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Role and Indications of Primary Total Hip Arthroplasty at the Cheikh Ahmadoul Khadim National Hospital Center of Touba

Alioune Badara Dione[1*], Chérif Sadibou Djiba[1], Mamadou Lamine Diagne[1], Badara Dembélé[2], Ndiaga Dieye[2], Charles Bertin Diémé[2]

[1]Department of Orthopedic and Trauma Surgery, Cheikh Ahmadoul Khadim Hospital, Touba, Senegal
[2]Department of Surgery and Surgical Specialties, University Cheikh Anta Diop, Dakar, Senegal
Email: *aliounebadaradione1@gmail.com

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Abstract

This retrospective descriptive study reports the activity and indications for primary total hip arthroplasty (THA) over a 20-month period in a newly established non-university hospital in Touba, Senegal. Among the 70 primary THAs included, femoral neck fractures and primary osteoarthritis were the main indications, with traumatic etiologies and their sequelae accounting for more than half of the cases. The authors believe that decentralized THA management is feasible with appropriate staff, infrastructure, and implants.

Keywords

Total Hip Arthroplasty, Touba, Senegal

1. Introduction

Total hip arthroplasty is a surgical procedure to replace a diseased hip joint with a mechanical prosthesis; the goal is to restore the joint's functional integrity. It is called primary or first-line surgery when it is performed for the first time. Revision surgery is the replacement of all or part of a primary arthroplasty due to complications.

In developed countries, primary total hip arthroplasty is one of the most common procedures [1] [2]. In 2007, it was considered the surgery of the 20th century due to the large number of hip replacements performed and the significant and notable improvement in the quality of life of the patients who underwent it [3].

In sub-Saharan African regions, with the exception of South Africa, this surgery is not common [4] despite the increase and improvement of hospital infrastruc-

ture [5]. In Senegal, it began tentatively in the capital, Dakar, at the University Hospital Center (CHU) in 1980 [6] and remains largely performed in that city. This study was conducted in Touba, a city located 200 km from the capital. Its objective was to determine the role of primary total hip arthroplasty and its indications.

2. Patients and Methods

This was a descriptive, retrospective, observational, cross-sectional study conducted over a 20-month period (September 19, 2022 - April 5, 2024) in the orthopedics and traumatology department of the Touba University Hospital. This is a new hospital facility that began operations in May 2022.

The department has a local medical and paramedical team, including two orthopedic surgeons, 12 inpatient beds, and an operating room exclusively dedicated to aseptic surgery of the musculoskeletal system.

All patients who underwent total hip arthroplasty were included in the study. Patients who underwent revision total hip arthroplasty were excluded. The prostheses used were uncemented with a polyethylene-metal bearing surface. The surgical approach was posterolateral. A total of 70 patients were identified. The mean age was 53 years, ranging from 18 to 81 years, distributed as follows:

- 18 - 24 years: 3 patients
- 25 - 44 years: 19 patients
- 45 - 64 years: 28 patients
- 65 years and older: 20 patients

There were 38 female and 32 male patients, for a sex ratio of 0.84. The majority of patients resided in the Touba region and its immediate surroundings (81.42%).

In terms of employment, 75% worked in the informal sector without any health insurance.

Comorbidities were observed in 23 patients (27.14%), including 9 cases of hypertension, 9 cases of sickle cell disease, and 5 cases of diabetes.

The role of primary total hip arthroplasty was determined by considering the total number of surgical procedures performed in the orthopedic trauma department and those involving the femoroacetabular joint.

Indications were determined based on clinical and Para clinical data from patient records: medical history, physical examination, medical imaging, and laboratory results. These indications were correlated with or related to age, sex, gait status prior to surgery, and any observed comorbidities.

3. Results

1) Role of Total Hip Arthroplasty

During the study period, 655 surgical procedures were performed in the orthopedic and traumatology department, 122 of which involved the hip joint. **Table 1** shows the role of primary total hip arthroplasty.

Primary THAs account for 57.3% of hip surgeries.

Table 1. Role of primary total hip arthroplasty.

Intervention	Number	Percentage (%)
Surgical interventions in the department	655	—
Hip surgeries	122	18.63
Total Hip Arthroplasty (THA)	75	11.45
Primary THAs	70	10.69
Secondary THAs	5	0.76

2) Indications

Table 2 shows the different indications for arthroplasty.

Table 2. Different indications for arthroplasty.

Indication	Number	Percentage (%)
Femoral neck fractures	31	44.2
Primary coxarthrosis	21	30
Femoral head osteomyelitis	9	12.8
Femoral neck nonunion	6	8.5
Femoral neck tumor	2	2.8
Post-traumatic coxarthrosis	1	1.4
Total	**70**	**100**

Overall, traumatic causes and their sequelae were observed in 38 patients (54.2%).

Post-traumatic coxarthrosis was secondary to a hip fracture-dislocation.

Table 3 shows the indications for arthroplasty correlated with age groups.

Table 3. Indications for arthroplasty correlated with age groups.

Indication	Age 18 - 24	Age 25 - 44	Age 45 - 65	Age > 65	Total
Femoral neck fractures	0 (0%)	1 (3.1%)	19 (59.4%)	12 (37.5%)	31
Primary coxarthrosis	2 (9.5%)	5 (23.8%)	10 (47.6%)	4 (19.0%)	21
Femoral head osteonecrosis	1 (11.1%)	5 (55.6%)	2 (22.2%)	1 (11.1%)	9
Femoral neck nonunion	0 (0%)	0 (0%)	2 (33.3%)	4 (66.7%)	6
Femoral neck tumor	0 (0%)	2 (100%)	0 (0%)	0 (0%)	2
Post-traumatic coxarthrosis	0 (0%)	0 (0%)	1 (100%)	0 (0%)	1
Total	3	13	34	21	70

The average age for the femoral neck fracture was 60.9 years; 47.3 years for the coxarthrosis; 39 years for the osteonecrosis of the femoral head; 66.3 years for the pseudarthrosis of the femoral neck and 30.5 years for the 2 tumors.

