

Total Hip Replacement: Short- and Medium-Term Morbidity and Mortality in the Department of Orthopedic Traumatology of Donka University Hospital, Guinea-Conakry

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Abstract

Introduction: Total hip prostheses are a reliable means of treating hip disorders. It is indicated when pain and reduced mobility of the hip become incompatible with the patient's daily activities. In low-income countries, the risk factors for hip disease are numerous, but the means for its management, such as total hip prostheses, are not. The aim of this work was to determine the morbi-mortality of total hip prostheses in the short and medium term in our department and to review the literature. **Patients and Method:** This was a prospective and descriptive study over a period of 9 years. It involved 50 THPs performed on 45 patients. Patients who had received a THP and were followed up for at least two years were included. We excluded patients who were lost to follow-up. The Moore-type posterolateral minimally invasive approach was used. Complications were investigated from the immediate postoperative period and in the medium term. The final functional results were evaluated according to the Postel Merle d'Aubigné score. **Results:** We performed 50 THPs out of 750 procedures, *i.e.*, 6.6%. The indications were: primary coxarthrosis 60%, necrosis of the femoral head 26%, post-infectious balloon hip 4%, and pseudarthrosis of the femoral neck 10%. The average time to the consultation was 2.4 years with extremes of 1 and 5 years. According to the terrain, sickle cell disease represented 18%, tuberculosis 12%. Postoperative complications were lameness 12%, dislocation 6%, suppuration 6%, death 4%, peri-prosthetic fracture 8%, loosening 2%, peri-articular ossi-

fication 2%, and paralysis of the external popliteal nerve 2%. **Conclusion:** Whoever performs a THP is obliged to monitor the patient as long as he/she is alive. Complications are possible at any time and can negatively change the assigned goal and force the surgeon to be expensive and sometimes inconclusive secondary interventions.

Keywords

THP, Morbi-Mortality, Short-, Medium-, Term

1. Introduction

The total hip prosthesis is a reliable means in the treatment of hip disorders [1].

It is one of the most commonly performed orthopedic operations in the world.

The most common indications are primary and secondary coxarthrosis [2].

In the United States, the number of total hip replacements is estimated to grow by 147% and total knee replacements by 673% by 2030 [3].

According to Cerboni S [4], approximately 40,000 total hip replacements are implanted per year in Switzerland for diagnoses of primary coxarthrosis and osteonecrosis of the femoral head.

It is indicated when pain and reduced mobility become incompatible with patients' daily activities [5].

This surgery, so widespread in developed countries, is still in its initiation phase in some developing countries. In these countries, the risk factors of hip pathologies still have a little solution and therefore the need for total hip prosthesis is growing rapidly.

The aim of this work was to determine the morbi-mortality of total hip replacements in the short and medium term and to review the literature.

2. Patients and Method

We performed a prospective descriptive study over a period of 9 years, from January 1, 2012, to December 31, 2020.

It involved 45 patients in whom we performed 50 THPs out of 750 procedures.

The patients were 27 men and 18 women, with a mean age of 41 years and extremes of 18 and 72 years.

All patients who had undergone total hip arthroplasty and were followed for at least 2 years and at most 5 years were included.

We excluded from the study patients who were lost to follow-up.

On the eve of the operations, the operating room was washed with water and bleach, then formalized and closed for at least 10 hours.

The Moore posterolateral minimally invasive approach was used.

Two types of prostheses were used: hybrid prostheses (cemented acetabulum, uncemented stem) and uncemented prostheses with a polyethylene-metal fric-

tion couple.

All patients were subjected to an antibiotic therapy protocol specific to our department:

Cefalosporin 3rd generation, 1 g in induction, next day 1 g morning and evening intravenously for 3 days. Metroperfusable 1 vial morning and evening for 3 days.

They all also received non-steroidal anti-inflammatory drugs and analgesics. Low molecular weight heparin as prophylaxis was used for at least 15 days.

The patients who had the lesion in both hips had the second operation in the average interval of 4.5 months with extremes of 3 and 6 months.

Two negative infection tests (white blood cell count (WBC), sedimentation rate (ESR), C-reactive protein (CRP)) at one-month intervals allowed the placement of THP in the infectious lesions.

