



# Successful initial experience with a novel outpatient total hip arthroplasty program in a public health system in Chile

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Received: 19 December 2017 / Accepted: 27 February 2018 / Published online: 21 March 2018  
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## Abstract

**Purpose** The aim of the present study was to assess the first experience with outpatient total hip arthroplasty (THA) in a public health environment in Chile.

**Methods** Prospective series of the first 69 patients/72 hips. Surgery was performed in a public university-affiliated hospital. The patients were 64 (31–84) years old and healthy (ASA I–II) candidates for a primary hip arthroplasty.

**Results** The outpatient track had 52.2% of arthroplasty candidates included and 94.4% (68/72 hips) were successfully discharged the same day. There were no emergency room visits during the first week after surgery. Two patients had single dislocation episodes, one requiring stem revision. There was one deep vein thrombosis. There were no other complications. All the patients reported to be satisfied with the outpatient track.

**Interpretation** An outpatient track can be developed in a safe manner in this healthcare setting and population. This track of care was well accepted by the patients.

**Keywords** Total hip arthroplasty · Length of stay · Outpatient surgery · Osteoarthritis

## Introduction

Total hip arthroplasty (THA) has usually been considered an inpatient procedure. During the last years, better anesthesia/analgesia techniques and early mobilization permitted shortening the length of stay (LOS) after THA from 14–21 days in 1975 to four to five days [1–3]. Aging and more frequent indication of THA create a tremendous demand on health services. This demand not only affects waiting times, but also impacts hospital bed and operating

room (OR) usage. In the last ten years, some authors have published their experience in fast track surgery for THA, accomplishing equivalent patient care with LOS of up to two days, some reporting less complications and higher patient satisfaction [4–6].

Shorter LOS reduces total costs and waiting time from procedure indication to surgery, both of which have created a trend towards this modality of care [5, 7, 8]. Scant reports describe the characteristics and results for outpatient THA, reporting safe outpatient programs [9, 10]. Two similar recent reports analyzing big databases of total joint replacements (TJRs) show outpatient programs as safe as inpatient and even with less complications. Between 2011 and 2014, 0.7% of TJRs were performed as an outpatient in the USA [11].

In 2014, a pilot program for outpatient TJR was designed and implemented in our hospital. This design followed the path signaled by successful European experiences with some adaptations to local context.

The aim of the present study was to assess the first experience with outpatient THAs in Hispanic and Spanish-speaking population and report complications and patient satisfaction.

Our hypothesis states that with outpatient THA modality there will be no increase in major complications.

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## Patients and methods

This study was carried at a public university-affiliated hospital. It was approved by the Institutional Review Board and informed consent was waived for all patients before being included in the outpatient track.

Between December 2014 and August 2016, 138 patients waiting for a primary total hip arthroplasty were assessed for inclusion in the outpatient arthroplasty program. During a visit to the clinic, patients who were thought to be suitable for the outpatient management modality were told about the program and asked for their agreement. First inclusion criteria was to feel comfortable with outpatient modality management.

Patients were appointed for an interview with the outpatient program nurse and a physical therapist visited every patient's home. During the interviews and home visit appropriateness for the program was assessed, patients were trained for using walking aids and the inclusion-exclusion criteria were reviewed in situ. Patients and family were instructed after surgery care, and questions and fears were addressed.

Candidates were healthy patients (ASA I–II), with primary osteoarthritis and an adequate family support. Patients with comorbidities requiring close observation (anticoagulation or insulin users) were excluded. The patient's flow diagram is in Fig. 1 and the inclusion/exclusion criteria are detailed in Table 1.

All surgeries were performed through an anterolateral or direct lateral approach. Regional anesthesia was preferred and multimodal opioid-sparing analgesia was

used. Local infiltration of anaesthetics (LIA) with chirocaine was used as a standard. One gram of tranexamic acid was administered before incision. No drains were used.

Before and during surgery, nausea was prophylactically and actively managed with dexamethasone 4–8 mg and ondansetron 4–8 mg.

Starting time, surgery duration and post-operative hospital stay were registered.

After surgery, patients were transferred to the Post Anesthesia Care Unit (PACU) where multimodal opioid-sparing analgesia and aggressive fluid load (IV and oral) were continued. Post-op x-rays and haematocrit/haemoglobin were tested before discharge. Patients did not receive physical therapy (PT) before discharge.

