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Functional Discharge Criteria In Total Hip Arthroplasty. What Makes The Difference For Overnight Hospital Stay In Our Center?

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Abstract

Overnight total hip arthroplasty is becoming common in our center. Despite all the patients are under the same protocol, which includes a functional discharge criteria, not all the patients leave the hospital the day after the surgical procedure. We conducted a study evaluating a group of patients who stayed one night, compared to a matched pair regarding age, body mass index and sex. Group 1 mean age was 61.4 years-old (SD 9.3), Group 2 was 60.8 years-old (SD 9.6); 10 women and 20 men each group, BMI was 28.1 (SD 3.7) and 27.8 (SD 3.6) for Groups 1 and 2 respectively. Patients who stayed only 1 night after THA were found to have higher levels of preoperative hemoglobin, had uncommonly 2 or more major comorbidities, and the operation was predominantly performed by anterior approach.

Keywords

Overnight, Total hip arthroplasty, Functional Discharge Criteria, Length of stay, Fast Track, Rapid Recovery.



Introduction

During the last years, there has been an increased interest in implementation of fast-track protocols for total hip arthroplasty (THA) (1). Nowadays multiple centers have improved their protocols, allowing to provide a treatment that requires a length of stay (LOS) lower than 24 h, meaning that the patient has to stay just one night at the center. This is also known as overnight total hip arthroplasty. Some other centers, with deeper knowledge and experience in fast track arthroplasty, are providing ambulatory THA (2,3). While this is can occur for some patients, for some others the aimed short stay is not achieved, and many contributing factors have been described.

Overnight hospital stay for THA began in our center in 2016 with just a few cases, but the figures have recently increased. This has happened related to the implantation of a functional

discharge criteria under a rapid recovery protocol. We aim to evaluate our evolution on overnight total hip arthroplasty, the profile of patients that achieved such a rapid recovery and to determine the possible complications related to this early discharge.

Material and methods.

From July 2016 to August 2018, 566 THAs were implanted at our Hip Unit under a fast track protocol. Previous to surgery, at least four weeks before, all the patients underwent an educational session by a nurse and a physiotherapist. The methodology and benefits of this educational session (also called empowerment session) at our center have been published previously regarding total knee arthroplasty (4). During this session all the details of what is going to happen are explained to the patient and also to a familiar or to a

caregiver responsible for the patient, when required. The information includes an explanation of the type of anesthesia, the surgery, the meaning of the functional discharge criteria, recommendations on what to bring to hospitalization and also indications of what to practice at home until surgery: physiotherapy exercises, transfers and how to walk on crutches; all of them are practiced in situ by the patients in the session. The number of patients scheduled for this sessions range from 5 to 7 patients.

During the session the patient and relatives are allowed to ask any question they have as it is proposed as an interactive meeting, hence patient-family-caregiver can resolve all their doubts. The patients were evaluated preoperatively by an anesthesiologist, in order to assess and ameliorate their medical comorbidities, with special emphasis in optimizing preoperative hemoglobin.

Surgery was performed under regional anesthesia, with intravenous tranexamic acid 10mg/Kg bolus during 20 minutes to end 10 minutes before the beginning of the surgery. After, a continuous intravenous perfusion 2mg/Kg/h was administered until the end of the surgery. In June 2018 we introduced the use of intravenous dexamethasone, 8 mg previous to the surgery, as it has been proposed in order to prevent postoperative nausea and vomiting and to decrease postoperative pain (5).

The surgical approach were the Modified Hardinge Approach (MHA), modified by Moskal, and the direct anterior approach (DAA). 5 different surgeons performed the procedures; 4 performed MHA, and one DAA.

All the cases underwent a preoperative digital planning with a methodology previously described by our team (6), and total hip arthroplasties were intraoperatively assessed using radiology. In the studied patients, all the implanted arthroplasties were non-cemented. No drains or urinary catheters were used for any of the patients of both groups.



Fig 1. Patient walking the first postoperative day of right total hip arthroplasty. Walking aid with one crutch.

