Revista Española de Cirugía Ortopédica y Traumatología 69 (2025) T504–T511

Revista Española de Cirugía Ortopédica y Traumatología

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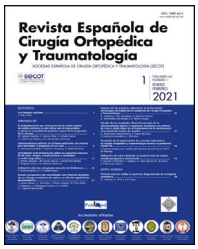

ORIGINAL PAPER

[Translated article] Evolution of the rapid recovery program to outpatient surgery in total hip arthroplasty

S.M. Miguela Alvarez*, A. Bartra, M. Novellas, M. Surroca, F. Anglès

Mútua de Terrassa Fundación Asistencial, Spain

Received 30 May 2024; accepted 16 October 2024
Available online 12 June 2025

KEYWORDS
Hip;
Total hip prosthesis;
Arthroplasty;
Outpatient;
No income

Abstract
Introduction: The implementation of enhanced recovery programs has transformed total hip arthroplasty (THA) surgery. Outpatient prosthetic surgery is a safe and beneficial technique. Few centers in our country perform outpatient total hip arthroplasty (OTHA). We present the preliminary results of our experience.
Material and method: This is a prospective observational study conducted in 2023 with a sample of 30 patients proposed for THA following an outpatient surgery protocol by the orthopedic surgery and traumatology service.
Results: In 2023, we performed 132 THAs in our center. Thirty patients, 27 men and 3 women with an average age of 55.7 years were included for an outpatient surgery circuit. Three patients did not meet the inclusion criteria identified by the Anesthesiology Department. Of the 27 patients included in the program, 25 were discharged on the same day. Two patients were admitted: one due to an intraoperative fracture and the other due to poor pain control and dizziness. No secondary complications related to the program were observed after discharge. All patients except one would recommend the outpatient protocol.
Conclusions: OTHA programs should evolve from rapid recovery programs. Their implementation depends on an experienced multidisciplinary team. In this study, inclusion criteria were defined, achieving high satisfaction without increased complications. Outpatient surgery is a good option, and the implementation of this circuit is a safe, effective, and a satisfactory practice for selected patients.

DOI of original article: https://doi.org/10.1016/j.recot.2024.10.010
* Corresponding author.
E-mail address: Silmig007@hotmail.com (S.M. Miguela Alvarez).

https://doi.org/10.1016/j.recot.2025.06.011

PALABRAS CLAVE
Cadera;
Prótesis total cadera;
Artoplastia;
Ambulatoria;
Sin ingreso

Evolución del programa de recuperación rápida a cirugía ambulatoria en artroplastia total de cadera

Resumen
Introducción: La implementación de programas de Recuperación Acelerada (ERAS) ha cambiado la cirugía de prótesis total de cadera (PTC). La cirugía protésica ambulatoria se ha mostrado como una técnica segura y beneficiosa. Existen pocos centros en nuestro país que realicen cirugía de Prótesis Total de Cadera Ambulatoria (PTCA). Presentamos los resultados preliminares de nuestra experiencia.
Material y método: Estudio prospectivo observacional realizado el año 2023 con una muestra de 30 pacientes propuestos para PTC según un protocolo de cirugía ambulatoria por parte del Servicio de Cirugía Ortopédica y Traumatología (COT).
Resultados: En 2023 realizamos 132 PTC en nuestro centro. Se propuso a 30 pacientes el circuito de cirugía ambulatoria, 27 hombres y tres mujeres con edad media de 55,7 años. Tres pacientes no cumplieron los criterios de inclusión detectados por el Servicio de Anestesiología. De los 27 pacientes que incluimos en el programa, 25 fueron dados de alta el mismo día. Dos pacientes ingresaron: uno por sufrir una fractura intraoperatoria y el otro por mal control del dolor y mareo. En ningún caso se observaron complicaciones secundarias al programa tras el alta. Todos los pacientes excepto uno, recomendarían el protocolo ambulatorio.
Conclusiones: Los programas de PTCA deben ser una evolución de los programas de recuperación rápida. El poder realizarlos depende de un equipo multidisciplinar y con experiencia. En este estudio se han definido unos criterios de inclusión, consiguiendo una satisfacción alta sin aumento de complicaciones. La cirugía ambulatoria es una buena opción y la implantación de este circuito es una práctica segura, efectiva y satisfactoria en pacientes seleccionados.

