

# Total Hip Arthroplasty in An Orthopedic Institution in Cuba

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## Abstract

**Introduction:** Total, hip arthroplasty is a safe and effective procedure. It relieves pain, as well as improves physical health and quality of life in patients undergoing it.

**Purpose:** Study that allows to determine and show some characteristics of patients and the procedure, who underwent total hip arthroplasty in an important specialized institution in Cuba.

**Design:** Retrospective descriptive study with patients who underwent total hip arthroplasty in a hospital specializing in Orthopedics and Traumatology in Cuba; the "Fructuoso Rodríguez" Teaching Orthopedic Hospital, between September 2019 and March 2021.

**Results:** Predominance of the female sex between the ages of 60 and 62 with left laterality. The main preoperative diagnosis was coxarthrosis, the size of the acetabular cup and the head of the femoral component were very similar, with pressure fixation of the acetabular prosthesis. The posterolateral approach was used, in addition to the lateral, anterolateral and anterior approaches.

**Conclusions:** Great similarities were found in relation to the variables age, sex, laterality, size of the acetabular components and femoral head, type of fixation of the acetabular component and number of screws used in it. Only in three used an anterior approach to the hip.

**Keywords:** total hip arthroplasty; surgical approaches; anterior approach to the hip

## Introduction

Total, hip arthroplasty is considered a safe and effective procedure that provides clinically significant pain relief, as well as improvement in physical health and quality of life in patients with end-stage hip osteoarthritis [1,2]. Total, hip arthroplasty has been shown to improve pain, mobility and quality of life in patients with coxarthrosis [3]. but few studies are available in older age groups, particularly in those over 85 years of age.

It is estimated that more than 1 million hip arthroplasties are performed worldwide each year with a 10-year survival rate of 95% [4]. With the increase in life expectancy and the increase in the percentage of the elderly population, the demand for primary hip arthroplasty procedures by 2030 would grow by 174% [5]. Therefore, the number of older

patients requiring hip arthroplasty is expected to increase significantly in the near future.

Current data reported that people age 85 and older represent the fastest growing demographic group in the United States, projected to represent 2.3% of the US population in 2030 and 4.3% in 2050 [6,7]. In Switzerland, according to recent demographic data, the reported median life expectancy was 83.2 years in 2014, and by 2025 more than 20% of the total Swiss population would be over 65 [8]. Although patients older than 80 years could benefit significantly from elective hip arthroplasty [9,10], they represent a significant challenge for both the anesthesiologist and the arthroplasty surgeon, due to their limited physiologic reserves and increased postoperative complications compared with younger patients [11,12] Today, more often than ever,

the orthopedic surgeon is faced with the ethical dilemma of whether to operate on patients with debilitating hip osteoarthritis, who have already exceeded the average life expectancy, without inflicting more harm than good, and suffering an unnecessary use of resources [13].

The elderly population of developed countries has been increasing in recent decades due to the increase in life expectancy. According to the National Institute of Statistics, overall life expectancy is 83.19 years in Spain [14]. The group of 85 years or older, which represents more than 1.5 million people in Spain, has increased exponentially, coining terms such as “older-elderly” or “fourth age” [15,16]. An increasing number of patients aged 85 years or older will be candidates for total hip arthroplasty in the coming years due to the higher prevalence of hip osteoarthritis in the elderly population [17].

For years, age was considered a relative surgical contraindication, due to the greater medical comorbidity and the short life expectancy of elderly patients. However, the latest studies recommend not ruling out surgery just because of age, since the preoperative conditions of each patient must be assessed individually. In fact, some studies show that total hip arthroplasty in patients over 80 years of age has more benefits than in other younger age groups [17-20].

The increase in the elderly population coincides with a greater demand for total hip replacement. Despite the greater risk of the procedure in octogenarian patients, the overall rate of adverse effects is low, which is why total hip arthroplasty in this population is considered to be reliable in most cases [21,22]. Different early recovery protocols have proven to be effective even in patients older than 85 years, once the risks have been identified [23-25]. On the other hand, despite the fact that cemented total hip arthroplasty has shown excellent results, especially in elderly patients, the indication for non-cemented fixation continues to gain popularity in all age groups [26]. Another of the controversies that exist in this group of patients is the type of survival analysis that must be done to evaluate the results in populations with higher mortality [27-29].

The purpose of this work was to carry out a study that allows determining and showing some characteristics of the patients and the

procedure that underwent total hip arthroplasty in an important specialized institution in Cuba.

## Materials and Methods

### Methodological design

A retrospective descriptive study was developed with patients who underwent total hip arthroplasty at the hospital specialized in Orthopedics and Traumatology in Cuba; the "Fructuoso Rodríguez" Teaching Orthopedic Hospital, in the period between September 2019 and March 2021.

