A PATIENT’S GUIDE: UNDERSTANDING ROBOTIC KNEE SURGERY

GARY WEXLER MD
PALM BEACH ORTHOPAEDIC INSTITUTE
Robotic Knee Replacement: A Joint Adventure

INTRODUCTION 3
ANATOMY AND COMMON KNEE DISORDERS 4
TREATMENT OPTIONS 5
WHY MAKOPLAASTY 6-8
PREPARING FOR YOUR SURGERY 9
THE WEEK BEFORE SURGERY 10
THE DAY BEFORE SURGERY 10
THE DAY OF SURGERY 10
OVERVIEW OF PROCEDURE 11
THE POSTOPERATIVE PERIOD 12-14
MONITORING FOR COMPLICATIONS 14
RETURNING TO NORMAL LIFE 15
PROSTHETIC COMPLICATIONS 15
FOLLOW—UP 15
IMPORTANT PHONE NUMBERS 16
INTRODUCTION

The purpose of this book is to help you to prepare for your knee surgery. This booklet will act as a supplement and reminder to the information given to you by your surgeon and the staff at the Palm Beach Orthopaedic Institute.

Knee replacement surgery can provide dramatic relief from those who suffer from major disorders of the knee. This procedure was developed roughly thirty-five years ago and has become one of the most predictable and satisfying procedures for both the patient and the surgeon. As many as 450,000 total knee replacements are performed annually in the United States.

Since the pioneering replacements that were done in the early 1970’s, technology has continued to evolve. Orthopedic surgeons and scientists are continually looking for ways to make the knee implants perform better and last longer. Current research involving materials and prosthetic design, advances in surgical techniques, and the biomechanics of the knee joint have diminished the risks associated with the operation.

Makoplasty is a step forward in knee replacement surgery. Surgeons are now able to partially replace diseased portions of the knee in a more natural manner utilizing state-of-the-art robotic techniques. This minimally invasive technique offers patients an easier recovery to their active lifestyles.

The Joint Replacement Program at the Palm Beach Orthopaedic Institute has a commitment to excellence in patient outcomes. The Joint Replacement team consists of your surgeon along with physician assistants, physiatrists, nurses, physical therapists, occupational therapists and discharge planners. The goal of the program is to allow for an easy transition for patients from troubling knee disorders to a pain-free, functional lifestyle without complications.
ANATOMY OF THE KNEE
The knee joint is the largest joint in the body. It is a hinge type of joint where the thigh bone (femur), shin bone (tibia), and knee cap (patella) meet.

In the normal knee, the ends of the femur and tibia and the undersurface of the patella are covered by a smooth, protective lining called articular cartilage. Healthy cartilage acts as a cushion to allow the knee joint to glide and move easily.

Ligaments, tendons and muscles are soft tissues that surround the knee joint to give stability, strength, and flexibility to the knee.

COMMON KNEE DISORDERS
In many knee disorders, the cartilage is destroyed and the smooth contact between the bone surfaces becomes disrupted. This may lead to pain, stiffness, limping and deformity.

OSTEOARTHRITIS is characterized by destruction of the cartilage and a bony overgrowth. It is a degenerative process, a “wear and tear” type of arthritis. As people age it is common to develop osteoarthritis of one or more joints.

RHEUMATOID ARTHRITIS is a chronic disorder which may involve multiple joints, and which can occur at any age. This is an inflammatory process which causes damage due to erosion of the cartilage and bone.

AVASCULAR NECROSIS results from a disruption of blood flow to the bone causing local bone death which may eventually lead to joint destruction.
TREATMENT OPTIONS

NONSURGICAL TREATMENT

Various conservative measures are used to decrease pain. These may include:

• Weight Loss
• Use of a cane or walker
• Activity modification
• Anti-inflammatory medications
• Injections
• Physical therapy

If these measures fail to reduce the symptoms, your surgeon may recommend surgical replacement of the knee joint.

INDICATIONS FOR SURGERY

• Severe knee pain
• Severe deformity/instability
• Difficulty performing activities of daily living
• Failure of conservative care

SURGICAL TREATMENT

The knee prosthesis is composed of modular parts. Metal components are cemented to the surfaces of the femur and tibia. Bone cement (methyl methacrylate) is used to bond the components to the bone. A hard plastic liner (polyethylene) is placed between these two metal components.
SURGICAL RISKS

Any surgical procedure involves risks. Our goal is to minimize those risks. What are the major risks to knee surgery?

