



Anterior Approach to Total Hip Arthroplasty

JILL WEHLING, CST

The first hip replacement using the anterior approach was performed by Dr Robert Judet in 1947 at Hospital Raymond Poincare in Garches, France, outside Paris. The surgery was performed on a special table, the Judet Table, with the patient lying in the supine position.

The special table helped position the patient's legs and hips during surgery. The reasons for Judet's choice of this approach for surgery were:

- The hip is an anterior joint, closer to the skin anterior than posterior.
- The approach follows the space between the muscles, causing less trauma.
- The approach exposes the hip without detachment of muscle from the bone.

In 1996, Dr Joel M Matta from Hip and Pelvis Institute at Saint John's Health Center in Santa Monica, California, brought the anterior approach to the United States from Europe. He first saw this Total Hip Arthroplasty technique in 1981 when he visited Dr Emile Letournel in Paris to study acetabular and pelvic fracture surgery. Dr Emile Letournel had been Robert Judet's resident. Dr Matta had learned the anterior approach from Letournel and was intrigued by it, but never

LEARNING OBJECTIVES

- ▲ Learn about the history of hip replacement
- ▲ Compare the differences of the traditional and anterior approaches to hip replacement
- ▲ Identify the equipment specifically needed for these cases
- ▲ Discover which candidates are the best fit for the anterior approach
- ▲ Examine the surgical technique for this procedure

actually used the technique until 1996. A patient, who now lives in the US and had one hip replaced in France, tracked down Dr Matta and asked him to replace his other hip using the same procedure. The patient was very enthusiastic about the rapid recovery and lack of muscle disturbance, which led Matta to reconsider the value of this technique and its potential benefits of reduced dislocation risk and recovery rate. Today, Dr Matta has been instrumental in the training of this technique to many orthopaedic surgeons as well as designing a surgical table called the hana® table in 2005.

Although total hip arthroplasty remains one of the most successful surgeries done by orthopedic surgeons, complications that may occur include dislocation, leg-length discrepancy and abductor dysfunction. The anterior approach for total hip replacement is an incision done through a single, tissue sparing approach that allows implantation of the

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The standard posterolateral approach requires division of the posterior hip capsule and the external rotators and is associated with a higher dislocation rate. Typically, posterolateral requires strict precautions for the patient. Most patients must limit hip motion for six to 12 weeks after surgery. They must limit flexing of the hip to no more than 90 degrees and avoid internal rotation, which can complicate normal activities such as sitting in a chair or on a toilet seat or getting into a car. Anterior hip replacement allows patients to immediately bend their hip freely and bear full weight when comfortable, resulting in a quicker return to normal function. Patients will endure supervised physical therapy where they will be required to go up and down stairs before their hospital release.

MATERIALS AND METHODS

The following equipment is key in facilitating a smooth transition to the anterior approach:

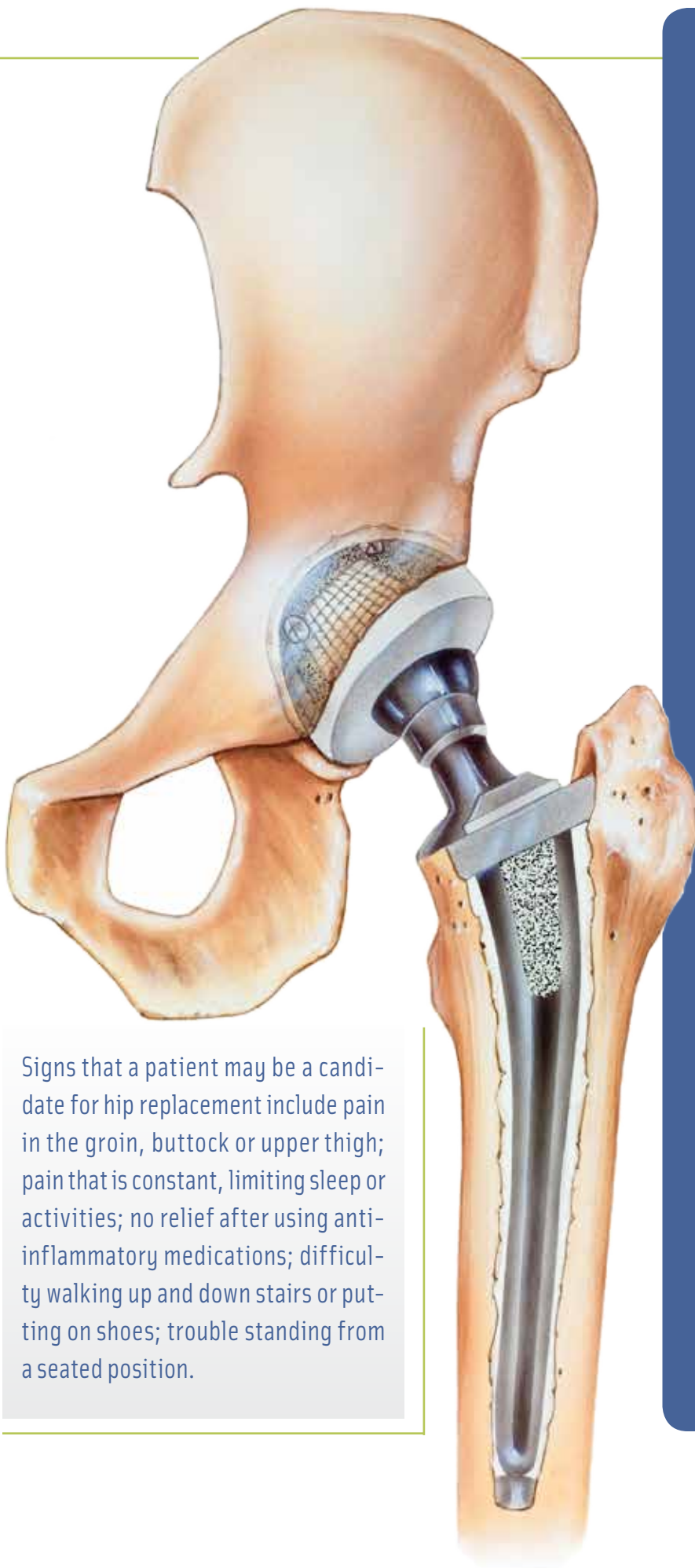
- Hana® table and its associated parts (Boots, foot pedal to control femoral lift, perineal post, webril and coban to wrap the foot/boot)
- A 12" vascular C-Arm. The larger C-Arm allows simultaneous viewing of both hips to ensure proper positioning of components and restoring leg lengths.
- X-ray gowns for all staff
- Previous X-ray films posted
- Templates

CANDIDATES

People who suffer from arthritis, hip pain, stiffness and limited hip movement are good candidates for this type of approach to hip replacement. The most common criterion is BMI (body mass index) of less than 35. Patients with excessive abdominal pannus and short, muscular thighs are the most technically demanding.

SURGICAL TECHNIQUE

After general or regional anesthesia, a perineal post will be placed and the boots will be attached to the table. The non-operative hip will be in neutral position and slight abduction to serve as a reference for the operative side under C-arm. Both arms will be extended and securely positioned. Draping consists of an up and down sheet, upper split sheet and an isolation drape. The incision will start at 2 cm posterior and 2 cm distal to the anterior superior iliac spine. The fascia lata will be incised over the tensor in line with the skin incision. Blunt dissection will separate the fascia off the medial portion of the tensor. Two Allis clamps will be placed on the fascia as retractors. The blunt dissection will be taken down to the level of the anterior hip capsule. The lateral circumflex vessels then will be coagulated. A cobra retractor will be placed lateral to hip capsule to retract the tensor and gluteus medius and minimus laterally. Allis clamps will be removed and a second cobra will be placed under the rectus muscle. The anterior capsule then will be opened and traction will be placed on the operative leg by the circulating nurse. The surgeon will need to check his or her neck cut placement under the C-arm. A skid will be cir-



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WHO IS A CANDIDATE FOR ANTERIOR HIP REPLACEMENT?

Generally an orthopedic surgeon will see evidence of damage to the articular cartilage on his or her patient's X-ray. Signs that a patient may be a candidate for hip replacement include pain in the groin, buttock or upper thigh; pain that is constant, limiting sleep or activities; no relief after using anti-inflammatory medications; difficulty walking up and down stairs or putting on shoes; trouble standing from a seated position.

If it is determined that a patient is a candidate for hip replacement, his or her surgeon will address the following questions to see if the patient qualifies for the anterior approach.

- **Is there arthritis in the hip?**
 - The patient would be a good candidate for the anterior approach if the patient only has arthritis in the hip and none of the other following exclusions.
- **Is there history of previous hip replacement or other major surgery on the hip?**
 - If the patient has a history of previous hip surgery, the traditional approach would most likely be performed to allow for the full exposure of the hip during surgery.
- **Does the patient have severe hip dysplasia?**
 - Certain cases of severe hip dysplasia require a femoral osteotomy to allow the hip to be placed back into pocket. Another approach to hip replacement would be advised.
- **Does the patient have heterotopic bone in the hip?**
 - An excess of bone can make it difficult to perform a minimally invasive procedure around the hip joint so another approach would be advised.
- **For a male patient: Is the patient very muscular?**
 - Muscular male patients are the most challenging patients to perform this procedure on because of their muscle mass and the complications that can arise.
- **Is the patient obese with a BMI of 35 and over?**
 - Patients who are considered morbidly obese are at an increased risk for developing wound infection because the pannus can keep the incision from staying dry.