Data were obtained from the institution's medical records. The variables studied were: age, sex, laterality of the operated hip, preoperative diagnosis, type of surgical approach used, size of the acetabular component and the head of the femoral stem, and the type of adjustment used to fix the acetabular cup.

The universe of the study was all the patients operated on to perform total hip arthroplasty in the mentioned hospital center and in the established period of time.

The sample was made up of those patients who met the established criteria:

**Inclusion-** Patients whose clinical histories allowed the aforementioned study variables to be collected.

**Exclusion-** Patients with incomplete or illegible medical records that prevented data collection.

The variables were analyzed for their presentation in totals and average values with standard deviation to favor the presentation in tables and graphs.

## Results

In accordance with the declared purpose and design, the sample of this work consisted of 74 patients with 80 operated hips (six bilateral arthroplasties); with a mean age of  $60.3 \pm 14.6$  years, female predominance and very similar laterality between the left and right hip. All of the above is visible in Table 1 referring to the demographic variables.

**Table 1:** Demographic variables

Variable	"Fructuoso Rodríguez"			
	Total	Estatísticas/ category	SD/ No	%
<b>Age</b>	74	Half/SD	$60,3 \pm 14,6$	-
<b>Sex</b>		Número/%		
Male	74		32	43,2
Female	80		42	56,8
<b>Laterality</b>		Número/%		
Left			41	51,2
Right			39	48,8

**Source:** Clinical History.

**Reading:** No- number of patients; SD- Standard deviation.

We wanted to determine the diagnostics of the intervened hips (N=80) that forced the surgical procedure of total hip arthroplasty, where it was found that the diagnosis of coxarthrosis was the predominant one

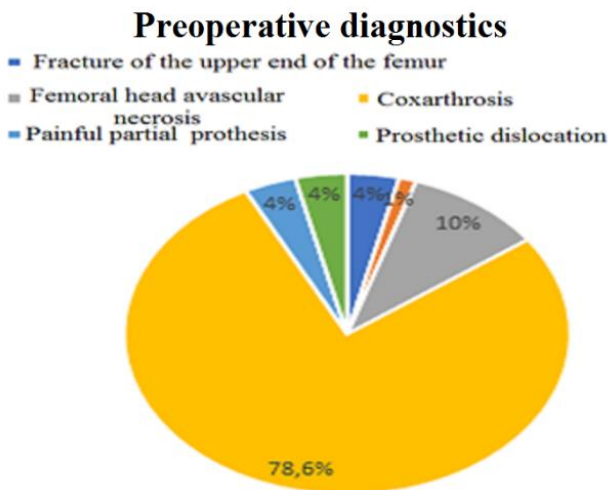
with 63 hips of the 80 intervened (78.6%), followed by avascular necrosis of the femoral head with eight hips (10.0%). The remaining diagnostics showed very similar results, all of which is visible in Table 2.

**Table 2:** Preoperative diagnoses

Diagnostics	"Fructuoso Rodríguez"	
	Number	%
Fracture of the upper end of the femur	3	3.8
Femoral head avascular necrosis	8	10.0
Coxarthrosis	63	78.6
Prosthetic dislocation	3	3.8
Painful partial prosthesis	3	3.8
<b>Total</b>	<b>80</b>	<b>100.0</b>

Source: Clinical History.

Graph 1 allows an easier understanding of the incidence of preoperative diagnoses found in the "Fructuoso Rodríguez" Teaching Orthopedic Hospital.



**Graph 1:** Preoperative diagnostics at the "Fructuoso Rodríguez" Teaching Orthopedic Hospital.

Another variable declared in the design and considered very important for this study is to describe the surgical approach used to perform the total hip arthroplasty procedure. In "Fructuoso Rodríguez" four surgical approaches were used with a great predominance of the posterolateral approach (73.8% of the hips), followed by the lateral

approach (12.5%). It is noteworthy that only three arthroplasties out of the total number of those performed were performed by an anterior approach (two in a patient who underwent bilateral hip arthroplasty and the other by a non-Cuban surgeon), as shown in Table 3.

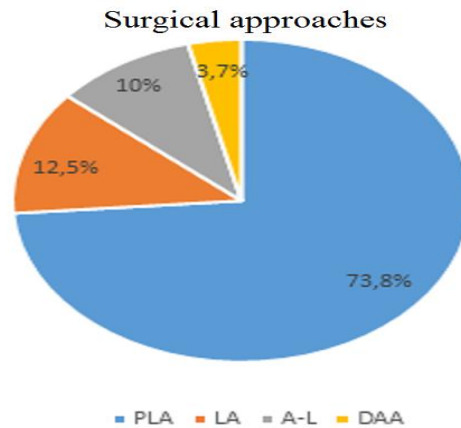
**Table 3:** Surgical approach used to perform total hip arthroplasty.

Approach	"Fructuoso Rodríguez"	
	Frequency	%
PLA	59	73.8
LA	10	12.5
A-L	8	10.0
Anterior	3	3.7
<b>Total</b>	<b>80</b>	<b>100.0</b>

Source: Clinical History.