Introduction

The implementation of *Enhanced Recovery After Surgery* (ERAS) programmes have transformed total hip replacement surgery. The enhancement of circuits thanks to preoperative optimisation, anaesthetic and pain management processes, as well as early rehabilitation, have made processes more efficient.[1] Fast Track circuits, Rapid Recovery, or ERAS2 programmes were introduced more than 20 years ago.[2] Many hospitals in Spain have these protocols in place for patients undergoing hip and knee prosthetic surgery.[3,4]

The implementation of these programmes has brought about shorter hospital stays.[5,6]

The Rapid Recovery protocol for total hip arthroplasty has been in operation at our centre since 2012 and has decreased the hospital stay from 7.6 days to 3.22 days over the course of three years. This multidisciplinary, dynamic approach has made it possible to gradually reduce the hospital stay from 3.22 days in 2015 to 1.3 days in 2023 (Figs. 1 and 2). This progression of the programme has enabled us to develop an outpatient total hip replacement (THRP) circuit in selected cases.

Outpatient prosthetic surgery has demonstrated that it is both safe and beneficial in a number of centres, providing clinical and economic benefits.[7,8]

At present, there are few centres that perform OTHA in the Spanish public healthcare system. We present the preliminary results of our experience.

Material and methods

Observational, prospective studied conducted during the year 2023 with 30 patients proposed for OTHA surgery by the Orthopaedic and Traumatological Surgery (OTS). All received information about the circuit (Fig. 3) and agreed to enter the program.

El rapid recovery circuit implemented in our centre begins by including the patient on the waiting list from those chosen for primary coxarthrosis. Having undergone the preoperative study, the Anaesthesiology Service assesses the anaesthetic-surgical risk using the *American Society of Anaesthesiology* (ASA) measure. Only ASA I and II individuals are accepted for, without anticoagulant therapy, and those that have a body mass index of less than 30.

All subjects eligible for prosthetic surgery enter into a blood-saving programme. Four groups are defined depending on the level of haemoglobin (Hb) and iron metabolism parameters. Group 0, Hb greater than 15 mg/dL; Group 1, Hb between 13 and 15 mg/dL; Group 2, Hb between 9 and 13 mg/dL; Group 3 A, Hb of between 9 and13 mg/dL categorised as iron deficient; Group 3 B between 9 and 13 mg/dL with altered iron metabolism. Those cases in which Hb values were less than 9 mg/dL are not accepted for surgery and, instead, are referred to the Haematology Service.

Only individuals categorized as Groups 0 and 1 are eligible for OTHA surgery.

Subjects pertaining to Group 0 do not receive any kind of optimisation treatment; those belonging to Groups 1 and

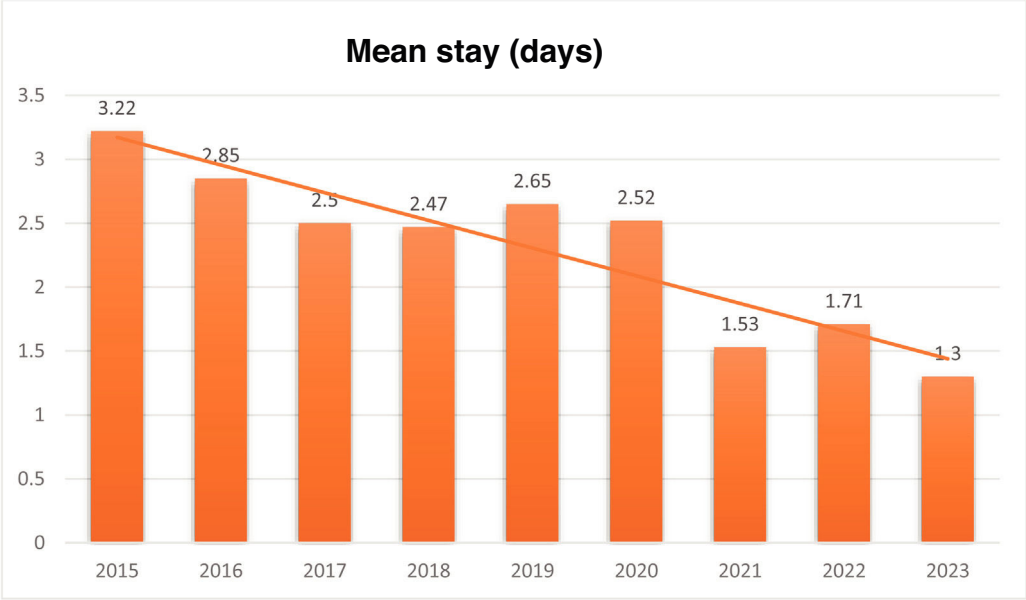

Figure 1 Evolution of the mean hospital stay following hip prosthetic surgery in our centre.

