

A surgical draping technique for hip arthroplasty

V Askins¹, CJ Lavernia² and DS Hungerford³

¹Department of Orthopaedics and Rehabilitation, University of Miami School of Medicine/Jackson Memorial Medical Center, Miami, Florida; ²Division of Arthritic Surgery, Department of Orthopaedics and Rehabilitation, University of Miami School of Medicine, Miami, Florida; ³Division of Arthritic Surgery, Department of Orthopaedic Surgery, The Johns Hopkins University School of Medicine/Good Samaritan Hospital, Baltimore, Maryland, USA

Abstract

Particular attention to surgical draping techniques is essential to decrease the possibility of violation and contamination of the operative field and reduce the risk of wound infection. The use of impervious layers, non-woven disposable materials, and iodophor adhesives are advances directed at reducing operative risk of wound contamination. A paucity of information exists in the orthopaedic literature describing surgical draping techniques for hip arthroplasty. We describe a surgical draping technique designed to provide a multi-layer impervious barrier between the patient and the operative field for use in hip arthroplasty.

Keywords: hip arthroplasty; surgical drapes; draping techniques

Introduction

Infection following total hip arthroplasty has devastating implications for the patient. The need for additional operative procedures, prolonged disability, the possibility of amputation, and even death can result from an infected arthroplasty. In addition, the cost of surgical and medical intervention to successfully eradicate an infected arthroplasty are enormous. It is generally accepted that the majority of infections are due to hematogenous, lymphatic seeding, or direct contamination during the operative procedure. In the operating room, the patient and the operative personnel are the major sources of wound contamination.¹⁻⁴ As hip arthroplasty has evolved, there has been increased emphasis placed on the prevention of sepsis and improvements in aseptic surgical techniques. Laminar flow air systems, body exhaust suits, and perioperative antibiotics are milestones that have been implemented by orthopedic surgical teams to improve aseptic surgical technique and have resulted in drastic reductions in the incidence of infection following hip arthroplasty.^{1,2,5-14}

Surgical draping techniques, although an apparent minor component in infection prevention prophylaxis, are an essential aspect of its prevention. Major advances in surgical draping materials have occurred over the last decade. The use of non-woven, disposable materials, impervious layers, and iodophor adhesive drapes are measures directed at reducing the incidence of wound contamination.^{1,3,4,15,18} A paucity of information exists in the literature describing surgical draping techniques for hip arthroplasty. Our objective is to describe a surgical draping technique for use in hip arthroplasty designed to provide a multi-layer barrier between the

patient and the operative field and surgeon to further reduce the possibility of wound contamination and the risk of infection.

Materials and methods

With the patient in the lateral decubitus position, the operative extremity is sterilely prepped. A sterile drape is placed between the lower extremities and above the waist. Sterile towels are linked together and placed in the groin area and at the periphery of the planned operative field (Figure 1). An impervious stockinette is placed over the lower extremity to a level just proximal to the knee. This is followed by an impervious draping layer which is incorporated over the sterile towels. Split extremity drapes are used as the next layer between the extremities and the groin with a half sheet placed above





Figure 2 An impervious draping layer and split extremity drapes define the second draping layer

the waist (Figure 2). Next, an extremity drape is placed over these layers. It is pulled snugly into the perineal area and pulled proximally above the hip and superior margin of the iliac wing. This draping layer is secured proximally with a non-penetrating clamp to the underlying draping layers (Figure 3). This provides a one-layer barrier which covers the lower extremities, abdominal and upper torso area without the necessity of separate cross draping layers. Following the use of the extremity drape, a full length drape is placed lengthwise between the lower extremities as shown in Figure 4. The mid portion of the proximal end of this full length sheet is placed under the knee and distal to the impervious stockinette. The body of this drape is placed up into the groin between the lower extremities to create a recessed area of draping (Figure 5). The corners of the proximal end of this sheet are placed proximally along the anterior and posterior aspects of the thigh and hip region and define the operative field as shown in Figure 6. An adhesive extremity wrap is used to incorporate the lower extremity and this draping layer to a level above the knee (Figure 6). An iodophor impregnated plastic adhesive drape is used to cover the operative field and the margins of this draping layer. The resultant operative field appears as shown in Figures 7-9. Note the recessed area created by the final drape between the lower extremities and groin area (Figure 9). This allows mobilization of the operative extremity without compromising or manipulating the draping and



Figure 3 Incorporation of an extremity drape over the split extremity



Figure 4 A full length drape is placed lengthwise between the lower extremities.



Figure 5 Note the recessed area of draping in the groin region and between the lower extremities

effectively isolates the groin region. This surgical draping technique, along with a lateral Hardinge approach, has been used in 170 hip arthroplasty cases-performed by one of the senior authors (CJL). These cases were done sequentially using the described draping technique along with the use of body exhaust systems and perioperative antibiotics. There have been only three noted deep wound infections in these 170 cases for an infection rate of 1.7%. Violation or contamination of the sterility of the operative field was not noted to occur in



Figure 6 The corners of the full length drape are used to define the anterior and posterior margins of the operative field.



Figure 7 Operative field and extremity as viewed posteriorly.



Figure 8 Operative field and extremity as viewed anteriorly.

Discussion

The potential sources of wound contamination are exogenous (contact, airborne) and endogenous (skin, blood-borne). Operative procedures requiring implantation of foreign materials have increased incidences of secondary foreign body reactions and an increased incidence of infection.^{19,20} Therefore, strict adherence to aseptic surgical technique with emphasis on prevention of potential sources of contamination and infection are



Figure 9 Note the recessed area between the lower extremities and the isolation of the groin region. Mobilization of the operative extremity may be accomplished without manipulation of the draping.

and evaluation will minimize the incidence of endogenous sources of infections. Laminar flow air rooms, body exhaust systems, and perioperative antibiotics have drastically decreased the incidence of perioperative sources of contamination and infection following hip arthroplasty.^{1,2,3,4} Impervious gowns and drapes, iodophor adhesive draping, and the use of a separate pair of outer gloves for draping are surgical innovations and preparation techniques which have minimized operative sources of contamination.^{1,3,4,15,16,18}

Surgical draping is a basic skill learned and exercised by all surgeons. Meticulous attention to surgical draping technique is essential to decrease the possibility of violation and contamination of the operative field. The draping technique we describe is for use in procedures about the hip and specifically for hip arthroplasty. We feel that it is an effective draping technique for hip arthroplasty surgery. It provides a multi-layer impervious barrier between the patient and the operative field and surgeon. The last draping layer (Figure 9) provides a final protective barrier from the groin area while providing a recessed area of drapes that allow for mobilization of the operative extremity for maneuvers required for hip arthroplasty (dislocation/reduction of the hip and prosthesis and evaluation of functional motion following implantation) without manipulation of the surgical drapes and the possibility of compromising the sterility of the surgical field.

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