We calculated the comparative offset to the nonoperated side in patients who had the prosthesis dislocation. The inequality was calculated by the distance between the anterior superior iliac spine and the tip of the medial malleolus. All patients were discharged with a removable knee brace that they kept for 45 days. We reviewed them after 3 weeks, at 45 days, at day 90, and at 6 and 12 months within the first year. Periarticular ossifications were classified according to Brooker [6] and cup loosening according to the classification of Gruen and De Lee [7]. Periprosthetic fractures were classified according to Vancouver [8]. All patients were reviewed between two and five years for comorbidities. Functional results were evaluated according to the Postel Merle d'Aubigné score, which classifies functional results based on pain, mobility, and walking. Statistical data were analyzed in the software epi info. Version 7.0.

3. Results

During the period, we performed 50 THPs out of 750 procedures, *i.e.*, 6.6%.

Primary coxarthrosis was the most frequent diagnosis (60%) (Table 1).

The right side was affected in 21 patients, the left side in 19 patients and the lesion was bilateral in 5 patients.

The mean time to the consultation was 2.4 years with extremes of 1 and 5 years.

The average initial shortening was 2.5 cm with extremes of 1 and 4 cm.

Table 1. Distribution of patients by diagnosis of the 45 patients operated on at the Donka orthopedic trauma department from 2012 to 2020.

Diagnostic	Number	Percentage
Primary Coxarthrosis	30	60
Femoral head necrosis	13	26
Post-infectious ballooning hip	02	04
Femoral neck pseudarthrosis	05	10
Total	50	100

According to the terrain, we noted sickle cell disease at 18%, tuberculosis at 12%, poliomyelitis at 2%, diabetes at 8%, HIV at 8% and hypertension at 10%.

During their follow-up, 9 of our patients developed complications, *i.e.*, 18%. These were paralysis of the external popliteal sciatic nerve, which we noted the day after the operation. The lameness, dislocations, suppurations, and deaths that we recorded in the first three weeks.

Three of the peri-articular fractures occurred in sickle cell patients intraoperatively during stem placement. The fourth fracture occurred at two months, after a fall from his own height.

Peri-articular ossification was noted in the patient at 12 months and loosening at 4 years 6 months.

Among these complications, lameness was the most frequent (12%). See **Table 2**.

Of the 6 patients who had lameness, four had inequality and two had pain.

The comparative offset of the three patients was: the first patient 40 mm/45mm, the second patient 39 mm/45mm and the last patient 43 mm/44mm.

After surgery, the average shortening was 1 cm with extremes of 1 and 2.5 cm.

All patients with body mass index (BMI) > 30 had a shortening with a significant association $p = 0.001$.

The patients who consulted after a two-year delay all had shortenings of at least 1 cm. But we did not find a significant association $p > 0.05$.

Two of the three dislocations occurred in patients with BMI > 30.

The dislocations occurred in uncemented acetabular prostheses see **Figure 1**.

Four patients had a periprosthetic fracture. Of these, 3 were sickle cell patients.

Peri-articular ossification occurred in one patient who had a prosthesis made for pseudarthrosis of the femoral neck (**Figure 2** and **Figure 3**).

We found a correlation between the occurrence of the periprosthetic fracture and sickle cell disease $p = 0.008$.

Table 2. Distribution of 50 THPs according to morbidity and mortality in the Donka orthopedic trauma department from 2012 to 2020.

Complications	Number	Percentage
Limping	06	12
Periprosthetic fracture	04	08
Luxation	03	06
Suppuration	03	06
Death	02	04
Unsealing	01	02
Peri-articular ossification	01	02
Paralysis of the sciatic nerve	01	02

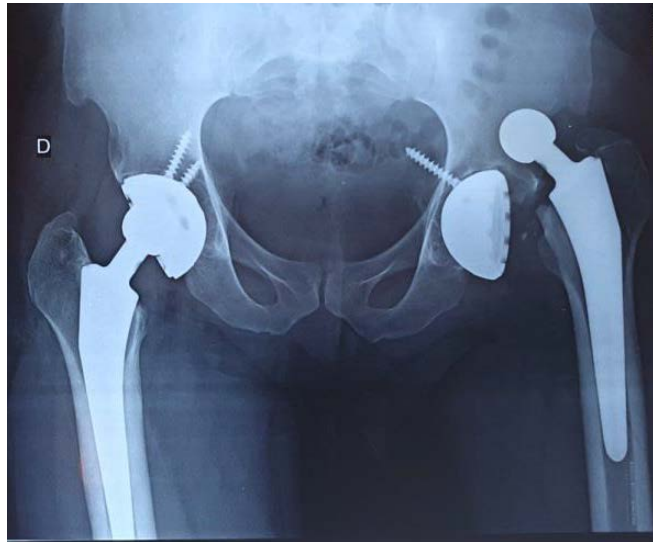


Figure 1. Dislocation of non-cemented THP at day 9.