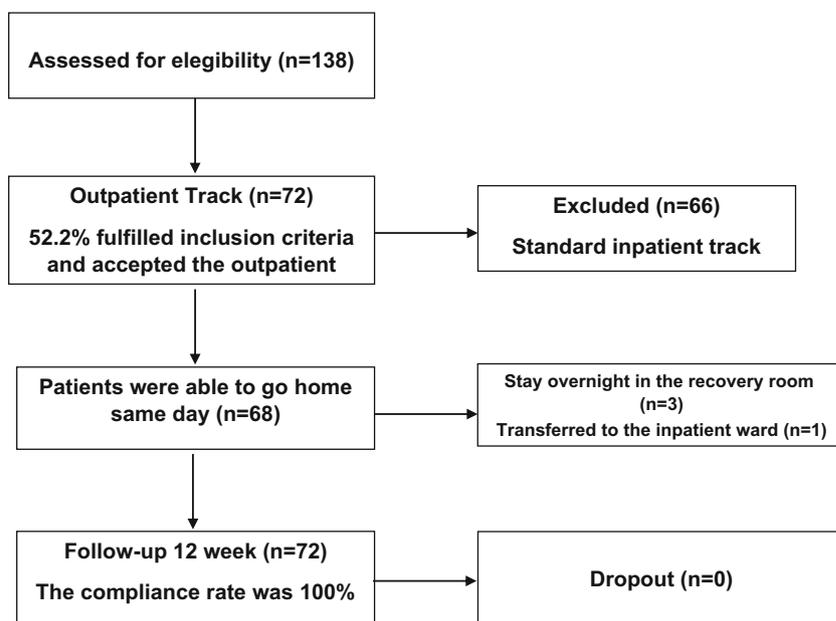
Post-operative analgesia consisted of acetaminophen 1 g IV, ketorolac 30 mg IV, and the short-acting opioid fentanyl 25–100 µg IV; finally before discharge, 75 mg IV diclofenac was administered.

Discharge criteria were as follows: adequate pain control (VAS  $\leq 4$ ), being able to eat and drink, absence of nausea, orthostatic symptoms, and haemoglobin  $\geq 7$  mg/dL; resolution of motor blockage and dry wound draping were also required.

Patients were transferred home in an ambulance with supervision of the physical therapist, with instructions of bed rest until visit by the nurse and physical therapist the next morning.

During the first PT visit (the morning after the surgery), patient and family were educated in dislocation

Fig. 1 Patient's flow diagram



**Table 1** Inclusion and exclusion criteria for the outpatient care track

Inclusion criteria	Exclusion criteria
ASA I–II	Insulin user
Simple primary THR	Anticoagulated
Adequate family support	Chronic renal failure (creatinine clearance < 60 mL/min)
	High dysplasia, post-traumatic osteoarthritis
	Previous surgery with retained implants
	Family care not available 24/7
	Phone not available 24/7
	Living in a second or higher floor with no lift available

precautions. Exercises started with quadriceps and gluteus isometric contractions and active movements of the ankle, as tolerated patients sat in the bed and stood. If no orthostatic intolerance was evidenced, walking with full weight-bearing assisted by a walker or two crutches was the final goal of the first visit [12]. Further sessions included quadriceps and gluteus open chain exercises, stair training, and walking in the street [13]. Home visits were scheduled every 24 hours for a maximum of three days, and there on every 48 hours afterwards for up to two to three weeks. During the visit, in case of severe pain (VAS > 4) despite acetaminophen plus tramadol, intramuscular diclofenac 75 mg was given. Weight-bearing as tolerated with a walker or two crutches was indicated starting during the first PT visit.

For venous thromboembolic prophylaxis, rivaroxaban 10 mg daily for 21 days after discharge was prescribed.

Follow-up was scheduled at discharge at two to four and 12 weeks post op. Every patient and responsible family member received a mobile phone number for contact in case of need.

Complications requiring nurse call, home visit, re-admissions, or re-operations were documented (including pain, dizziness, symptomatic anemia, nausea, deep vein thrombosis or pulmonary embolism, wound problems, bleeding, falls, dislocation, periprosthetic fracture, and infection).

Level of satisfaction was evaluated with two questions:

- 1) If the patient would choose to perform the surgery again as an outpatient
- 2) If he/she would recommend this track of care

Data normality was tested using with the Kolmogorov-Smirnoff test. As results were not normal, median and range are reported if not stated otherwise.

## Results

During study period, 69 patients/72 hips were operated within the outpatient track. The time lapse between first and second outpatient hip replacement for those three cases of bilateral hip arthritis was four months (3–5 months).

In the study time frame in which 72 hips were selected for the outpatient track, other 66 hips were enrolled for the standard inpatient track representing a 52.2% of inclusion for the outpatient track.

Patient's characteristics are described in the Table 2.

Surgical time was 72 (+– 18) minutes. Patients remained in the recovery room for five (3–22) hours after surgery.

There were no intra-operative complications.

There were no transfusions in this group of patients.

Sixty-eight of the seventy-two (94.4%) cases were able to go home the same day.

Three patients stayed overnight in the recovery room, two because of nausea and one because the arranged transport to home failed.

One patient stayed for four days. She was transferred to the inpatient ward because of prolonged anesthesia effects, referred as persistent paresis and paresthesia.