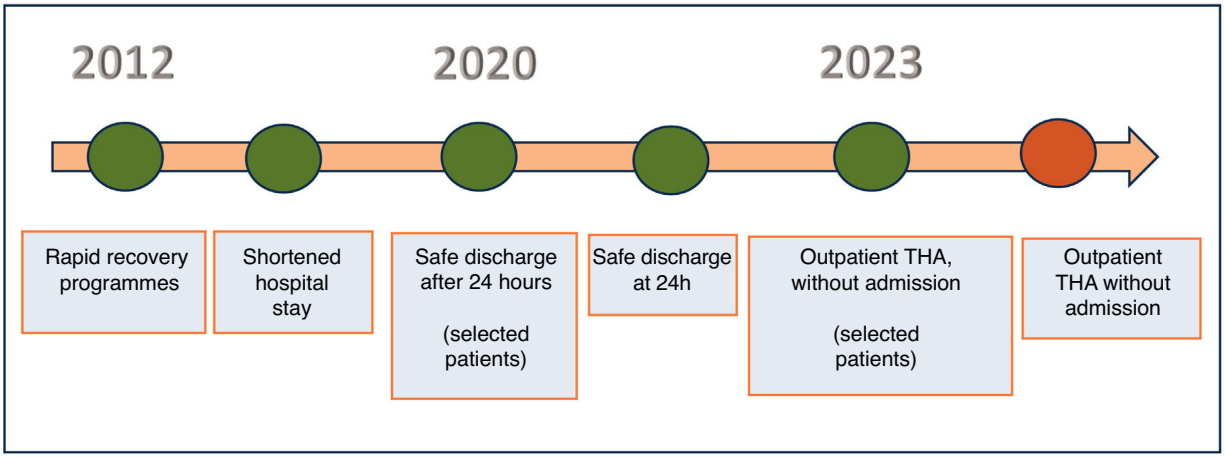

Figure 2 Evolution of rapid recovery programmes in hip prosthesis.

2 receive iron sucrose 200 mg every 14 days prior to their surgery; Group 3 A individuals receive two 1000-mg doses of iron carboxymaltose 21 days before the surgery. Group 3 B individuals are given the same treatment as those pertaining to Group 3 A in addition to four doses of 300,000 IU epoetin beta. All cases of individuals with Hb values of less than 13 mg/dL and mean corpuscular volume (MCV) in excess of 110 are treated with folic acid and vitamin B12.

The patients are then seen by the presurgical nurse. She explains the circuit to them and informs them about the presurgical skin hygiene measures.

Prior to the date of the surgery, patients receive a group educational class given by the Case Management Nurse (CMN) and physical therapist from the Rehabilitation Service where the information provided by the surgeon and anaesthesiologist is reinforced and greater detail given, and any questions regarding the process are cleared up.

All the interventions were performed by surgeons who are specialised in prosthetic surgery of the hip. The surgical approach was posterior in all cases and the prosthetic material implanted was the same model of prosthesis in all patients. Inasmuch as they were young patients, all the implants were cemented.

During the surgery itself, all subjects are given treatment with 15 mg/kg tranexamic acid, which is injected at the time of incision and the dose is repeated 3 h later. In those cases, in whom intravenous tranexamic acid is contraindicated, a dose of 2 g in 50 cm^3 SF is applied topically.

During the immediate postoperative period, 200 mg Fe iv was administered to all individuals who underwent arthroplasty.

Postoperative radiological control is performed prior to gaining access to the Outpatient Recovery Unit.

Patients begin with an oral diet 4 h after surgery and are assessed by the CMN who gets in touch with the team of physical therapists to commence with rehabilitation. The aim is for the person to begin walking with their pain under control using two forearm crutches, to be able to go up and

