

# Total Hip Prosthesis in Dakar and Forensic Implication

El Hadji Oumar Ndoye<sup>1</sup>, Serigne Moussa Badiane<sup>2</sup>, Mohamadou M. Soumah<sup>1</sup>,  
Sidy Ahmet Dia<sup>1</sup>, Mame Coumba Fall<sup>1</sup>, Mor Ndiaye<sup>1</sup>

<sup>1</sup>Faculty of Medicine Pharmaceutics and Odonto-Stomatology, UCAD Service de Médecine Légale et du Travail, Dakar, Sénégal

<sup>2</sup>Faculty of Health Sciences, University Gaston Berger (UGB), Saint-Louis, Sénégal

Email: omar.ndoy@yahoo.com

**How to cite this paper:** Ndoye, E.H.O., Badiane, S.M., Soumah, M.M., Dia, S.A., Fall, M.C. and Ndiaye, M. (2018) Total Hip Prosthesis in Dakar and Forensic Implication. *Forensic Medicine and Anatomy Research*, 6, 37-46.

<https://doi.org/10.4236/fmar.2018.63004>

**Received:** April 10, 2018

**Accepted:** July 3, 2018

**Published:** July 6, 2018

Copyright © 2018 by authors and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

---

## Abstract

The total hip prosthesis is the ultimate treatment of the hip joint's wear. It is a delicate surgery and the most common replacements. This study was performed in the Orthopaedic-Traumatology Department of Public Health Establishment of Aristide Le Dantec in Dakar. It aimed to determine the complications of our total hip and highlight their forensic implications. This is a retrospective study from patients collected from January 2000 up to December 2010. The collection of elements records was performed for each patient, based on a file including age, sex, primary-location's etiology, and types of complications of total hip prostheses. The analysis of these complications has shown that infections, poorly lit information, poor operational planning and technical foul may be the main cause of a forensic implication. This is a retrospective study from patients collected from January 2000 up to December 2010. No lawsuit has been recorded for the complications identified in this work. This is due to the belief in fate, ignorance of the victims and solidarity of the medical profession, the high cost and slow pace of judicial proceedings. The diagnosis of total hip prosthesis complications is mainly based on imaging tests. The absence of scintigraphy in our center remains a limit to the early diagnosis of multiple complications and the proper establishment of the epidemiological profile of these lesions. Taking consciences patients of their rights encourages a legitimate requirement repair the harm inflicted.

## Keywords

Total Hip Replacement, Forensic Implications, Bone Scintigraphy, Articular and Bone Imaging

---

## 1. Introduction

Arthroplasty is a major procedure in Orthopedics. It has become common

thanks to a set of specifications implants and a rigorous implementation protocol. Notwithstanding this, complications may occur due to technical faults. The objective of the implantation of a total hip replacement is to get a mobile, stable and painless hip. Therefore, all results deviating from these three objectives can be considered as a precocious or late failure.

In Senegal, the implantation of total hip prostheses restarted in the late 90s, further to primo-implantations in the 70s.

We are currently facing a substantial increase in medical malpractice suits due to the fact that justice considers that there are postoperative complications, and medical errors which occur and the victims or their relatives are allowed to seek for reparation.

The purpose of our study is to determine the complications of our total hip replacement and highlight their medico-legal implications.

## **2. Methodology**

### **2.1. Study Location**

Our study was conducted in the Orthopaedic-Traumatology Department of Public Health at Aristide Le Dantec in Dakar.

### **2.2. Study Type**

This is a retrospective study collected from patient records from January 2000 to December 2010.

### **2.3. Study Population**

This includes all patients who were received and monitored in the department for a total hip arthroplasty during this period and who experienced postoperative complications. We excluded from this study the records of patients who did not have complications and the deceased or patients that we have lost track of.

### **2.4. File Analysis Methodology**

The collection of data for each patient was retrieved from a file that provided age, sex, etiology of primary-location and types of complications of total hip prostheses.