There was no loss of follow-up and every patient completed the satisfaction survey.

Regarding outpatient PT, 90.3% of the patients were able to stand and walk in the first visit and the rest (9.7%) in the second PT visit. Reasons for not being able to walk were orthostatic intolerance in four cases and pain in three.

The outpatient program nurse received nine phone calls from nine patients, eight of them during the first two days after discharge. The reasons for nurse calls were pain in seven cases and nausea in two.

There were no emergency unit (EU) visits by any of the studied patients during the first week after surgery.

One patient had a hip dislocation two weeks after surgery. Subsidence of the femoral stem was noted and was revised to a cemented stem with no further complications.

**Table 2** Patient characteristics

Age (years)	64 (36–81)
Sex	
Male	40
Female	32
BMI (kg/m <sup>2</sup> )	28.3 (20.5–38.6)
ASA (%)	
I	50
II	50
Primary osteoarthritis (%)	77.8

BMI, body mass index; ASA, American Society of Anesthesiologists

One dislocation four weeks after surgery was reduced in the EU, with the patient being discharged after two hours in the recovery room, without further complications.

One case of symptomatic deep vein thrombosis was detected. There were no coronary events, infections, or any other major medical complications in the cohort during the three months of follow-up.

At six weeks, 72/72 reported to be satisfied with the outpatient track and referred that they would choose this track again and recommend being operated upon as an outpatient. Three patients in this series had both hips treated having decided to have the second joint operated also as an outpatient. No patient asked for the inpatient track for a second joint.

## Discussion

Our study reports the first experience with outpatient THA in the southern hemisphere, with Spanish-speaking population. It has a relatively open inclusion criteria regarding age and starting time for the surgery. Considering that particularities, the 94.4% of same-day discharge is promising.

Many authors have published their progress implementing fast track arthroplasty replacement programs, with heterogeneous levels of strictness for inclusion/exclusion criteria and LOS ranging from two to five days [3].

Only a few reports about outpatient programs for THA are available, limiting the data to a case series, and only one recent randomized trial also reported similar outcomes comparing with traditional inpatient tracks [10, 14, 15]. Some have limited the inclusion for the first case in the morning [16]. Even more, some of those reports included patients delivered from the hospital to an intermediate care facility, but still not discharged to their homes.

Previous published data reports 75–88% success in same-day discharge with different protocols, some more restrictive than others, considering successful outpatient up to 23 hours inside hospital facilities [10, 14, 15].

Our study has potential limitations; as this is the first report of the outpatient program the sample size is small, there is no control group to compare with inpatients and the follow-up might be considered short. Patient satisfaction was evaluated, but patient-reported outcomes might be included in the future to enhance the quality of the register and also might identify patients at risk for revision [17].

Our health system required to adapt some specific parameters of the protocol (absence of physical therapy in the hospital after surgery) which might reduce the external validity of the results, although these particularities might motivate other groups to adapt known protocols to local realities.

The three month follow-up is a short period for arthroplasty outcome evaluation, but it is the period in which more differences between this two care tracks may appear.

In our series, one patient unable to be discharged the same day after the surgery had the procedure completed after four pm, leaving no time for managing the symptoms and performing the workup before the end of the journey. Most of the outpatient protocols require the surgery to be scheduled as the first or second surgery of the day. Because of local administrative restrictions, many of our THA are being started after four pm. Lack of safe mobilization has been reported to be the main cause for failed same-day discharge. As our protocol starts physical therapy the first day after surgery (at home), this was not considered a problem [18].

None of the complications/readmissions reported in our cohort could have been prevented with a longer inpatient care as none of them occurred during the first two to three days after the surgery. This is in line with previous reports, with no increase in complications with shorter LOS [14, 15, 19]. There is one report of an increasing incidence of hip dislocations with shorter LOS, but the same has not been reproduced in more recent series [20]. For patients with high risk of dislocation, dual mobility cups might be considered in the future as high level of satisfaction and low index of complications have been reported recently [21, 22].

Despite the low incidence of complications and high index of satisfaction reported by this cohort, complex cases may not be suitable for outpatient care as they implicate longer procedures, higher blood loss, and more complications (i.e., dysplastic and post-traumatic cases).

Age was not considered to be the exclusion criteria in this pilot program, with a broad range of ages with a median of 64 years old (36–81). Older patients had a high degree of satisfaction and did not present more complications. Nevertheless, patients 70–81 years old are under represented, which might explain our disparities with some published data where patients older than 70 years old presented more complications [11].

In summary, this relatively open protocol appears to be safe and was well accepted by the patients. In this cohort undergoing outpatient THA, 94.4% were able to go home the same day of the surgery.

## Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

**Ethical approval** This study was approved by the Institutional Review Board.

**Informed consent** Informed consent was obtained from all individual participants included in the study.

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