

Total Hip Arthroplasty in a Developing Country: Epidemiological, Clinical and Etiological Aspects and Indications

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Abstract: *Background:* Total hip arthroplasty is a prosthetic joint replacement procedure. Its indications remain dominated by hip osteoarthritis. *Objective:* to describe the epidemiological, clinical and etiological aspects of total hip arthroplasty and its indications in a developing country. *Patients and Methods:* The work was a descriptive study with retrospective data collection over a six year period from January 1st 2010 to December 31st 2015. It was carried out in the general surgery department of Tanguieta district hospital in Northern Benin. Were included all the patients who received a total hip prosthesis during the study period. *Results:* Two hundred and forty-five patients including 129 men (52.7%) and 116 women (47.3%) were registered. The average age of the patients was 41 ± 13.7 years with extremes of 17 and 80 years. Thirty patients (12.2%) had bilateral total hip prosthesis. The first three indications were osteoarthritis, osteonecrosis of the femoral head due to sickle-cell disease and pseudarthrose of the femoral neck. *Conclusion:* Total hip prosthesis at Tanguieta district hospital interests young people. Osteoarthritis and necrosis of the femoral head were the most frequent indications.

Keywords: Total Hip Arthroplasty, Youth, Osteoarthritis, Sickle-Cell Disease

1. Introduction

Total hip arthroplasty (THA) is a reconstructive procedure that consists of surgical replacement of the hip joint with an artificial prosthesis. THA is one of the most widely practiced orthopedic operations in the world and is continuously increasing in industrialized countries [1, 2]. The most important indication of THA remains hip osteoarthritis, which is a chronic joint disease characterized by structural deterioration of the articular cartilage. The other indications are mainly post-traumatic arthritis, more common in elderly people, especially in women under 80 years [2, 3]. This last indication limited the practice of this technique to the elderly. The excellent results of this technique have prompted

orthopedic surgeons to practice it more and more in young people [4]. The objective of this work was to describe the epidemiological and clinical aspects of THA patients and to identify the different pathologies requiring THA.

2. Patients and Methods

This was a descriptive study with retrospective data collection over a six-year period from 1st January 2010 to 31st December 2015. It was carried out in the general surgery department of Tanguieta district hospital which is located in the north of Benin. Were included all patients operated for primary THA and whose medical record was complete. The epidemiological, clinical and etiological variables and indications were studied. Postel Merle d'Aubigné (PMA) [5] score was used for the assessment of hip

function. It is a clinical rating scale that studies pain, mobility and walking with items from 1 to 6. It is appreciated as follows: 18 = Excellent, 17 = Very good, 16 or 15 = Good, 14 or 13 = Fair, 12 to 10 = Mediocre, ≤ 9 Bad. The data collected were analyzed with Epi Info 7. The quantitative variables were expressed by their mean followed by the standard deviation. Frequencies in the form of proportions were used to describe qualitative variables.

3. Results

3.1. Epidemiological Data

During the study period, 13,096 surgical procedures, including 5,126 in traumatology, were performed. From 27 THA poses in 2010, the number increased each year and reached 64 in 2015. A total of 275 hip replacements were performed for 245 patients as 30 patients (12.2%) had bilateral prostheses. Thus, the frequency of THA placement was 2.1% and this surgery accounted for 5.4% of the trauma surgery.

The mean age of the patients was 41 ± 13.7 years with

extremes of 17 and 80 years. Patients aged 20 to 40 years accounted for 47.4% of the study population. There were 129 men (52.7%) and 116 women (47.3%) so a sex ratio of 1.1. Public servants were the most represented with a percentage of 29.8% (73/245 cases). As for the geographical origin of the patients, 159 came from Benin (64.9%), 59 from Burkina Faso (24.1%), 20 from Togo (8.2%) and 7 from other countries in the subregion (2.8%).

