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Letter to the Editor

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Tissue-sparing surgery in total hip arthroplasty: sensible approaches and tested evidence

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Abstract Minimally invasive total hip arthroplasty was advocated as a surgical procedure resulting in a faster functional recovery when compared with standard-length incision approaches. Currently, the potential benefits of low-surgical dissection are still unproven in well-designed clinical trials. Undoubtedly, smaller incisions and less soft tissue injury than in conventional arthroplasty should be promoted, according to the concept of tissue-sparing surgery. The advantages associated with less invasive surgical procedures must be evaluated carefully against the technical concerns that have the potential to adversely affect primary total hip arthroplasty outcome.

Key words Minimally invasive surgery • Tissue-sparing surgery • Total hip arthroplasty

The use of minimally invasive techniques, involving less trauma to skin, soft tissues and bone, is well documented in orthopaedic surgery. Total hip arthroplasty (THA), first performed more than forty years ago, can be considered a safe and effective procedure in the treatment of severe joint diseases [1]. Conventional techniques, including several surgical approaches involving large incisions, provide favourable and predictable results [2, 3]. In recent years, a substantial advance in THA consisted in the ability to perform this operation using less invasive approaches. When compared with standard techniques, less invasive surgery offers several potential advantages, such as a shortened operative time with lower blood loss and postoperative pain, a reduced hospital stay followed by a quicker functional recovery. Some patients also appreciate a better cosmetic result.

Although all patients undergoing THA can benefit by a smaller surgical dissection, there is technical difficulty related both to patient factors (severe obesity and muscle hypertrophy) and to anatomic factors (severe hip dysplasia and complex revision procedures).

An increased interest in minimally invasive surgery (MIS) in THA was provided by Berger and Duwelius [4], who developed a two-incision procedure. Using this particular double-approach technique, promising results were reported regarding the ability of the patients to recover faster because of reduced pain and muscle damage [4]. Following Berger's experience, many surgeons performed MIS-THA with use of two incisions, but most authors obtained an unsatisfactory outcome, especially regarding a significantly higher complication rate [5–7].

Moreover, as previously observed in traumatology concerning placement of the gamma nail, which results in an average 27% damage to the gluteus medius tendon [8], Mardones et al. [9] documented in a cadaver study a significantly increased rate of injury to the gluteus medius and gluteus minimus muscles compared with "open" implantation of the femoral stem. Therefore, THA per-

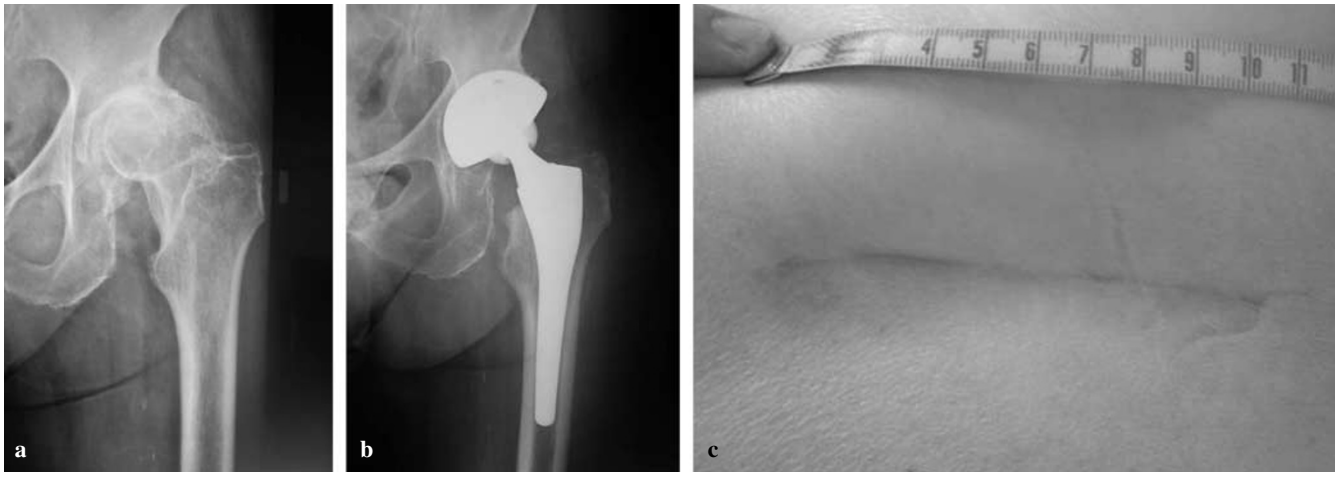

Fig. 1a-c *74 year-old female patient affected by primary osteoarthritis of the left hip*. **a** Pre-operative X-ray. **b** Uncemented total hip arthroplasty performed through a minimally invasive approach. **c** Scar appearance at follow-up

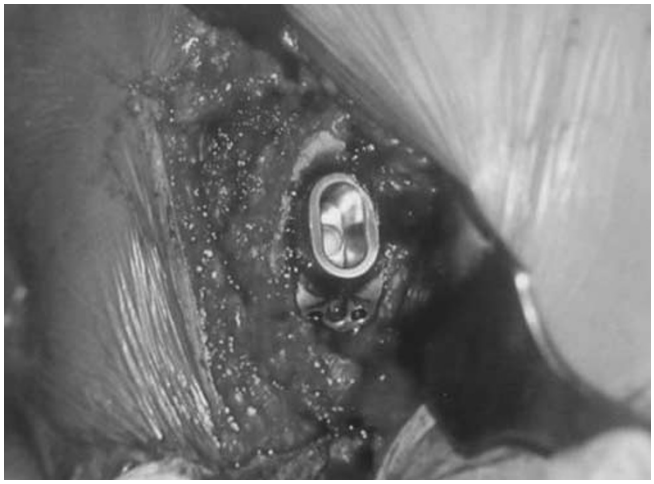

Fig. 2 Intraoperative view showing the placement of an uncemented femoral stem provided with an interchangeable neck

formed through a double incision is a technically demanding procedure and it is currently considered as a surgical approach under investigation because of the inability to provide reproducible results. Single-incision MIS-THA may be performed through anterior, anterolateral, or posterior approaches (Figs. 1, 2). Regardless of the surgical exposure, the published studies showed no significant benefits in pain, function, blood loss, length of hospital stay or thigh swelling, with equivalent complications. Some evidence of higher complication and malposition rates when compared to standard techniques has been reported [10].

Therefore, we believe that the aim of minimizing surgical invasiveness and hastening functional recovery should be gained with tissue-sparing surgery (TSS) better than with MIS. TSS is not a particular technique but a "surgical philosophy", consisting in a maximum respect for soft tissues and bone, including reduction of operative invasiveness and use of minimally invasive surgical solutions [11]. The availability of a femoral stem provided with an increased modularity, extended to the neck, turned out to be very useful to respond to the special requests of less invasive surgery (Fig. 2). The term "mini-approach" should be preferably used because the concern about deep dissection prevails over the concern about the length of skin incision [12].

In conclusion, the position of the prosthetic components, combined with effective biologic fixations and low-wear bearing surfaces, proved to be a key factor in achieving a successful and durable THA. Less surgical trauma is desirable, but minimally invasive solutions must not increase the rate of complications and component malpositioning. Orthopaedic surgeons should adopt the smallest incision that allows an adequate surgical exposure in order to perform the procedure at best. It must be emphasized that there is no use in measuring the length of the skin incision because it is clinically and functionally irrelevant.

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