After the surgery early mobilization was indicated for all the cases, aimed to start from 3 hours after the surgery. For patients who underwent surgery being the last case of the afternoon, usually ending between 8 and 9 p.m., the first mobilization was performed the morning after. Postoperative medication was oral in all the cases, and opioids were only administered as a rescue in case on intense pain. No local infiltrations or blocks were performed in any case. Walking was performed with two crutches, but patients tolerating the use of one crutch were stimulated to use one crutch for short distances (Fig. 1)

Table 1. Functional Discharge Criteria

- Able to enter and leave the bed independently (alone or with minimal aid)
- Tolerates seating, and raises by her/his own from seating position, able to walk to go to bathroom without being aided.
- The patient gets dress by himself (alone or with minimal aid).
- Walk > 50 m (with crutches).
- Can walk stairs up and down.
- Pain < 5 with mobilisation.
- Pain <3 while resting.
- No nausea, dizziness or vomits.

For all cases, discharge was decided by the surgeon or by the internal resident, accordingly to a Functional Discharge Criteria (Table 1). In all the cases, in the moment of discharge, the patient has to feel confident, and accept voluntarily to be discharged home. Also a relative has to be available to support them at home during the first postoperative days.

After discharge, a telephonic assessment was performed by the nurse in the educational team, and the patient was referred to the primary care center to remove staples 2 weeks after the surgery. All the patients were programmed for their first visit with the surgeon 1 month, 3 months and 6 months after the surgery, and a radiological study was performed for each visit.

31 THA in 30 patients were discharged the day after the surgery (Group 1), which implies a length of stay (LOS) inferior to 24 hours. Those patients meet the requirements for the functional discharge criteria.

Electronic Medical Health Records were reviewed to determine the characteristics of these cases compared to an individualized control group of 31 THA in 30 patients who underwent surgery under the same period of time, matched by age, sex, and body mass index (BMI) (Group 2), but did not meet the functional discharge criteria. Those last were discharged after two night or more; with a LOS superior to 24 hours.

Table 2. Demographic characteristics of the present series, regarding the matching criteria for the two groups.

	Group 1	Group 2	p
Sex	10 women/20 men	10 women/20 men	> 0.05
Age	61.4 years-old (SD 9.3)	60.8 years-old (SD 9.6)	> 0.05
BMI	BMI 28.1 (SD 3.7)	BMI 27.8 (SD 3.6)	> 0.05

In order to select the cases for Group 2, a selection was performed from the Hip Unit Database, by means of matched-pairs. Matching criteria were: same sex, age +/- 9 years; BMI +/- 4 kg/m². The table 2 shows the characteristics of Group 1 and Group 2.

The following variables were assessed for each group: surgical approach (Direct Anterior Approach and modified Hardinge), preoperative hemoglobin, surgical time, ASA classification, comorbidities dividing patients between those with two or more major comorbidites and those with less than two, complications and mortality.

The statistic analysis was performed using OpenEpi, available at <http://www.openepi.com>. Kolmogorov-Smirnov test was performed to determine those variables with a normal distribution. T-Student test was used to compare

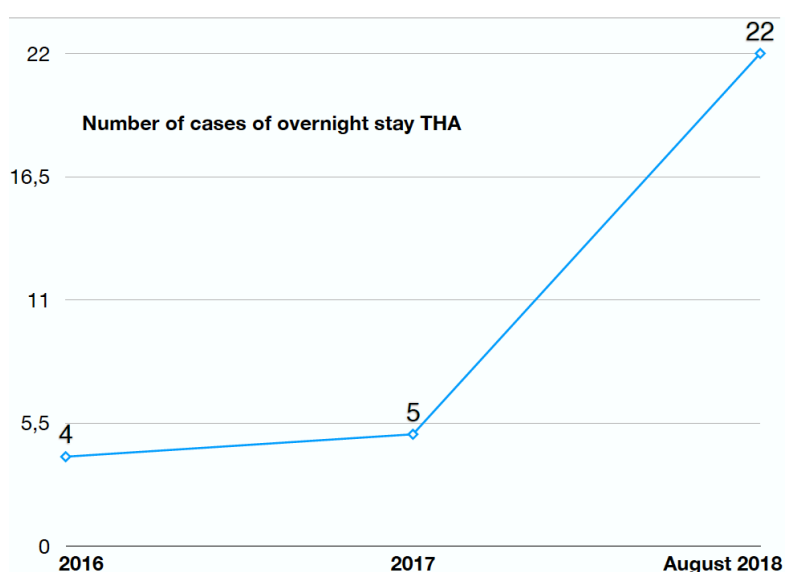


Fig. 2. Evolution of overnight THA at our center. A fast increase occurred in 2018.

continuous variables, and X^2 test for dicotomic variables. Statistical significance was established with $p \leq 0,05$.