- Infection
- Blood Loss
- Injury to the Nerves and/or Blood Vessels
- Blood Clots/Pulmonary Emboli
- Loosening of the Prosthesis
- Medical Complications

SMALL INCISIONS....BIG RESULTS
As opposed to traditional total knee replacement, MAKOplasty is a partial knee resurfacing procedure. This means that patients have smaller incisions, less blood loss, less pain and easier rehabilitation when compared to traditional knee replacement.
MAKOplasty® combines patient-specific three dimensional modeling for pre-surgical planning. During the procedure, the combination of a robotic arm and computer navigation provides the surgeon with real-time visual, tactile and auditory feedback, enabling reproducible precision and optimal positioning of the implants within the knee. It is this level of pinpoint precision and accuracy that helps facilitate optimal implant positioning and alignment to result in a more “natural” knee motion following surgery.
PREPARING FOR YOUR SURGERY

ORTHOPEDIC PLANNING
Your orthopedic surgeon will order x-rays (radiographs) of your knee to be used for surgical planning and to determine the type and size of implant to be used. Makoplasty is a technical procedure that requires a CT scan of the knee for precise bony mapping. This information allows your surgeon to make smaller incisions with precise placement of the implants.

MEDICAL CLEARANCE
• You will need to be examined by a medical doctor prior to your surgery.
• The medical doctor will take your medical history, examine you, and order all presurgical tests such as chest x-rays, electrocardiograms and laboratory tests.
• All presurgical tests such as chest x-rays, electrocardiograms and laboratory tests must be completed prior to the day of surgery.

IMPORTANT! IMPORTANT!
Inform the Medical Doctor of the following:
• Current medications
• Prior surgeries
• Previous history of blood clots or infections
• Past surgical complications
• Allergies to medications, tape, latex, and iodine
• Past Illnesses

BLOOD DONATION
Since MAKOplasty® utilizes smaller incision, pre-operative blood donation is not required.

MISCELLANEOUS PREPARATION
• Notify your surgeon if you have developed any infections, including cold or flu, urinary infections, skin rashes or sores. Any of these problems could lead to the postponement of surgery.
• Schedule an appointment with your dentist prior to surgery if you are having any dental problems.
THE WEEK BEFORE SURGERY

Stop taking aspirin or other nonsteroidal anti-inflammatory drugs (NSAIDS) seven days before your surgery. You may take acetaminophen (Tylenol) for discomfort. If you need stronger pain medication, please contact the office.

Clarify with your medical doctor what medications you are to take on the morning of your surgery.

Plan for eventual discharge and return home by:
• Arranging for meal preparation by stocking up on frozen and prepared foods which can be stored in the refrigerator or freezer.
• Organizing your bedroom and bathroom with safety features. Clear pathways and eliminate throw rugs.
• Bring crutches or walker (if you have them) to the hospital. If you don’t have these, they will be provided.

PACK A SMALL SUITCASE
• Personal hygiene items
• Comfortable shorts or jogging pants
• Non-skid slippers or shoes
• Small amounts of cash for T.V., newspapers, etc.
• Cosmetic items

LEAVE YOUR VALUABLES AT HOME!

THE DAY BEFORE SURGERY

The hospital staff will notify you of your surgery time and scheduled admission time. If you do not receive a call the day before surgery, please contact the hospital admissions office. You may not eat or drink anything after midnight on the night before your surgery. Prior to coming to the hospital, take a shower and wash the knee and leg thoroughly with soap and water. Go to bed early and get a good night’s rest.

THE DAY OF SURGERY

ADMISSIONS UNIT/ PREOPERATIVE HOLDING AREA

Report to the admitting office promptly; this will be approximately two hours prior to your surgery time. Bring your insurance identification card and picture I.D. such a driver’s license.

Preparation for your surgery will continue in the admission unit. This includes checking your vital signs, applying hospital identification and allergy bracelets and changing into a hospital gown and robe. Your belongings will be locked for safe keeping and transferred to your room.

Your family and friends will be directed to the surgical waiting area after you are discharged from the admissions unit. Your surgeon will contact your family and friends at the completion of
surgery. Final preparations are made in this area. Anesthesia will evaluate you at this time. An I.V. will be started to give you medication, antibiotics and fluids.

Surgery takes roughly 2 hours to complete.

ANESTHESIA

There are two types of anesthesia which may be used for your surgery. You may receive one or a combination of both.

Regional Anesthesia: The most commonly used regional anesthetic is a spinal. This involves the placement of a small tube in the lower part of your back. Medication is injected into this tube which will “numb” your body from the waist down. Following surgery, your anesthesiologist may supplement with a femoral neck block.