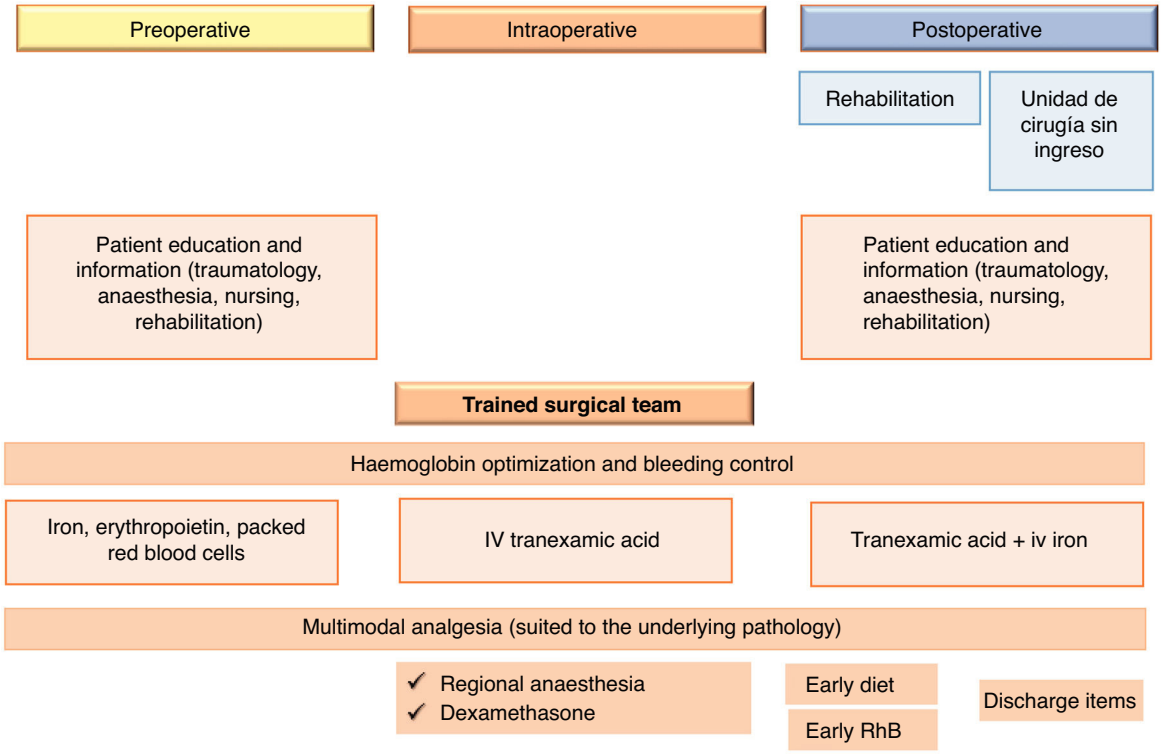

Figure 3 Outpatient hip replacement surgery circuit.

down stairs, as well as to be able to get into and out of bed. These objectives are included in the criteria for discharge.

A multimodal analgesia regimen is followed that includes preoperative preventive analgesia with 1 g of paracetamol and 200 mg of celecoxib *per os* 3 h before surgery. Fifty milligrams of dexketoprofen and 1 g paracetamol iv are administered intraoperatively, repeating the same regimen prior to discharging the person in the Outpatient Recovery Unit.

All participants received single dose of 16 mg of dexamethasone during surgery.

A bolus of 2 mg of intravenous morphine hydrochloride is administered as a rescue drug in the postoperative recovery service. For those individuals who are allergic to non-steroidal anti-inflammatory drugs (NSAID), 2 g of intravenous metamizole is substituted in place of dexketoprofen.

The analgesic regimen at home is comprised of celecoxib 200 mg/12 h and paracetamol 1 g *per os*. A 100-mg dose of tramadol retard is prescribed as rescue drug for at home use.

Postoperative pain was assessed using the visual analogue scale (VAS).

All the participants followed the regimen of enoxaparin for thromboembolic prophylaxis during the first month after surgery.

The criteria for discharge had to be met prior to being released (Fig. 4).

The first postoperative control was carried out 10 days after the surgery by wound care nursing at which point the initial bandage was changed.

All patients were asked about their satisfaction and if they would recommend the circuit on the basis of their own experience.

The study was conducted in compliance with all the ethical standards recognised in the Declaration of Helsinki and Resolution 008430 dated 1993 and had been approved by the Institutional Ethic Review Board.

Results

During the year 2023, a total of 132 total hip replacement surgeries were performed at our centre. Of them, 30 individuals were recommended for the outpatient surgery circuit; specifically, 27 men and three women with a mean age of 55.7 years.

Three patients who agreed to follow the outpatient program failed to meet the inclusion criteria because the Anaesthesiology Service had detected an issue in the preoperative assessment; the first one in light of a positive analysis of lupus anticoagulant and the others because of poorly controlled hight blood pressure.