Figure 2. Radiographic image of a Garden stage 4 femoral neck fracture.



Figure 3. Brooker stage 3 periarticular ossification.

4. Discussion

Our study, being limited in time, does not allow us to discuss all the complications. It requires a long-term follow-up to estimate the survival of our prostheses.

THPs (6.6%) are rare procedures in our practice because of their cost and poor control by surgeons.

Their indications are diverse. In the literature, the indication is coxarthrosis [5] [9] [10], whether primary or secondary.

In our study, coxarthrosis is the most frequent and occurs in the specific conditions listed below, which constitute risk factors.

Sickle cell disease (18%) and tuberculosis (12%) were the most common conditions.

In Cameroon, between 1998 and 2010, Ibrahima F [10] recorded 5 cases of HIV-AIDS, 1 case of sickle cell disease and 1 case of tuberculosis among patients who had the indication for THP.

In our country, patients suffering from sickle cell disease make up 20% of the overall population [11]. The obliteration of the microcirculation in these patients explains the frequency of necrosis of the femoral head.

These are often patients with a very narrow medullary canal. Reamers are required for the placement of the THP stem in these patients. In these patients, planning on good quality radiographs is imperative.

Sène M [12] recorded 8% of periprosthetic fractures in sickle cell patients. According to him, the sclerosis of the medullary canal, the significant thickness of the cortical bone, and the presence of necrotic bone explain the frequency of loosening and fractures. In France, Seiller J *et al.* [13] noted that the prevalence of osteoporosis in young sickle cell patients is higher than in the general French population over 45 years of age. They also noted densitometric osteoporosis in 21 patients (22.7%) at the lumbar level in sickle cell patients.

De Luna *et al.* [14], in their conclusion, noted that the bone of the sickle cell patient is dense but should be considered fragile bone due to the prevalence and type of fracture events and aseptic osteonecrosis. They also confirmed the high prevalence of densitometric osteopenia/osteoporosis in young adult sickle cell patients.

This fragility of the bone in these sickle cell patients was materialized in our study by the ease of occurrence of fractures when the stem was driven into the diaphyseal shaft. As for the cause related to tuberculosis, it is a presumption because it was based solely on the positivity of the Intra dermo reaction to tuberculin.

The main concern in the placement of THP is to minimize morbidity and mortality.

This concern imposes a regular and meticulous follow-up.

We recorded 3 dislocations in the first month. They all occurred in un cemented prostheses that were poorly controlled by the team.

Ibrahima F [15] recorded 5 cases of dislocation in his series.

According to Suva D [16], The risk of THP dislocation is high in the first few months and decreases once the first year is over.

Dislocation alone results in an average 70% increase in cost compared to the initial THP [17].

The risk of dislocation exceeds 10% when a THP is implanted after a cervical fracture [18].

La boiterie était notée chez 6 patients, 4 étaient dues à une inégalité > à 1.5 cm, les autres étaient dues à la douleur.

According to Lacoanet P [7], length inequality persists in 25% of THPs and appears to be the third most common cause of dissatisfaction after THP insertion in France, with its consequences (lumbar pain, lameness, instability and neurological sequelae). A change in the clinical score becomes significant as soon as an inequality of 10 mm is exceeded. This is the second most common cause of legal action in the United States.

In this series of 56 patients, 12 had length inequality, *i.e.*, 21.4% [7].

This inequality can be solved during planning by a play between short, medium and long necks.

In our series, the pain was persistent in 2 patients in whom we had no evidence of infection or aseptic loosening. The offset of more than 5 mm from the contralateral side in these patients could explain the tension in the abductor's muscles that caused the pain.

The pain may have several causes: infection, aseptic loosening, dislocation, periprosthetic fracture, greater trochanter pain syndrome, etc. [1] [19].

In all surgeries, infection is the most important cause. In our series, we recorded 6% of cases. At Hassan II FEZ University Hospital between 2004 and 2012, Azarkane [1] recorded 4.6% in his series.

The infection was declared in our patients within the first two weeks. A cleaning, an antibiotic therapy adapted to the antibiogram allowed to overcome the infection. In all three cases, we kept the prosthesis in place and the patients were subjected to biological monitoring (WBC, SV and CRP) for one year at 3-month intervals.

Loosening and periarticular ossification were rare in our series, admittedly because of the short follow-up time. In 5 years we recorded only one case of loosening and periarticular calcification. The loosening was found in a 35-year-old man in the fifth year after implantation of the prosthesis. This confirms the hypothesis put forward in the work of Rateb K [7], which incriminates young age in aseptic loosening of prostheses.