Results.

A discrete increase in the number of cases of overnight THA was observed from 2016 to 2017. However, the number increased markedly from 2017 to 2018 (Fig. 2).

Hospital stay for Group 1 was 1 night and for Group 2 was 3.4 nights (SD 2.9, range 2-9). The direct anterior approach was performed in 20 THA in Group 1 and 8 THA in Group 2, while Hardinge approach was performed in 11 THA in Group 1 and 23 cases in Group 2 ($p < 0.05$). Preoperative hemoglobin was 147.9 g/L in Group 1 and 137.2 g/L in Group 2 ($p < 0.05$). Surgical time for Group 1 was 99.9 minutes (SD 25.3) while for Group 2 was 106.7 minutes (SD 58.4) ($p = 0.5$). Regarding ASA classification of physical status, THAs in Group 1 were 12 ASA I, 13 ASA II and 6 ASA III. For Group 2 they were 7 ASA I, 15 ASA II and 7 ASA III. Two or more major comorbidities were present in 4 patients in Group 1 and in 14 patients in Group 2 ($p < 0.05$).

The two groups did not show different rate of complications in the postoperative follow-up up to 3 months. Group 1 presented 3 patients consulting to the emergency department: one aching knee pain, 1 wound persistent drainage, and one surgical wound haematoma. From Group 2, two patients presented to the emergency department; one with wound hematoma and one with pain. None of the patients deceased during this period.

Discussion.

There are several classifications regarding the terminology that defines the moment of discharge. We used a practical classification including two groups: 1) after one night, 2) after two or more nights. We have to clarify that some cases in the Group 1 were operated the last case in the afternoon and they were discharged the morning after, being less than 12 h at our center. However we did not analyze this subgroup for the purpose of this study.

Our study shows a clear trend to increase the number of patients discharged the day after surgery. This could be related to the beginning of use of dexamethasone, but also to

the normalization of this very short stay to be understood as safe and effective, since, to our best knowledge, it was never done before in our country. We consider that the satisfactory evolution of the first cases allowed the health professionals to feel confident and to transmit this confidence to their patients. We aimed to determine what was different; what made some patients to stay at the hospital during more time while the protocol was exactly the same.

There are several limitations we recognize in this study. First, the low number of patients. However it has been tried to be compensated by using the matched pair analysis. Second, and important regarding the surgical approach, only one surgeon was performing DAA. Third, we analyse the very first cases of overnight and despite there is not intended selection for early discharge, there might be a bias with a trend to be more confident to discharge healthier patients. Finally, the discharge criteria was applied by surgeons and/or residents; their perceptions on the fulfillment of the discharge criteria could differ, and also some could be more enthusiastic than others in starting to observe early discharges despite the protocol was clear.

Despite the limitations, we consider that the results of this study illustrate that those more complex cases regarding the presence of comorbidities tend to stay longer. Interestingly, those patients with higher levels of preoperative hemoglobin were discharged earlier. This could be a surrogate value related to comorbidities, since several chronic diseases are related to anemia. Regarding the surgical approach, this study points to direct anterior approach in order to ease early discharge. Despite the study was not designed to evaluate DAA versus Hardinge, many other well designed studies agree with this hypothesis (7,8). Also interesting to observe, the use of the modified Hardinge approach also allowed the discharge the day after surgery for some of the patients; in other words, a transgluteal approach can also achieve satisfactory overnight THA patients.

On the other hand, we confirmed that performing THA with just one night stay was safe in our experience, without higher complications regarding patients who stay two or more nights. However, important to notice, the discharge is always agreed with the patient, who must feel confident to proceed to return to home.

We consider that these satisfactory results are encouraging, and with further experience we consider the implantation of ambulatory total hip replacement in a near future in our center. This introduction to ambulatory total hip arthroplasty is recommended to be performed as a transition, with previous experience in short stays and a culture of several years of work in fast track guidelines implementation. Ambulatory total hip replacement can be controversial, but many studies, both retrospective and prospective, show us that it can be performed safe and effectively (9).

Conclusions.

We conclude that in our center, under the same functional discharge criteria, patients who stayed only 1 night after THA were found to have higher levels of preoperative hemoglobin, had less comorbidities, and the operation was predominantly performed by anterior approach.

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Conflicts of interest statement

The authors certify that they have no affiliations with or involvement in any organisation or entity with any financial interest, or non-financial interest in the subject matter or materials discussed in this manuscript.

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