3.2. Clinical Information

The mean time of consultation was 6.1 ± 6.1 years with extremes of 1 day and 35 years. The main reason for consultation was pain in all patients. This pain was associated with lameness and functional impotence respectively in 84 cases (30.5%) and 12 cases (4.4%). Of the 245 patients, 78 (31.8%) had a pathological medical history. That was mostly sickle cell anemia found in 47 patients (19.2%), namely 36 heterozygous (SC) and 11 homozygous (SS). Pathological surgical history was noted in 34 patients (13.9%), of whom 29 (11.8%) were traumatic. Table 1 shows the distribution of surgical history.

Table 1. Distribution of PTH patients according to pathological surgical history.

	No of cases	Percentage
Posttraumatic		
Fracture of the femoral neck	9	26,5
Traumatic hip dislocation (THD)	8	23,5
Fracture of the acetabulum	4	11,8
Trochanteric Fracture	3	8,8
Fracture of femoral neck associated with THD	2	5,9
Fracture of the acetabulum associated with THD	2	5,9
Fracture of the acetabulum and femoral neck	1	2,9
Non-traumatic		
Coxarthrite	2	5,9
Congenital malformation	2	5,9
Congenital dislocation	1	2,9
Total	34	100

The functional activity of the limb was disrupted in all cases. It was decreased in 188 cases so 68.4% (188/275 cases) and impossible in 87 cases, so 31.6% (87/275). The preoperative PMA score was mediocre in 75 cases (27.3%) and bad in 200 cases (72.7%). The average value was 7.9 ± 1.6 with extremes of 4 and 11. The muscular atrophy of the quadriceps and the shortening of the limb were found respectively in 102 limbs (37.1%) and 125 limbs (45.4%).

3.3. Etiological Data

No etiology was identified in 67.3% of cases (165/245 patients). The two causes identified were sickle cell anemia

and trauma with 19.2% (47/245 patients) and 12.2% (30/245 patients) respectively. The traumatic causes were found mainly in the male people at 93.3% (28/30 cases).

3.4. Indications

Hip osteoarthritis was the major indication of THA with a percentage of 48.4% (133/275 cases). Then follows osteonecrosis of the femoral head that was observed in 74 patients of which 12 cases of bilaterality representing 31.3% (86/275 cases). Table 2 shows the distribution of THA patients according to indications and Figures 1 and 2, some illustrative X-ray images.

Table 2. Distribution of PTH patients according to indications.

	No of cases	Percentage
Osteoarthritis (OA)	133	48,4
Osteonecrosis of the femoral head	86	31,3
Post-traumatic arthritis	20	7,3
Neglected hip dislocation	18	6,5
Pseudarthrosis of the femoral neck	13	4,7
Fracture of the femoral neck	3	1,1
Sequelae of a first-time treatment of femoral fracture	2	0,7
Total	275	100

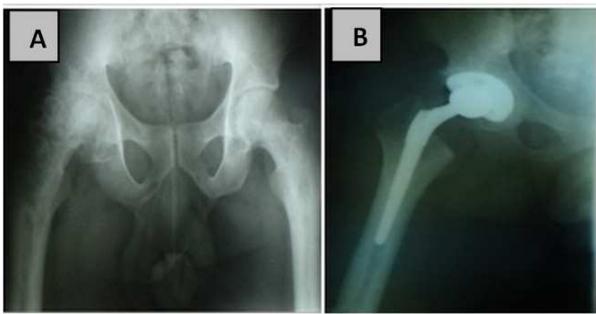


Figure 1. A 35-year-old man with right hip osteoarthritis B X-ray after THA with non-cemented components.

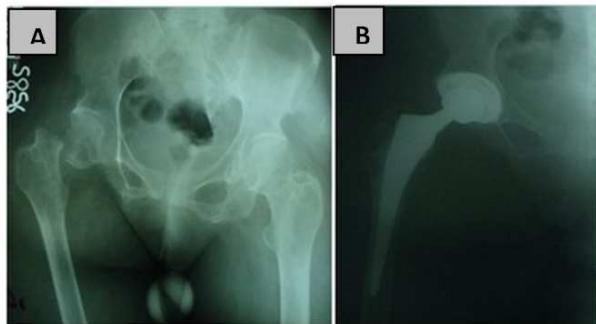


Figure 2. A 55-year-old woman with pseudarthrosis of the right femoral neck B X-ray after THA with non-cemented components.