Male gender is also incriminated in some studies [20] [21]. Men are said to be heavier and more active than women and this fact exposes them to the risk of loosening.

There are still conflicting ideas about BMI. For Johnsen SP [22], weight is a significant factor in the genesis of aseptic loosening, while Yeung E [23] and Rateb K [7] found no increased risk in obese patients. They therefore concluded that weight alone is not a risk factor.

The case of periarticular ossification occurred at 8 months of evolution. It would be expected with the use of indomethacin in the first few weeks after prosthesis placement [24].

The death occurred in two patients. The first one was a patient who had a pulmonary embolism five days after the insertion of the prosthesis while he was at three months of antitubercular treatment. The second patient was a known smoker with a predilection for alcohol and died at home, apparently due to respiratory problems. For these two patients, we incriminate the pulmonary embolism which had occurred while the two patients were under anticoagulant, Enoxaparin sodium 40 UI in subcutaneous once per 24 h. The quality of these drugs and their storage conditions should be checked before use.

The NSPE deficit may be due to excessive and prolonged spreading of the wound edges, which could also damage (sideration) the sciatic nerve.

Our study, being limited in time, does not allow us to analyze all the evolutionary aspects. A second study on long-term complications is still needed to determine the morbidity and mortality associated with total hip replacement.

5. Conclusions

It is now undoubtedly true that THR treats a significant number of hip pathologies. Although very expensive in low-income countries, the expected functional results encourage their placement.

Whoever performs THP is required to monitor the patient as long as he or she is alive. Complications are possible at any time and can negatively change the assigned goal and force the surgeon to be expensive and sometimes inconclusive secondary interventions.

Conflicts of Interest

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

References

- [1] Azarkane, M., Boussakri, H., Shimi, M., Elibrahimi, A. and Elmrini, A. (2013) Les complications tardives de prothèse totale de la hanche: A propos de 42 cas. *Pan African Medical Journal*, **14**, Article No. 17. <https://doi.org/10.11604/pamj.2013.14.17.2265>
- [2] Panayiotis, C., Anne, L., Robin, P. and Pierre, H. (2010) Le point sur la prothèse totale de hanche. *Revue Médicale Suisse*, **6**, 2454-2458.
- [3] Kurtz, S., Ong, K., Lau, E., Mowat, F. and Halpern, M. (2007) Projections of Primary and Revision Hip and Knee Arthroplasty in the United States from 2005 to 2030. *The Journal of Bone and Joint Surgery. American Volume*, **89**, 780-785. <https://doi.org/10.2106/JBJS.F.00222>
- [4] Cerboni, S. and Domenighetti, G. (2008) Variabilité chirurgicale en Suisse. Différences intercantionales observées pour trois interventions. Document de travail 23. Office fédéral de la statistique.
- [5] Zingg, M., Gauthier, M. and Hannouche, D. (2016) Arthroplastie totale de la hanche