General Anesthesia: This will be administered through your I.V. tube after you are brought into the operating room. This medication will keep you asleep during the entire surgery.

OPERATING ROOM

You will be wheeled into the operating room and assisted on to the operating room table. The surgeon and assistants will be wearing protective suits and helmets which protect against infection.

The operation usually lasts from 1 to 3 hours.

You will be laying on your back during the procedure with special cushions to support your head, body and limbs. Your anesthesiologist will monitor your vital signs and administer medications as necessary.

OVERVIEW OF SURGICAL PROCEDURE

1. A tourniquet (inflatable cuff) is applied to the upper leg to reduce bleeding during surgery.
2. An incision is made on the front of the knee.
3. The diseased ends of the femur and tibia are removed utilizing the robotic arm.
4. The prosthesis is fit to your bone and secured in place.
5. The skin incision is closed.
6. A plastic drain tube may be placed inside the wound to allow for drainage of blood.
7. The incision is covered with a sterile dressing. A cooling device is attached to your leg.

At this point, the anesthesiologist will stop the anesthesia and you will gradually wake up and become aware of your surroundings.
RECOVERY ROOM
In the Recovery Room, you will be monitored as you awaken from anesthesia. The nurses and surgical team will monitor your vital signs, vascular (blood flow), and neurological (nerve function) status of your legs. You will be kept warm with heated blankets. Your bed will have an overhead trapeze to help you with your mobility. Once you are awake and your vital signs are stable (approximately one to three hours after surgery) you will be transferred in your bed to a hospital room.

ORTHOPEDIC CARE UNIT
PAIN CONTROL
Your postoperative pain will be controlled with one or more of these methods.

PCA (Patient Controlled Anesthesia)
This is a pump connected to your I.V. which delivers pain medicine such as Morphine or Demerol with the push of a button. You control how often you receive your pain medication within safety limits.

Oral
Once your PCA has been stopped, you will be able to take your pain medication by mouth.
• You can take your pain medication every 4 hours.
• Make sure you ask for your pain medication 30 minutes prior to physical therapy.
• If you are not receiving adequate pain relief, contact your nurse.

Diet
After your surgery you are started on clear liquids. You will be advanced to a solid diet as tolerated. It is important to drink fluids to prevent urinary tract infections, fevers and constipation.

Activity
• You will be started on an accelerated rehabilitation schedule.
• A pillow may be placed under your ankle and calf to promote knee extension.
• When you are medically stable you will begin physical therapy.
• Physical therapy usually begins the first day after surgery.
• You will attend physical therapy 1-2 times/day throughout your hospital stay.

Circulation
After surgery it is important to keep the blood flowing within your leg to decrease leg swelling and to prevent blood clots.
To aid in circulation and prevent blood clots:
• Special elastic stockings (TED Hose) may be worn on your legs
• Inflatable devices around you leg and/or foot may also be used while lying in bed.
• Anticoagulation medication such as Aspirin will be given.
• Eat high fiber foods (i.e. whole grain, fruits, vegetables)
• Drink fluids

Respiratory
Deep breathing and coughing exercises will be started immediately after surgery to help prevent lung congestion.
You will be instructed on the use of a breathing exerciser. This will be at your bedside and should be used at least every hour while you are awake to help keep your lungs clear.

SURGICAL COMPLICATIONS

Medical
Anesthesia and the surgical procedure carries cardiac and respiratory risks which may result in a life threatening situation.

Infection
You will be closely monitored for wound, respiratory and urinary infections during your hospitalization. Infection can occur following anesthesia and the placement of urinary catheters. Treatment of any infection will help prevent prosthetic infection which can be catastrophic.

Blood Clots
Blood clots can develop in the leg after knee replacement surgery which can be life threatening if they move to the heart or lungs. Methods used to prevent clot formation include: early mobilization, elastic stockings, compression devices, and anticoagulation medications.

Nerve or Blood Vessel Injuries
The injuries can occur due to the proximity of the nerves and blood vessels to the surgical site. Nerve injuries may result in numbness and/or loss of motion to the leg. This may require future treatment such as physical therapy, bracing or surgery.

POST HOSPITAL CARE

Planning
Planning for discharge from the hospital begins early. The Joint Replacement team will determine if you are ready for discharge to your home, or if you would benefit from an extended stay in the rehabilitation center. Most Makoplasty patients go home.

When you leave the hospital and return home, the Discharge Planner will assist you in arranging any home services that will be needed. Home services may include: visiting nurses, physical therapists, and health aides. The home nurse and therapist will communicate your progress directly with your surgeon. CPM knee motion machines will be utilized and you will be enrolled in outpatient physical therapy.