Of the 27 subjects who were included in the program, 25 were discharged the same day as their surgery with good pain control and having satisfied the criteria for discharge. The other two individuals were admitted to the hospital (they did not follow the outpatient circuit and instead, followed the standard one); the first person because they had a surgical complication consisting of an intraoperative fracture of the trochanter, which was stabilised with two screws during the same surgery and the other. Subject because of poor pain control and dizziness (Fig. 5).

Postoperative pain was evaluated using the VAS. The mean score on the VAS the morning following surgery as recorded by phone was 3. Eleven subjects required the rescue drug during the first day at home.

	DISCHARGE	RE-ASSESS DISCHARGE
a. Pain under control at rest	Yes VAS: 0-3	No VAS: 4-10
a. Wound drain	No	Yes
a. Food tolerance	Yes	No
a. Mild pain when walking	Yes VAS: 0-3	No VAS: 4-10
a. Ability to walk approximately 50 metres	Yes	No
a. Ability to go up and down stairs	Yes (may require help)	No

Figure 4 Discharge criteria.

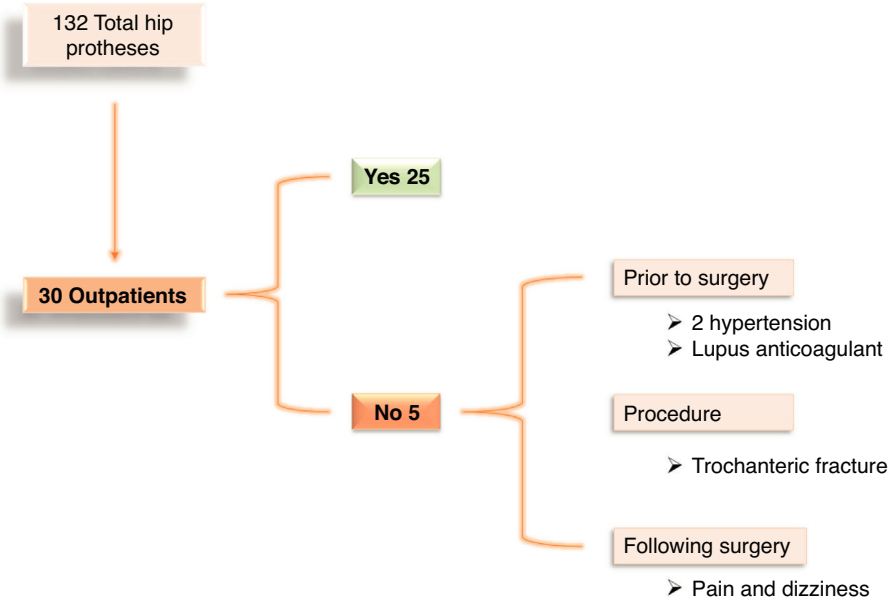

Figure 5 Summary of the path that patients undergoing outpatient total hip replacement surgery follow.

One patient went to the Emergency Service 10 days later because the wound drainage that required that the bandage be changed without subsequent recurrence.

All the participants were given a questionnaire about their satisfaction; the mean score was 9.4 out of 10 for the overall assessment of the programme (Fig. 6).

No complications secondary to the program were observed following discharge. One case was readmitted three weeks after the surgery with a dislocation after suffering a fall. A closed reduction of the dislocated hip was performed and there was no further repetition of the episode.

All of the patients except for one would recommend the outpatient protocol. The one who would not recommend it stated that it was because of poor pain control the first night.

Discussion

Our study covers 27 individuals who followed the OTHA surgery circuit without presenting any complications and with a high degree of satisfaction. In the literature in our country, there is bibliography regarding the implementa-

We are interested in finding out how satisfied people are who, like you, have used our hospital service. To that end, we have prepared this questionnaire in which we ask that you assess the services provided and how you have been treated by our staff. Your participation is both voluntary and anonymous.
To fill in this questionnaire, all you. Have to do is to put an X if the quality of the healthcare you received during your stay at the ***Internal Medicine service of the "Los Montalvos" Hospital*** was better or worse than you had expected base don the following scoring:

If the quality of the healthcare was:	Much worse than you had expected	Worse than you had expected	Better than you had expected	Much better than you had expected	Much better than you had expected
Mark	1	2	3	4	5

Example: if the staff's appearance (cleanliness and uniform) was better than you had expected, put an X in square number 4.

