ORIGINAL ARTICLE

ELIGIBILITY FOR THE HIP-RESURFACING ARTHROPLASTY PROCEDURE: AN EVALUATION ON 592 HIPS

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ABSTRACT

Objective: To investigate the percentage of ideal patients who would be eligible for hip-resurfacing surgery at a reference service for hip arthroplasty. Methods: Out of all the cases of hip arthroplasty operated at Hospital do Servidor Público Estadual de São Paulo (HSPE) between January 2009 and December 2010, we assessed a total of 592 procedures that would fit the criteria for indication for resurfacing arthroplasty, after clinical and radiological evaluation according to the criteria established by the Food and Drug Administration (FDA) and by Seyler et al. Results: Among the total number of hip replacement arthroplasty cases, 5.74% of the patients were eligible. Among the patients who underwent primary arthroplasty, we found that 8.23% presented ideal conditions for this procedure. Conclusion: The study demonstrated that this type of surgery still has a limited role among hip surgery methods.

Keywords – Arthroplasty, Replacement, Hip; Femoral Neck Fractures; Femoral Head

INTRODUCTION

In the 1950s, John Charnley *apud* Seyler *et al*[1] introduced what can be considered to be the first concept of resurfacing arthroplasty, using implants made from Teflon®. The idea was abandoned because of disastrous results early on. At the end of the 1980s, another attempt at resurfacing was made by Wagner, using a metal-to-metal contact surface. Resurfacing was then only reintroduced at the end of the 1990s, with advances in tribology. Nonetheless, there is still much discussion in the medical literature regarding its real indication. On the other hand, it is known that the clinical results are extremely dependent on good patient selection[2-7] and on the details of the surgical technique[4,8-11]. According to the criteria currently used, it is seen that only a small percentage of the patients would be candidates for this technique. This is a matter for concern, given the long learning curve required for this procedure to be performed. According to Nunley *et al*[12], the learning curve for avoiding early postoperative complications involves at least 25 procedures, and to achieve good postoperative radiographic parameters, 75 to 100 procedures. In this light, we conducted the present study with the aim of ascertaining the eligibility of patients who could undergo hip-resurfacing arthroplasty (HRA) in our setting and, through this, to investigate the viability of capacitating hip surgeons to perform this technique.

OBJECTIVE

The aim of this study was to quantify the number of patients who might have been eligible for the technique of HRA at the Orthopedics and Traumatology Clinic of the State Public Servants' Hospital (Hospital do Servidor Público Estadual, HSPE) in the years 2009 and 2010, out of a total of 592 hips that underwent hip arthroplasty.

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MATERIAL AND METHOD

A survey of all the orthopedic surgical procedures performed between January 2009 and December 2010 at HSPE was conducted. Among these, there were 592 hip arthroplasty procedures, of which 41% were on male patients and 59% on female patients. The patients' mean age was 60.3 years, with a range from 27 to 98 years. Through our database, we were able to initially screen the patients to exclude those for whom HRA would not be applicable because of the presence of femoral neck fractures, and also those who underwent hip revision arthroplasty, totaling 139 (23%) and 40 (7%) of the patients respectively (Figure 1).

The second step of our investigation consisted of a clinical evaluation, by means of reviewing the medical files, and a radiographic evaluation, through assessing radiographic examinations in anteroposterior and lateral views on all the hips that had been operated using the standard technique. These examinations were all performed within the last preoperative month. In reviewing the medical files, we looked for data on previous pathological conditions such as neuromuscular and vascular diseases, diagnoses of osteoporosis or family histories of this, kidney failure (also assessed through preoperative examinations), obesity, acquired immunodeficiency syndrome, chronic use of corticoids or other immunosuppressants, or hip diseases during childhood. The assessments on the radiographic examinations consisted of quantifying the extent to which the femoral head was compromised in cases of osteonecrosis, the presence of cysts and their sizes, the presence of osteoporosis, assessed according to parameters defined by Singh *et al*[13] (such that cases classified as grade 3 or lower were classified as osteoporosis), dysplastic abnormalities of the hip, signs of femoroacetabular impact and presence of Legg-Calvé-Perthes disease. Access to the radiographs was possible through images retrieved from the digitized system for imaging examinations at HSPE. The assessments on the medical files and radiographic examinations were done in conjunction by two residents of orthopedics and traumatology at HSPE, one orthopedist who was a specialist in hip surgery and two experienced hip surgeons.

In this second stage, among the 413 patients who remained, we applied the criteria for contraindication of HRA of the United States Food and Drug Administration (FDA)[14,15]. These criteria involved the following clinical parameters: active infection in the organism; skeletal immaturity; clinical situations presented by patients that might compromise the stability of the implant (muscle atrophy, neuromuscular diseases and vascular insufficiency); women of fertile age (limit of 45 years); kidney failure; severe obesity (body mass index greater than 40 kg/m^2); patients with immunological depression (due to acquired immunodeficiency syndrome, use of corticoids at immunosuppressant doses or use of other immunosuppressant agents); and known sensitivity to metal. The radiographic parameters included: osteoporosis; osteonecrosis affecting more than 50% of the femoral head; multiple cysts or cysts larger than 1 cm; questionable bone stock, defined as bone mineral density lower than 0.65 g/cm^2 or a T-score lower than –1 on bone densitometry[16] (Table 1). At this stage, 292 patients presented contraindications according to the FDA criteria. The main contraindications among females were osteoporosis (the most prevalent contraindication) (Figure 1), use of immunosuppressants (particularly in cases of rheumatoid arthritis) and fertile age. Among males, the main contraindications were cases of a compromised femoral head (more than 50% affected), with or without associated multiple cysts larger than 1 cm; and osteoporosis. There were no cases relating to allergy to metal or cases of infection.

Figure 1 – (A) compromising of the femoral head greater than 50%; (B) femoral neck fracture; (C) multiple cysts.