REFERENCES

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cumferentially placed around the head to free the ligamentum and then the neck will be cut. A straight osteotome will help to loosen the head and a corkscrew will aid in removing the head. The head then will be measured to estimate the final cup size.

With light traction and 45 degrees of external rotation, the acetabulum will be seen. A bent Hohmann retractor will be placed over the distal anterior rim of the acetabulum to retract the anterior muscles. The labrum will need to be excised circumferentially. Any fat will need to be removed from the acetabular fossa. Once the osteophytes are removed with an osteotome and rongeur, the acetabulum will be sequentially reamed. The final cup will be impacted with the use of fluoroscopy to verify the appropriate positioning. A screw may be placed depending on surgeon preference.

Femoral exposure will need to be gained by the femoral hook, which will be placed behind the proximal femur that is attached to a bracket on the Hana table. The femur will be rotated 90 degrees and the leg spar will be placed on the floor to hyperextend and adduct the hip. The femoral hook then will be slowly elevated to the desired tension monitored by the surgeon. After the release of the lateral capsule, the tip of the trochanteric retractor is used to retract the gluteus minimus muscle and the piriformis. A “cookie cutter” will be entered at the neck near the posterior medial cortex. The tip of the first broach then will be inserted with an offset broach handle, which will allow ease of the femoral insertion. The femoral trial components are initially chosen according to the preoperative templates. When broaching is completed, a trial reduction with the neck length will be placed. The femoral hook will be lowered

ADVANTAGES OF ANTERIOR APPROACH TO HIP REPLACEMENT

	Anterior	Traditional
Average Hospital Stay	2 to 4 days	3 to 10 days
Smaller Incision	3 to 5 inches	8 to 12 inches
Less Muscle Trauma	No muscle detachment	Muscles cut from the bone
Recovery Time	2 to 6 weeks	10 to 12 weeks

Other benefits of the anterior approach include:

- Reduced pain
- Reduced blood loss
- Reduced tissue impact
- Reduced risk of dislocation
- More accurate leg length control
- Quicker return to normal activities

and removed, the hip will be flexed to the neutral position, the traction will be applied and the hip will be reduced with internal rotation. The traction will then be released. Fluoroscopy then will be brought in to verify leg length. Once the decision is made on femoral components, a bone hook, external rotation and traction will be used to dislocate. Femoral exposure will once again be obtained (femoral hook, femur rotated 90 degrees and hip is hyper extended and adducted.) Trial broach then will be removed and the femoral prosthesis will be inserted and the permanent head will be placed. The hip again will be reduced and a final fluoroscopy will be taken. The wound will be irrigated and checked for any additional bleeding. A #2 Quill will be used to close the fascia lata in a running suture. A 2-0 Vicryl CT-1 will be used to close the subcutaneous layer. Staples will be used on skin, with the exception of higher BMI patients, and a 3-0 Ethilon PS-2 suture may be used to close the proximal end of the incision. A sterile petrolatum gauze with 4x4's, an abdominal dressing and two large wound dressings will cover the incision. A large elastic bandage with an adhesive compression will be wrapped around the patient's pelvis.

RECOVERY

The patient's hemodynamic and neuromuscular statuses will be monitored closely during the hospital stay. Usually, there are no specific precautions given regarding limited activity as doctors want the patients up and moving, bearing full weight on the hip on the day of surgery. Typically, patients will be discharged after two or three days in the hospital.

CONCLUSION

Hip replacement is an excellent option for patients with severe hip degenerative joint disease. A positive outcome can be achieved, regardless of approach; however, finding ways to ease the recovery process, limiting complications and decreasing the hospital stay can be achieved through the anterior approach.

Training and experience are crucial to successfully performing this minimally invasive surgical technique, so there may be a learning curve for the surgeon and the team.



AUTHOR'S BIO

Jill Wehling, CST, lives in Verona, Wisconsin, and graduated from Mt Hood Community College Surgical Technology Program in Portland, Oregon, in 2003. She works



TO WATCH EDUCATIONAL VIDEOS FEATURING HIP REPLACEMENT WITH THE FOCUS ON THE ANTERIOR APPROACH, VISIT

<http://www.anteriorhip.net/educational-videos.html>
<http://anteriorhip.org/anterior-hip-replacement.html>

at Meriter Hospital in Madison, Wisconsin, where she is the lead orthopedic surgical technologist.

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