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Variation in Use of Postoperative Precautions and Equipment Following Total Hip Arthroplasty: A Survey of the AAHKS and CAS Membership

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ABSTRACT

Background: A traditional method to reduce dislocation risk following total hip arthroplasty involves prescribing postoperative precautions and ambulatory equipment to patients. The purpose of this study was to determine the prevalence of postoperative precaution and equipment use among North American arthroplasty surgeons for patients undergoing primary total hip arthroplasty.

Methods: We conducted a survey of American Association of Hip and Knee Surgeons and Canadian Arthroplasty Society members using an electronic questionnaire format to determine how often precautions and equipment were prescribed, and whether their use was associated with surgical approach and other surgeon demographics.

Results: Of the respondents, 44% universally prescribed precautions while 33% never prescribed precautions. Use of the posterolateral approach, surgeon experience, and larger head size use were significantly associated ($P < .01$) with precaution and equipment use. Direct anterior approach surgeons were significantly less likely to prescribe precautions ($P < .0001$) and significantly less likely to prescribe equipment ($P < .0001$).

Conclusion: Although postoperative precautions continue to be used to some degree by the majority of members, their consumption of healthcare resources through utilization of additional care providers and purchasing of equipment, known association with reduced patient satisfaction, and lack of supporting evidence make them a target for future scrutiny.

Dislocation following total hip arthroplasty (THA) is a relatively common complication, with a reported incidence that ranges from 0.3% [1] to 10% [2] after primary surgery. Proper component positioning, restoration of both offset and leg length, and meticulous soft-tissue repair comprise the surgical principles for achieving a stable and durable THA [3]. A traditional method to reduce dislocation risk is to instruct patients to restrict their activities in the early postoperative period to permit soft-tissue repair healing and periarticular muscle strengthening to occur. The use of such precautions is endorsed by the recognized importance of capsular and soft-tissue repair [4], the effect of muscle deficiency on THA stability [5], and case series of high early dislocation rates [6]. However, with the increasing use of muscle-sparing approaches such as the direct anterior approach (DAA), routine use of larger (≥28 mm) head sizes, and a focus on fast-track recovery with early mobilization, use of postoperative hip precautions has become more recently scrutinized.

Recent orthopedic literature has challenged routine use of postoperative precautions, citing improved patient experience and equivalent dislocation rates. A recent survey of 97 patients who underwent primary THA revealed that only 22 (22.6%) fully complied with their precautions and two-thirds claimed the precautions stopped them from desired activities [7]. A recent meta-analysis reported increased patient satisfaction, better sleep,

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earlier return to driving, and earlier mobilization without ambulatory aids when postoperative precautions were relaxed [8]. With regard to dislocation rates, 2 randomized trials using the anterolateral approach reported no significant increase in dislocations when range of motion as well as driving restrictions were removed [9,10]. Retrospective comparison studies have shown similar results for the posterolateral approach [11–13]. However, a nonrandomized, prospective study of 365 patients undergoing the posterolateral approach did find a 2-fold increase in early dislocations, although this difference did not reach statistical significance [14].

The decision to ease or even remove postoperative THA precautions is not necessarily easy for arthroplasty surgeons given the otherwise excellent long-term performance of THA and high risk of revision surgery if dislocations recur [15]. Yet resistance to such change is being challenged by increasing patient demands and mounting evidence that postoperative precautions are not necessary after uncomplicated modern THA. It is currently not known to what extent precautions are being used by surgeons, and the nature of these precautions. High-quality trials evaluating the impact of precautions are also needed, but current practice to inform these trials is missing. The purpose of this study is to survey the membership of both the American Association of Hip and Knee Surgeons (AAHKS) and Canadian Arthroplasty Society (CAS) to determine (1) what is the prevalence of postoperative precautions in North America following primary THA? and (2) if precautions are used, how long are they maintained and what equipment is recommended? Data on surgical approach, head size, and surgeon experience were also collected to determine whether any statistical relationships existed between these variables and precaution use.

Materials and Methods

We surveyed the AAHKS and CAS membership with an 8-item response questionnaire (Fig. 1) over a 3-month period, from October 2017 to December 2017. This study was approved by our institutional review board and received approval by both the AAHKS and CAS research committees. Initial survey questions were designed following a review of published THA precaution and instability literature from 2012 onward and then edited via consensus from all study authors. A presurvey power analysis was performed, based on survey sample size estimation described by Dillman et al [16]. Using a 95% confidence interval with a 5% sampling error, it was determined that a 14.9% response rate (327 respondents) was needed. The research design for this study was a 1-stage self-administered descriptive survey of all 2051 AAHKS members and all 140 CAS members. Both memberships were contacted via e-mail with a prenotice, cover letter, and link to an electronic, anonymous survey instrument (SurveyMonkey Inc, Palo Alto, CA). Initial nonresponders were sent a reminder to complete the survey after 2 weeks.