- chez le sujet de moins de 50 ans. *Revue Médicale Suisse*, **12**, 2150-2155.
- [6] Hug, K.T., Alton, T.B. and Gee, A.O. (2015) Classifications in Brief: Brooker Classification of Heterotopic Ossification after Total Hip Arthroplasty. *Clinical Orthopaedics and Related Research*, **473**, 2154-2157. <https://doi.org/10.1007/s11999-014-4076-x>
- [7] Kochbati, R., Rbai, H., Jlailia, M., et al. (2016) Facteurs prédictifs de descellement aseptique des prothèses totales cimentées de la hanche. *The Pan African Medical Journal*, **24**, Article No. 260. <https://doi.org/10.11604/pamj.2016.24.260.8164>
- [8] Soenen, M., Migaud, H., Bonnomet, F., et al. (2011) Fractures fémorales interprothétiques: Analyse de 14 cas. Plaidoyer pour un grade supplémentaire dans les classifications de Vancouver ou de la Sofcot. *Revue de Chirurgie Orthopédique et Traumatologique*, **97**, 679-685. <https://doi.org/10.1016/j.rcot.2011.09.010>
- [9] Lacoanet, P., Vargas, M., Pallaro, J., et al. (2018) Inégalités de longueur après prothèse totale de la hanche: Il a-t-il un contrôle satisfaisant des longueurs par voie antérieure sans table orthopédique? Evaluation par EOS 3D sur 56 cas. *Revue de chirurgie orthopédique et traumatologique*, **104**, 771-776. <https://doi.org/10.1016/j.rcot.2018.09.128>
- [10] Ibrahim, F. and Ngandeu, S.M. (2011) Aspects épidémiologiques, diagnostiques et thérapeutiques de la coxarthrose: A propos de 80 cas. *Revue africaine de chirurgie et spécialités*, **5**, 13-17.
- [11] Dramé, M. (2022) Fréquence de la TBC en Guinée ONG SOS-Drépano 2019.
- [12] Sene, M., Dansoko, A., Ndiaye, A., et al. (2006) Arthroplastie totale de hanche dans l'ostéonécrose aseptique du drépanocytaire au Sénégal: Série de 48 prothèses. *Medecine Tropicale*, **69**, 573-576.
- [13] Seiller, J., Merle, B., Fort, R., et al. (2021) L'ostéoporose dans la drépanocytose: Caractéristiques et enjeux. *Revue du Rhumatisme*, **88**, 290-291. <https://doi.org/10.1016/j.rhum.2021.10.495>
- [14] De Luna, G., Khimoud, D., Ribeil, J.A., et al. (2015) La drépanocytose: Une cause méconnue d'ostéopathie condensante. *La Revue de Médecine Interne*, **36**, A95-A96. <https://doi.org/10.1016/j.revmed.2015.10.333>
- [15] Ibrahim, F., Fokam, P., Ngongang, F.O. and Esiéné, A. (2014) Résultats préliminaires des Prothèses totales de la hanche réalisées dans un pays africain à ressource limitée. *Revue de Chirurgie Orthopédique et Traumatologique*, **100**, 264-268. <https://doi.org/10.1016/j.rcot.2014.02.017>
- [16] Suva, D., Lübbecke, A., Pagano, F., Dayer, R. and Hoffmeyer, P. (2009) Luxation d'une arthroplastie totale de la hanche: Etiologie et prise en charge. *Revue Médicale Suisse*, **5**, 2544-2550.
- [17] Sanchez-satelo, J., Haidukewich, G.J. and Boberg, C.J. (2006) Hospital Cast of Dislocation after Primary Total Hip Arthroplasty. *The Journal of Bone and Joint Surgery. American Volume*, **88**, 290-294. <https://doi.org/10.2106/JBJS.D.02799>
- [18] Schmidt, A.H., Leighton, R. and Parvizi, J. (2009) Optimal Arthroplasty for Femoral Neck Fracture: Is Total Hiparthroplasty the Answer? *Journal of Orthopaedic Trauma*, **23**, 428-433. <https://doi.org/10.1097/BOT.0b013e3181761490>
- [19] Moerenhout, K., Benoit, B., Henry, S.G., et al. (2021) La douleur du grand trochanter après prothèse totale de hanche primaire, comparaison entre la voie d'abord antérieure versus postérieure: Analyse secondaire d'une étude randomisée. *Revue de Chirurgie Orthopédique et Traumatologique*, **107**, 997-1002. <https://doi.org/10.1016/j.rcot.2020.10.007>
- [20] Gallo, J., Havranek, V., Zapletalova, J. and Lostak, J. (2010) Male Gender, Charnley

Class C, and Severity of Bone Defects Predict the Risk for Aseptic Loosening in the Cup of ABG I Hip Arthroplasty. *BMC Musculoskeletal Disorders*, **11**, 243-249.
<https://doi.org/10.1186/1471-2474-11-243>

- [21] Berry, D.J., Harmsen, W.S., Cabanela, M.E. and Morrey, B.F. (2002) Twenty-Five-Year Survivorship of Two Thousand Consecutive Primary Charnley Total Hip Replacements: Factors Affecting Survivorship of Acetabular and Femoral Components. *The Journal of Bone and Joint Surgery. American Volume*, **84-A**, 171-177.
<https://doi.org/10.2106/00004623-200202000-00002>
- [22] Johnsen, S.P., Sorensen, H.T., Lucht, U., *et al.* (2006) Patient-Related Predictors of Implant Failure after Primary Total Hip Replacement in the Initial, Short- and Long-Terms: A Nation-Wide Danish Follow-Up Study Including 36,984 Patients. *The Journal of Bone and Joint Surgery. British Volume*, **88**, 1303.
- [23] Yeung, E., Jackson, M., Sexton, S., Walter, W. and Zicat, B. (2011) The Effect of Obesity on the Outcome of Hip and Knee Arthroplasty. *International Orthopaedics*, **35**, 929-934.
- [24] Vastel, L. (2005) Les ossifications péri prothétiques, la complication (un peu trop?) oubliée. *Maitrise Orthopédique*, **143**, 1-5.