Introduction

Total hip arthroplasty is perhaps the most successful operation of the 20th century – this must be foremost in the mind of the surgeon who is considering the various alternative techniques to “traditional” hip-replacement approaches. The orthopedic surgery community of the 21st century must be careful not to change too radically or too quickly an operation with such a proven track record.

To be considered minimally invasive, any total hip-arthroplasty approach must lessen the impact of surgery on the patient's quality of life and disruption of daily routine. Serious complications, such as nerve injury, leg-length discrepancy, dislocation and fracture must be minimized. The surgeon must pay attention to reducing surgical time in order to minimize blood loss, contamination leading to infection, and phlebitis. Minimally invasive does not mean just a small incision but refers more importantly to what goes on beneath the skin. The emphasis is on gentle exposure that minimizes overall muscle trauma. Although some exposures do not require removal of any muscle insertions, these indirect exposures can severely bludgeon the muscle and have the potential to create maximal trauma (invasion).

Mini-incision surgery requires careful patient selection and education. Patients must have realistic expectations consistent with their body habitus. It is essential that the surgeon discuss the benefits of small incision surgery balanced with the ultimate goal of accurate component positioning, minimal risk of complication and maximal potential for durable result.

Surgical Technique

Rationale

The antero-lateral mini-incision approach is a modification of the standard approach developed and used at Rothman Institute Orthopaedics over the past 20 years. The incision length is shortened, and therefore modified techniques and specialized equipment are required to maximize direct visualization without the need for fluoroscopy. Direct visualization of the bony anatomy of the hip is critical to a successful technical result.

The patient is positioned in the supine position. This allows simple and very accurate leg-length measurement, without the use of calipers or pins, by simply palpating the malleoli. Acetabular orientation is simplified without concern over intra-operative pelvic shift. The surgeon can directly palpate the anatomic landmarks of the pelvis (anterior superior iliac spines, pubic symphysis) and have an easier appreciation of the three-dimensional anatomy of the acetabulum. It is well documented that the antero-lateral approach has a lower dislocation rate than the other approaches (Maisonis, Bourne). The posterior capsule is retained to minimize post-operative restrictions and speed early recovery.

Instrumentation and Prosthetic Choice

Three special acetabular retractors have been designed to facilitate exposure (Fig. 7.21). One retractor is fitted with a fiberoptic light to improve visualization of the acetabulum (Fig. 7.22). Special acetabular compo-
Fig. 7.21. Acetabular retractor

Fig. 7.22. a Acetabular visualization without fiberoptic lighting. b Acetabular visualization with fiberoptic lighting

Fig. 7.23. Low profile Trident® (Stryker Howmedica Osteonics, Allendale, NJ) acetabular component impactors

Fig. 7.24. Low profile broach handle

Fig. 7.25. Low profile Trident® acetabular component impactors ease insertion of the final component (Fig. 7.23). The special femoral retractors consist of two double-footed retractors. The broach handles have been modified for ease of insertion through a smaller incision (Fig. 7.24). The trial instruments have snap-on heads with a special insertion device to aid in head-neck trials. Low-profile component insertion handles and head impactors have been designed. This special instrumentation has been consolidated into a single-equipment tray (Fig. 7.25) available from Stryker Orthopedics (Mahwah, NJ). Finally, component selection is important. A system must be selected which facilitates component positioning through a small incision. This particu-