### **2.5. Ethical Considerations**

All the data were collected from patient records and then recorded on an Excel form for analysis using the software: SSPI.

## **3. Results**

We collected 116 total hip arthroplasty files between January 2000 and December 2010.

### **3.1. Age-Sex**

The average age was 50 years with extremes of 27 and 67 years. There were 8

male patients and a sex ratio of 1.3.

### 3.2. Etiology

The most common etiology was secondary osteoarthritis (64%) followed by primary hip OA 34%.

### 3.3. Complications

14 cases *i.e.* 12% presented postoperative complications. They were distributed in 7 precocious cases and 7 early cases. Precocious failures were dominated by posterior dislocations (22%) followed by infections and loosening associated with dislocations (7%).

The complications encountered were:

- **Infections:** 6 sepsises were observed.
- **Instability:** 5 patients had one or more episodes of precocious dislocation. For 3 patients the dislocation was attributed to a vertical mounting of the acetabulum from a radiological viewpoint.
- **Loosening:** the analysis of radiographs of the pelvis and the hip allowed to find 7 cases of acetabular.

### 3.4. Other Complications

**Bruising:** 3 cases of precocious postoperative hematoma were noted.

**Neurological damage:** 1 right-sided nerve damage was found in a patient operated on both hips.

Any judicial proceeding wasn't noted in the complications registered during the work.

## 4. Discussion

The presence of failure's factors in our total hip replacement leads us to consider medico-legal implications. Most of the time the surgeon's medical liability is put at stake, along with matrimonial and patrimonial prejudices. In order for the surgeon to be held liable, a mistake must have been committed, or some damage results from the surgery, and the cause that links the two be proven.

By doing an analysis of hip replacement complications, the following aspects may be the subject of a forensic implication:

### 4.1. Nosocomial Infections

This infection is the most feared complication after a total hip replacement. According to series, it occurs between 0.5% and 3% of cases [1].

These infections are favored by precarious asepsis conditions in our operating rooms with the absence of laminar flow, the lack of use of gowns and disposable sheets. Indeed, our gowns and drapes are often sterilized in autoclaves. Very often, we do not have the necessary instruments for the validation and routine control of sterilization cycles (physico-chemical indicators of permanent and periodic control).

The prognosis depends on the type of germs but also on other factors such as the importance of bone destruction or the general condition of the patient. The results are analyzed mechanically as well as from infective agents.

The diagnosis context also varies between precocious infection, late infection or septic loosening [2] [3] [4].

On the medico-legal level, the notion of nosocomial infection is extended to all general care activities wherever the place. In the approach of nosocomial infection, institutions are required by a performance security bond. The presumption of blame or fault included led to the duty of safety result [5]. Since the judgment of the French Court of Appeal on June 29th 1999, it is the defendant's responsibility to prove that he does not have anything to do with the cause of the incident. For some judges, diagnosis delay is considered as a loss of opportunity, and thereby engages the surgeon's responsibility. This concept of delayed diagnosis is systematically invoked for infectious complications [6] [7] [8].

In our series, 60% of dislocations are due to poor orientation of the wells. The case of instability occurred in the first four weeks. Therefore, we consider them as early dislocations. However, opinions differ on the time when the first dislocation occur and its early qualification. For some authors Anhfelt *et al.*, Clohisy *et al.*, it must occur within the first five postoperative weeks [9] [10], while for others, it is in the first three months [11] [12] [13]. The circumstances of the dislocation can be traumatic or positional.

In our series, the offending surgical factors are the orientation of the implants and the experience of the practitioner.

Factors related to surgeons allow them to assess centers of excellence in the field. In our series, the postero-external surgical approach was used for all patients. The anterolateral tract trans-muscular are described as less critical from the point of view of stability [14], while the postero-external approach is often implicated in the higher dislocation rate [15] [16].

However, there is much controversy over the choice of surgical approach. The best is the one that the operator masters most.