Caring for the Incision
Upon discharge from the hospital, a dry dressing will cover the incision. You should change the dressing as instructed. The wound should remain dry. The stitches or staples will be removed one to two weeks following surgery. Call your surgeon immediately if your incision swells, drains,
becomes reddened, painful or if your temperature is above 101.5 degrees.

**Reminder**
Call your surgeon if:
- Drainage from the knee or redness
- Temperature over 101.5
- Increased pain
- Increased swelling
- Decreased range of motion

**MONITORING FOR COMPLICATIONS**
Problems such as deep vein thrombosis (blood clot in the leg) or pulmonary embolism (blood clot in the lung) can occur after surgery.

**Deep Vein Thrombosis**
Call your surgeon immediately if any of these signs develop:
- Swelling in leg that does not go away with elevation
- Pain in calf or behind the knee
- Calf warmth or redness

**Pulmonary Embolism**
Go to the emergency room immediately if you experience any of the following:
- Shortness of breath
- Chest pain
- Coughing up blood or pink mucus

**Infection**
Dental procedures (including cleaning), certain invasive procedures such as colonoscopy or cystoscopy and certain surgical and gynecological procedures can result in bacteria entering your blood stream. The physician or dentist may give you antibiotics prior to and after the procedure to help prevent against infections of your joint replacement. Inform your dental office and physician that you have a knee replacement.

**RETURNING TO NORMAL LIFE**
By six weeks postoperatively your surgeon expects you to return to strenuous activity such as swimming and biking. Leg swelling may worsen with increased activity. Leg pump exercises, leg elevation, and wearing support stockings can help prevent this.

**Returning to Work**
If you have a sedentary job, your surgeon may allow you to return to work as soon as one week after surgery. Your return to work may be delayed longer if your job requires prolonged standing, walking or lifting.

**Driving**
You need to bear weight through your operative leg prior to resuming driving. Your muscles must be strong enough to respond quickly while driving.

**Sexual Activity**
Resume sexual activity when comfortable for both partners.

**Recreational Activity**
A number of activities are acceptable for knee replacement patients. Moderation is an essential
requirement to avoid exposing the new prosthesis to undesirable stresses. Acceptable activities include:
- Swimming
- Biking
- Walking
- Dancing
- Golfing (Cart)
- Bowling
- Tennis (Doubles)

The goals of recreational activity are to perform exercises without exposing the knee to high impact activities or heavy lifting. Ask your surgeon regarding any other recreational activities or types of exercise equipment that you would be interested in.

PROSTHETIC COMPLICATIONS

**Infection**
Infection can occur any time after joint replacement surgery. In our medical center with the use of modern, state-of-the-art operating rooms, the incidence of acute infection is extremely low. Infection, however, can occur secondary to an infection elsewhere in the body. Superficial infections of the incisional area are often treated by a short course of antibiotics. A deep infection is more difficult to treat and therefore may result in prosthetic loosening. Deep infections may require surgery, long term antibiotics and possible removal of the prosthesis.

**Loosening**
Over time the components may loosen from the bone. A loose prosthesis may or may not be associated with pain and/or bone loss. If the pain becomes disabling or the bone loss is extensive, the knee replacement may need to be revised. Polyethylene may wear over time which may produce tiny particles of plastic that can cause reactions in the bone. Bone loss which occurs as a reaction to these particles is called osteolysis.

**FOLLOW-UP**
Routine follow-up visits are scheduled at regular intervals during the first year following your surgery. After the first year, an annual exam and x-rays are recommended to evaluate your function and the status of your prosthesis.
IMPORTANT PHONE NUMBERS

PALM BEACH ORTHOPAEDIC INSTITUTE

Main Office (561) 694-7776
3401 PGA Blvd., Suite 500, Palm Beach Gardens, FL 33410
1411 N. Flagler Drive, Suite 9800, West Palm Beach, FL 33401

Medical Assistants

Donna (561) 727-1114 or bones@pboi.com, FAX (561)727-1214
Tara (561) 727-1117 or tarac@pboi.com

Secretary

Elizabeth (561) 727-1116 or elizabehtha@pboi.com

Good Samaritan Medical Center
1309 N. Flagler Drive, West Palm Beach, FL 33401

Main Operator (561) 655-5511

Admissions (561) 650-6255

CT (561) 650-6176

The admissions office is located on the first floor of the hospital by the main entrance. The orthopedic surgical unit is on the 2nd floor.

PBOI.com