	1	2	3	4	5
	Much worse	Worse	As ex-pected	Better	Much better
The medical teams' diagnostic and treatment technology	1	2	3	4	5
Staff appearance (cleanliness and uniform)	1	2	3	4	5
Indications (signage) to get around and know where to go in the hospital	1	2	3	4	5
If the staff did what they said they would do	1	2	3	4	5
The state of the hospital rooms (whether they looked pleasant or not)	1	2	3	4	5
The information the physicians provided you with	1	2	3	4	5
How long you had to wait to be seen by a physician	1	2	3	4	5
How easy it was to get to the hospital	1	2	3	4	5
The interest the staff in solving patients' problems	1	2	3	4	5
Punctuality of the medical appointments	1	2	3	4	5
The speed with which you received what you needed or asked for	1	2	3	4	5
Staff's willingness to help you when you needed it	1	2	3	4	5
The confidence (safety) the staff conveys to the patients	1	2	3	4	5
How kind (polite) the staff were when dealing with people	1	2	3	4	5
Staff's preparation to carry out their work	1	2	3	4	5
How personalised patients were treated	1	2	3	4	5
Staff's ability to understand their patients' needs	1	2	3	4	5
The information physicians gave to relatives	1	2	3	4	5
The interest the nursing staff showed for their patients	1	2	3	4	5

Marque con una X la casilla que mejor refleje su opinión	Nada satisfecho	Poco satisfecho	Satisfecho	Muy Satisfecho
Indique su nivel de satisfacción global con los cuidados sanitarios que ha recibido durante su estancia en el hospital	❑	❑	❑	❑

Rev Calidad Asistencial. 2010;25:97–105

Figure 6 Satisfaction questionnaire.

tion and outcomes of the rapid recovery circuits in patients undergoing arthroplasty of both the knee and the hip[4,7]; however, none that refer to outpatients.

OTHA surgery evolved from the rapid recovery programme and should in no case be the initial aim of such programmes. The shortening of hospital stays to the point of outpatient prosthetic surgery is a development of at least 10 years of a programme implemented by the same team at the same institution.

All the individuals proposed for OTHA are informed about the circuit and are free to withdraw at any point during the process. No patient has asked to remain after meeting the criteria for discharge.

In this work, we regard the outpatient to be one who is discharged to their home the same day as the surgery, as defined in the article by Vehmeijer et al. in 2018.[9]

At present, outpatient prosthetic procedures have become a feasible option and are gradually being performed more and more. Experienced outpatient prosthetic surgery circuits have underscored the importance of meticulous patient selection, education, having family support, the use of multimodal analgesia, and the episode's ability to empower the patient, as well as the participation of the multidisciplinary team.[9]

We believe that the low rate of outpatient prosthetic surgery in our country in comparison with other countries has to do with our public healthcare system and the need for close-knit teams with expertise and great experience with rapid recovery programmes. The outpatient circuit is a process that saves costs as reflected in the many articles without detriment to patient safety,[10–12] although this is not the reason for implementing it. In our experience, what has driven its implementation has been the request of patients who had undergone THA surgery with a one-night hospital stay and who expressed their wish not to have to spend a night in the hospital for their surgery on the second side.

We observed no increase in complications following discharge or higher rate of readmissions in our first 27 cases with respect to those patients who were hospitalised, thereby corroborating the results of other authors with higher patient populations who define it as a safe procedure. Many of them emphasize the importance of patient selection,[13] while others point out that the risk of complications is unrelated to the presence of medical comorbidities,[6] which is why they do not apply inclusion criteria for such programmes.

The limitations of our study are the small sample size, given that we focused solely on patients discharged the same day as the surgery during the year 2023. We are continuing with the circuit during 2024 and as of May, 15 outpatients had undergone the surgery in this way, five more than the same time in 2023.

Conclusion

Outpatient total hip replacement surgery should be a logical continuation of rapid recovery programmes. The ability to carry them out or not depends on a multidisciplinary team with experience in ERAS programmes.

Inclusion criteria for patient selection have been defined for this first study, achieving a high degree of satisfaction without increasing the rate of complications.

Outpatient surgery is a good option and the implementation of this circuit is an effective and satisfactory practice in selected cases.

Level of evidence

Level of evidence III.

Ethical recommendations

The authors have taken into consideration the ethical responsibilities included in the rules regarding publication in this journal, including: they guarantee the patients' right to privacy and confidentiality as expressed in the corresponding section of these rules.

Funding

No economic aid has been received to fund this study.

Conflict of interests

The authors have no conflict of interests to declare that might have biased or impacted their actions or the outcomes of the study.

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