Respondents answered questions regarding years in practice, surgical approach used for THA, use of precautions, equipment patients used for precautions, and involvement of other clinical team members (nurses, physical therapists, occupational therapists) with teaching precautions. Results of all questions were tabulated and descriptive statistics for each response and its category were calculated. Ordinal variables were then compared using chi-square and Cramer's V (φ_c) to determine whether significant associations existed and what the strength of associations was. All statistical calculations were performed using SPSS version 23 (SPSS Inc, Chicago, IL). For all comparisons, differences were considered significant at P values less than .05.

Results

Only 695 of 2051 AAHKS members (33.9%) and 69 of 140 CAS members (49.3%) completed the survey, satisfying the presurvey power analysis. Also, 609 of the 764 respondents (79.7%) were identified as being in independent practice for over 10 years and almost half (361; 47.3%) were in practice for over 20 years. The posterolateral approach was the most common surgical approach used (385, 50.5%), followed by DAA (274, 35.9%) and the direct lateral approach (104, 13.6%). A third of respondents reported providing no postoperative precautions to patients following THA (252, 33.0%) while almost half (338, 44.2%) reported providing precautions to all patients (Table 1). When precautions were provided, the most common duration was 5-6 weeks (252, 49.2%), followed by more than 8 weeks (139, 27.1%). When comparing precautions and surgical approach, use of the posterolateral approach was associated with significantly higher precaution use compared to the DAA ($\varphi_c = 0.49$, $P < .0001$; Table 2). Surgeons who used the posterolateral approach were also significantly more likely to use a larger head size compared to other approaches ($\varphi_c = 0.29$, $P < .0001$). There was, however, no significant association between preferred head size and use of precautions ($P = .171$) nor surgical approach and duration of precautions ($P = .334$).

With regard to the type of precautions taught, surgeons using the posterolateral approach applied restrictions to flexion, internal rotation, and adduction significantly more often, while DAA surgeons restricted more often extension and external rotation (Table 3). With regard to equipment required to fulfill postoperative precautions, the 3 most commonly prescribed items were a raised toilet seat (335, 65.4%), a pillow to place between the legs when sleeping (255, 49.8%), and a "grabber/reacher" to pick up objects (223, 43.6%). DAA was significantly associated with no equipment prescribed postoperatively ($\varphi_c = 0.22$, $P < .0001$). Conversely, a raised toilet seat ($\varphi_c = 0.20$, $P < .0001$), pillow between the legs ($\varphi_c = 0.21$, $P < .0001$), and grabber/reacher ($\varphi_c = 0.18$, $P < .0001$) were all more likely to be prescribed with the lateral and posterolateral approaches. Physical therapists were reported as being the most common members of the clinical team that taught postoperative precautions (516, 67.5%), followed by nurses (281, 36.8%). Over a quarter of respondents (214, 28%) reported not being aware of other providers on their team teaching precautions to patients.

Significant associations were identified between precaution use and surgeon demographics. More experienced surgeons reported using the posterolateral approach significantly more often, while less experienced surgeons used the DAA ($\varphi_c = 0.11$ $P = .004$) significantly more often. More experienced surgeons were significantly more likely to use precautions ($\varphi_c = 0.11$, $P = .022$) and use larger head sizes ($\varphi_c = 0.11$, $P = .024$). Less experienced surgeons, although less likely to use precautions, were significantly more likely to apply precautions for a longer duration postoperatively ($\varphi_c = 0.17$, $P = .001$). With regard to geographic location, precautions were significantly more commonly used by CAS members compared to AAHKS members ($\varphi_c = 0.10$, $P = .008$).

Discussion

The introduction of bundle care payment reimbursement models for total joint arthroplasty was instituted primarily to control healthcare costs and also to favor quality improvement initiatives. With the demand for primary joint arthroplasty across North America expected to increase several fold over the coming decade, every aspect of perioperative care around joint arthroplasty will be appraised. The numerous costs associated with postoperative precautions (preoperative pamphlets, preoperative