Michael B. Millis on Periacetabular Osteotomy

The Bernese acetabular osteotomy was pioneered by Reinhold Ganz, MD, of Bern, Switzerland, and is sometimes called the Ganz osteotomy. Michael B. Millis, MD, one of the most experienced surgeons in the United States with this technique, provides an update for Orthopedics.

How can periacetabular osteotomies help patients?

The most common single cause of osteoarthritis of the hip in North America is hip dysplasia, and it usually is not diagnosed until early adulthood. This is a commonly needed procedure, but unfortunately, many patients who are referred to me are too old for it. This kind of surgery is highly effective if patients are diagnosed in time and referred to appropriate specialists. Our experience in Boston with the Bernese periacetabular osteotomy is approximately 700 hips, and only 22 of those hips so far have gone on to total hip replacement (THR) during our 15 years of experience.

Why use the Bernese periacetabular osteotomy instead of other techniques?

Alternatives to the Bernese periacetabular osteotomy are the triple innominate osteotomy and the spherical or rotational acetabular osteotomies. The triple osteotomy does not allow as extensive corrections and, as it is usually done, it does not allow surgical approaches that preserve the abductor muscles. Similarly, the rotational or spherical osteotomies involve extensive dissections, usually on the opposite side of the pelvis, sometimes with trochanteric osteotomies.

Therefore, we use the Bernese osteotomy because it allows extensive corrections to be done without disturbing the abductor muscles. It also allows medialization as well as rotation in three planes, so it is a versatile operation that can be done through several different surgical approaches. Its particular advantages lie in the ability to do it without disturbing the abductor muscles. The abductor muscles are perhaps the most important muscles for the hip and most other pelvic osteotomies involve disturbing the abductor to some degree, which can lead to a temporary or even permanent limp postoperatively.

The Bernese procedure also allows one to simultaneously do an arthrotomy and deal with intra-articular problems such as labral tears. The spherical osteotomies in particular have not traditionally been done along with arthrotomy because of concern...we use the Bernese osteotomy because it allows extensive corrections to be done without disturbing the abductor muscles.

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for the blood supply of the acetabular fragment. The ability to perform the Bernese osteotomy along with arthrotomy without disturbing the blood supply to the acetabulum is a distinct advantage.

In general, it is a good operation for young active people. It allows them to get back to doing all of their activities almost without restriction, which usually does not occur with a routine THR. There are advantages to joint preservation, and this is one of the more useful joint-preserving techniques.

**What are the inclusion and exclusion criteria when selecting patients for this procedure?**

The inclusion criteria are a mature patient with congruous acetabular dysplasia severe enough either to cause symptoms of, or the future risk of, osteoarthritis. The exclusion criteria include patients whose dysplasia is so mild that they do not need the procedure or someone in whom the osteoarthritis is so far along that the procedure will not help them. Immature patients who have open growth centers in which other procedures might have to be done should be excluded as well.

**What about patients with painless dysplasia, including the contralateral hip with dysplasia, who have no symptoms?**

In general, absolute absence of symptoms is a contraindication for the procedure in that its best indication is for congruous symptomatic acetabular dysplasia.

**What are the potential complications of the procedure?**

The potential complications include all of those associated with any major hip surgery. These include damage to adjacent nerves, including the femoral or sciatic nerve, as well as the obturator nerve and lateral femoral cutaneous nerve; damage to major blood vessels; osteonecrosis of the acetabular fragment or femoral head; intra-articular fracture; and thromboembolic phenomena, mainly clots in the legs following the procedure. The progression of osteoarthritis may also occur if the procedure is done in a patient with osteoarthritis that is too advanced.

**What is the potential for leg-length disparity following the procedure?**

Just as with THR, if one does not pay attention to how the osteotomy is made and how the fragment is rotated, the potential exists for either lengthening the ipsilateral limb or shortening it, or for translocating the fragment anteriorly, which would make patients seem as if they had a long leg when they sit.

**Describe the recuperation and rehabilitation following the procedure.**

Typically, patients are on two crutches for 6-12 weeks. Younger patients, patients with less severe arthritis, and patients with less extensive correction are often off their crutches in 6-8 weeks. The physical therapy program is not aggressive. Mostly it is a gentle range of motion with strengthening exercises and the time on crutches.

**Do patients who undergo the procedure develop pathologic pain postoperatively?**

Usually not. Most patients experience some temporary mild dysesthesia in the distribution of the lateral femoral cutaneous nerve, which I tell all patients to expect. This is common with any anterior approach to the hip, which is the approach usually used for this procedure. Any bothersome symptoms in this nerve distribution tend to be temporary and minor. It is rare for patients to develop more pathologic pain or any significant problems with nerve-based weakness, although it can occur in approximately 1% of patients.

**Is there a role for computer navigation in the technique?**

Computer navigation is not routinely used. We have used it here in Boston and Professor Ganz in Bern has also used it, mostly as a research tool. As approaches become much more minimally invasive, we probably will be using more computer navigation.