Reading: PLA- Posterolateral approach; LA- Lateral approach; A-L- Anterolateral approach.

Graph 2 was elaborated to make even more visible the relationship of surgical approaches used in this center specialized in Orthopedics and Traumatology that we present.



**Reading:** PLA- Posterolateral approach; LA- Lateral approach; A-L- Anterolateral approach

**Graph 2:** Surgical approaches used at the "Fructuoso Rodríguez" Teaching Orthopedic Hospital.

Table 4 shows the technical details related to what was found regarding the size of the acetabular components and femoral head, as well as the type of adjustment of the acetabular component and the number of screws used when adjustment was made using these. All this collected in the reviewed medical records.

**Table 4:** Variables related to the prosthesis.

Variables	"Fructuoso Rodríguez"		
	Statistics/ Category	SD/ Number	%
<b>Acetabular component size (mm)</b>	Half/SD	50.8 ± 3.7	-
<b>Femoral Head Component Size (mm)</b>	Half/SD	29.3 ± 2.4	-
<b>Acetabular Component Fit Type</b>	Half/SD		
by pressure	No/%	63	78.7
by screws	No/%	17	21.3
<b>Number of screws</b>	Half/SD	1.7 ± 0.5	-

**Source:** Clinical History.

**Reading:** No- number of patients; SD- Standard deviation.

**Discussion**

Severe osteoarthritis of the hip is one of the main causes of disabling pain, functional impairment, and decreased quality of life in the older adult population [19,30]. Total, hip arthroplasty is a highly successful surgery in the treatment of symptomatic osteoarthritis in terms of pain relief, restoration of function, and improvement of quality of life. Due to changing world population demographics, the number of older people undergoing hip arthroplasty for osteoarthritis and other causes such as avascular necrosis of the femoral head is increasing. With the reported increased rates of mortality and complications from major surgery in the geriatric population, the orthopedic surgeon must face an ethical dilemma as to whether to operate on patients with debilitating hip osteoarthritis, who have already exceeded the average life expectancy. However, the benefits of hip arthroplasty are well documented in the literature.

As in this study, most of the publications reflect a majority percentage of women (range 60.29-74.40%) [31], which in this review resulted in a close relationship between women and men in the hospital studied (although with a predominance of women) and an age greater than 60

years in this group. However, some studies report a predominance of right hips, for example, the Finnish registry by Ogino et al. (57.6%) [31], which does not coincide with what was found in this work, since a slight predominance of the left hips was found.

As in most of the studies reviewed [29-31], hip osteoarthritis was the main diagnosis that led to the decision to perform surgical treatment by placing a total hip prosthesis. It should be noted that only in three hips the diagnosis was prosthetic dislocation; In another three hips, total hip arthroplasty was performed due to a history of painful partial prosthesis.

A good exposure of the hip favors the implementation of the prosthesis; however, as exposure of the bony structure of the joint increases, damage to the soft tissues around the hip is also aggravated, resulting in excessive intraoperative bleeding, muscle weakness around the hip, increased postoperative complications, decreased prosthetic stability. How to minimize soft tissue damage while ensuring good exposure is an issue that must be considered in hip arthroplasty. The direct anterior approach exposes the hip through the space between the tensor fascia latae and the sartorius muscle, without

sacrificing the musculatures around the hip, with relatively little damage to the soft tissues; The structural integrity of the hip abductor muscles is preserved, which improves the stability of the prosthesis and allows the patient to mobilize earlier, therefore, it is beneficial for early recovery [32,33].

As can be seen in the results of this work, the posterolateral, lateral, antero-lateral and anterior surgical approaches were used, although there was a wide predominance of the posterolateral approach performed in 59 hips out of the 80 operated on. The most significant thing was that in 80 hips operated on to perform total hip arthroplasty, only three of them used the anterior approach, according to the data collected, by foreign surgeons, which is striking because currently this approach has It has gained many followers, and publications related to it predominate in specialized magazines.

When comparing the size of the acetabular component and the component of the femoral head in the group, it is observed that the size of the prosthesis was found in similar mean values, with a wide predominance of acetabular prostheses fixed by "pressure" (78.7%), as well as the number of screws used in the few hips in which this fixation was completed through screws.

### Conclusion

In this descriptive-retrospective study, great similarities were found with what was published in relation to the variables age, sex, laterality, size of the acetabular components and femoral head, type of fixation of the acetabular component, and number of screws used in it. There were small differences in relation to the preoperative diagnosis, although with a frank predominance of hip osteoarthritis. Only in three hips was an anterior approach to the hip used

### Conflict of interest:

The authors declare that they have no conflicts.

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DrC. Horacio Tabares Neyra- He planned the research and wrote the paper.

Dr. Tiemur Wu- Performed the data collection.

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