The orientation of the implants is a critical element. Clinical series studying the subject provide contradictory information. Furthermore, the diversity of experiences shows that there is a probable adaptation of implant positioning according to the anatomy encountered. All these combinations of orientation from one patient to another and from one prosthesis to another, further complicated by the positioning of the femoral component, shows very significantly the role of the surgeon and, the interest of surgical navigation. Unfortunately, the latter does not exist in Senegal. In this context the surgeon may be held liable in the following situations.

#### **4.2. For Default of Information towards the Patient**

In our context, patients are not well informed before surgery. The strong belief in fate is such that Patients are not interested in complications that may occur with the outcome of a medico-surgical performance. Thus, surgeons do not take

enough time to give clear information. The notion of not taking the opportunity to clearly inform and give consent is a means of compensation in the absence of fault, error, or failure of the practitioner. It is up to the practitioner to bring any evidence or presumptive evidence that he has fulfilled his duty to inform. The number of pre-operative consultations, the reflection period between the proposal of intervention and the implementation of the latter are all participatory elements in the establishment of proof or presumption of well-managed information.

One should be reminded that the medical staffs have to cover all serious risks even if they are rare [17].

Total hip replacement is a procedure that can be described as difficult and random. It presents risks that are known but it is obviously difficult to quantify the frequency given the diversity of operating conditions especially in our developing countries.

The information must be accurate and of great quality. One has to take his/her time and weigh his/her words. Insufficient information of the patient before and after surgery is the most common reason for remedies for postoperative complications. Unclear explanations and sometimes omitted ones from the patient or his family by a surgeon who is overwhelmed and in a hurry are increasingly resented. In this situation, the complaints are always the same “we want to know what happened” [7] [8].

This misinformation is an open door to abuses in which families are hiding to claim damages or repairs.

### **4.3. For Poor Operative Planning**

The operative planning is an essential step. The first phase is to get correct Frontal X-ray as well as profile (femoral curvature) with a known enlargement (normally 1.15), and a confirmation of lesions by CT scan images. Going in an operation, with poor quality shots without prior knowledge of the state of the patient's hip bone can be considered as a fault and not simple negligence. The management of a total hip prosthesis requires good preparation of the operative strategy with an experienced and multidisciplinary team. The fault indication is often the result of improper surgical indications due to insufficient or somewhat lack of surprising examination before the surgical procedure. Planning the strategy of a total hip replacement is a necessity to avoid medico-surgical problems.

### **4.4. For a Technical Fault**

The experience of the surgeon is a logical factor because the orientation combination between the components is multiple and varies from one patient to another. In other words, the more the practitioner is faced with the choice of the orientation of the implants, the better they will know their tools and their surgery will improve with time.

Our cases especially acetabular loosening represents 50% of the complications of our arthroplasty.

A tool can only break in case of excessive stress or manufacturing defect. Three actors are involved in this tool failure:

- The surgeon or the hospital. The latter must meet the operating indication, the choice of the implant, the quality of implantation as well as postoperative decisions to develop load on the material.

The hospital has borne the provision in times of the material requested by the surgeon.

- The supplier of the material and or the manufacturer shall make available to the surgeon the material and provide its physical and mechanical characteristics, indications and cons-indications or limitations, the technical installation. The manufacturer must inform users of the risks and limitations of the material.
- The patient must be subject to explicit recommendations to avoid requests going above the material specifications.

In our context, the implants used are supplied by suppliers per unit. Therefore, during the operation, the surgeon is too limited because any false estimation of the dimensions of the implants before the surgical procedure is likely to create delays.

Prosthetic implants are manufactured parts whose quality has evolved over time. Manufacturers have exceeded the artisanal stage and they have turned to industrial manufacturing. Thus, to avoid the repetition of accidents, regulations have been developed with the sole aim to reduce the risks and protect patients. Every effort is made to ensure that the results which the patient gains from the operation outweigh the risks. “Materiovigilance” is defined as a monitoring of incidents or risks of incidents that may result from the use of medical devices after being placed on the market. It is mandatory and comes along with the obligation already made to the manufacturer [18].