4. Discussion

4.1. Epidemiological Data

The introduction of THA is increasingly common in industrialized countries, which is the case in our country. THA poses at Tanguieta district hospital increased from 27 cases in 2010 to 64 in 2015. It concerned civil servants who were the best informed and could pay for their care. The hospital frequency of THA placement was 2.1%. It is similar to the 2.04% found in France in 1992 [6].

The mean age of our patients was 41 years. This average age could be explained by several factors: the young age of the African black people, the complications of sickle-cell anemia occurring at a young age, the sequelae of arthritis not treated or badly treated in childhood and trauma hip in young people. A study in Cotonou (Benin) in 2010 reported a similar average age of 44 years [7]. In North Africa, the mean age was 46 years at Oujda University Hospital Center [8] and 56.5 years in Marrakech, Morocco [9]. The same holds true in Asia where the average age of 55 is raised [10]. On the contrary, in the West, some studies [2, 11] reported higher average around 70 years, explaining that THA is essentially indicated for treatment of hip osteoarthritis in their series.

We did not observe a predominance of sex. The sex ratio was 1.1. While some authors [12, 13, 14] mention a classic female predominance among THA candidates, others especially in North Africa [8, 9] reported a male predominance with sex ratios of 1.45 and 1.63.

4.2. Clinical Information

The average time for consultation was 6.1 years. This long duration could be explained by the ignorance of the patients, the trivialization of the symptoms, but especially the slow and progressive character of the hip articular degradation. Only one patient had consulted the same day after a fracture of the femoral neck.

The preoperative PMA score was mediocre and bad in 27.3% and 72.7% of cases respectively. In Tunisia in 2015 [15], 60% of patients had a bad preoperative PMA score and 40% a fair functional score.

The amyotrophy of the quadriceps was noted in 37.1% of cases and the shortening in 45.4%. Several authors had made similar observations. In 2009 in Mali [16] the amyotrophy of the quadriceps was found in 62.5% of cases and the shortening in 87.5%. These two signs were present in all patients in the series of Chagou A et al. in Morocco [17].

4.3. Etiological Data

No etiology was found in 67.3% of the cases as Ameziane et al. [18] who reported a rate of 83%. This would mean that the majority of hip arthritis appeared to be primitive. Nevertheless, sickle-cell anemia was found in 19.2% of our patients. Traumatic causes were identified in males in 93.3%. These traumas are often the result of traffic accidents that are more encountered in men.

4.4. Indications

Hip osteoarthritis was the first indication of THA in our study with 48.4%. In other studies [12, 19, 20], this primary coxarthrosis was also found, but with higher rates of 70-73.2%. Necrosis of the femoral head was in second position in our study with 31.2% of cases. In the series of the SoFCOT [11] it was in third position with 5.3%. This discrepancy could be explained by the fact that hemoglobinopathies are rare or even non-existent in these countries.

The number of implanted THA for post-traumatic arthritis was 7.3% in our series which is similar to the 6.9% found in a series in Asia [10] but clearly above the 2.5% found in France [20]. This difference can be explained by the fact that traumatic pathologies are quickly taken care of in Western countries and evolve very little towards arthritis. In our context, patients resort to traditional first-line treatment and come to hospital late with complications.

THA may be indicated in recent femoral neck fractures [20, 21]. We report a single case that corresponds to 0.4% of cases. This rate was 4.7% in the French register of THA [20], 7.4% in Athens in Greece [22] and 10% in an Asian study [23].

5. Conclusion

Total hip arthroplasty at Tanguieta district hospital mainly

concerns young people. The time of consultation was long and the main reason was pain. Osteoarthritis and osteonecrosis of the femoral head due to sickle-cell anemia were the most frequent indications. So the fight against sickle cell anemia would reduce the number of THA.

Declaration of Conflicts of Interest

The authors declare that they have no competing interests.

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