Table 4 represents the indications reported by gender.

Table 5 represents the indications correlated with the observed comorbidities.

Table 6 represents the indications reported to the status of walking before surgery.

Table 4. Indications reported by gender.

Indication	Sex	Number	Percentage (%)
Femoral neck fracture	M	14	20.0
Femoral neck fracture	F	17	24.2
Primary coxarthrosis	M	8	11.4
Primary coxarthrosis	F	13	18.5
Femoral head osteonecrosis	M	5	7.1
Femoral head osteonecrosis	F	4	5.7
Femoral neck nonunion	M	3	4.2
Femoral neck nonunion	F	3	4.2
Femoral neck tumor	M	1	1.4
Femoral neck tumor	F	1	1.4
Post-traumatic coxarthrosis	M	1	1.4
Total M	—	**32**	**45.7**
Total F	—	**38**	**54.3**
Total	—	**70**	**100**

Table 5. The indications correlated with the observed comorbidities.

Indications	Comorbidities	Number
Femoral neck fracture	High blood pressure	9
	Diabete	5
Femoral head osteonecrosis	sickle cell disease	9

Table 6. The indications reported to the status of walking before surgery.

Indication	Preoperative Walking Status	Number	Percentage (%)
Femoral neck fracture	Independent walking	31	44.3
Primary coxarthrosis	Limping while walking	19	27.1
Femoral head osteonecrosis	Limping while walking	9	12.9
Femoral neck nonunion	Limping while walking	6	8.6
Femoral neck tumor	Limping while walking	2	2.9
Post-traumatic coxarthrosis	Limping while walking	1	1.4
Total	—	70	100

4. Discussion

Apart from South Africa, total hip arthroplasty (THA) is not a sustained and widespread practice in other countries of the continent [4] [7] [8]. Yet the indications exist: primary or secondary osteoarthritis of the hip, osteonecrosis of the femoral head, femoral neck fractures, and traumatic or infectious sequelae of the hip joint [9] [10]. This situation is explained by the high cost of this surgical procedure, particularly the prosthetic implant, the frequent shortage of qualified personnel, and the lack of suitable technical facilities. Added to this is the almost complete absence of health insurance systems that could cover the financial burden of this type of surgery [11]. Furthermore, THA is most often performed in university hospitals in major urban centers, sometimes in partnership with surgical teams from European or American countries. All these considerations help explain the scarcity of publications on THA in sub-Saharan Africa. The series are generally short; when they reach the hundred cases it is over fairly long study periods [12]-[23].

Our study is distinguished by two particular features. The first shows that the total hip replacement (THR) was performed in a non-university hospital outside the capital. The second describes a number of cases approaching one hundred in twenty months of operation, ranking first among hip surgeries, despite the department ranking only tenth in surgical procedures. The hospital's recent opening cannot alone explain these results. The presence of a competent local team (orthopedic surgeons, anesthesiologists, nurses, physiotherapists) and an operating room with complete basic instrumentation dedicated exclusively to musculoskeletal surgery are factors to consider. The other point to emphasize is the current continuous availability of prosthetic implants in Senegal.

In this series, the indications were dominated by trauma, with femoral neck fracture and its progressive complication, nonunion, being the most common. The nonunion resulted from traditional medicine treatment of the fracture. This practice is very frequent in Africa [24]. Epidemiologically, the classic data for a femoral neck fracture are observed: a female predominance, primarily affecting patients aged 60 and over. Femoral neck fractures are becoming increasingly common among the elderly in Africa, with a marked increase in frequency [25]. The choice of total hip arthroplasty (THA) was guided by the low presence of comorbidities and the notable absence of impaired walking ability prior to the fracture. Furthermore, another economic factor facilitated the choice. In Senegal, patients aged 60 and over are exempt from medical expenses, except for prosthesis components, through a health insurance system called the Sesame Plan [26]. In the case of coxarthrosis, it was primary in the majority of cases.

It is the second most common indication. These are lesions observed in young patients at a very advanced stage, with significant functional impairment due to delayed treatment. This delay is due to the exorbitant cost of surgery in patients who are often impoverished and lack any social assistance. The consequence is a difficult total hip replacement (THR). In the vast majority of African publications,

coxarthrosis followed by osteonecrosis of the femoral head is the first-line treatment, according to Davies' meta-analysis [4], unlike our study. However, they share the same characteristics in terms of age and lesion stage. In our patients, osteonecrosis is linked to sickle cell disease type SS. This is a monogenic, autosomal recessive, multisystemic disease characterized by the presence of abnormal hemoglobin (HbS), caused by a single mutation in the beta-globin gene. It is very common in Africa [27]. Among its osteoarticular complications, osteonecrosis of the femoral head is most often encountered on the continent at an advanced stage requiring treatment with a total hip arthroplasty [28].

Total hip arthroplasty (THA) is becoming a reality in sub-Saharan Africa. It is already important to establish national registries to record this joint replacement surgery [4] [7] [29] [30]. This will help address the need for revision surgery, often due to the young age of the patients and implant wear over time.

5. Conclusion

Total hip arthroplasty presents a therapeutic challenge in Africa. Its indications exist and are varied. It can be performed in any hospital. However, it is demanding in terms of equipment, qualified personnel, and accessibility through the establishment of a health insurance system. All these conditions should allow for continuous and controlled activity.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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