Its aim:

- To prevent the risks associated with the use of medical devices;
- Identify and evaluate unexpected risks;
- Decide on actions to be taken.

The notification procedure of the “Materiovigilance” is intended to provide better protection for patients through prevention. It indirectly constitutes the surgeon’s protection in case of forensic disaster induced by a material failure.

The context in which we receive the total hip replacement implants does not allow us to follow the “Materiovigilance”. The implants received are not listed in a register. Therefore, monitoring remains very difficult.

In technical fault, we found in our series indisputable negligence (hemostasis default, sciatic nerve ligation).

The shortcomings of postoperative follow-up result from an excess of confidence, sometimes of gross negligence (an operating aid that ends the interven-

tion), and often the sheer lack of the surgeon to monitor (on vacation or at a seminar). These circumstances are often poorly perceived by the judge, and regardless of the quality of the replacement.

Besides medical imaging examinations dominate in diagnosing complications of total hip prostheses. However, the results of morphological imaging modalities are generally less precocious compared to those of radioisotope technics, with good sensitivity but low specificity (**Figure 1**) [19].

All the same in our context the CT scan allows us to perform a thorough assessment of lesions thanks to its anatomical resolution (**Figure 2**) [20].

To this end the absence in our center of an osteoarticular scintigraphy causes a risk assessment in the frequency of complications. There is a need to improve the technical level, to rehabilitate management algorithms and redefine the epidemiological profile of complications of total hip prostheses.

## 5. Conclusions

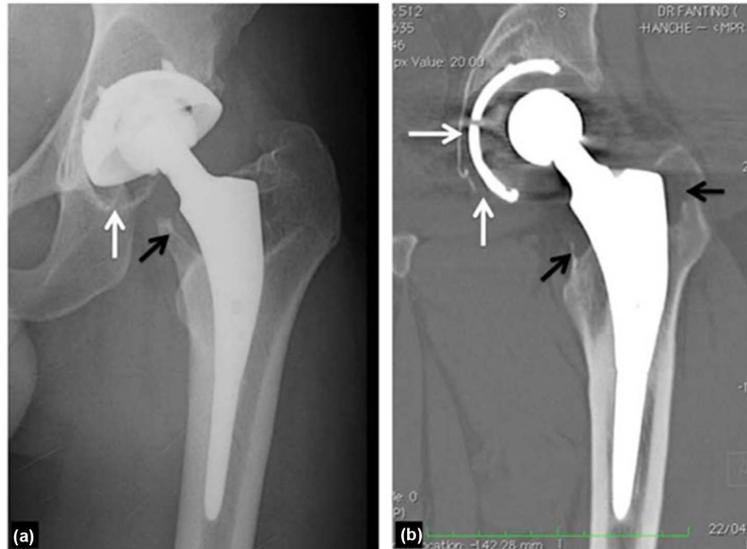
Total hip replacement is a major surgery. It requires the establishment of a strict protocol for anesthetic as well as surgical in the different stages of patient care: pre, per and postoperative.

Our study has helped us highlight the complications of hip replacements. The analysis of these different complications shows that infections, poorly given information, poor planning and operative technical fault may be causing a medico-legal implication.

Multiple scientific advances in the medical field influence the minds of patients to feel of absolute security where failure is considered a foul. In the field of medical or surgical technique, we learn and we move through our practice, our failures, and our complications. The medico-legal implications should not be an exception to our thought process.



**Figure 1.** Bone scintigraphy: septic loosening (Ref: Sutter B, Cazenave A. What expects orthopedic surgeon from bone scan. *Médecine Nucléaire-Imagerie fonctionnelle et métabolique*. 2003, 27 (11)).



**Figure 2.** Cup loosening. (a) face radiography; (b) CT, reconstruction frontal MPR Granuloma by femoral wear debris accompanying lysis calcar (black arrows). Osteolysis around the cup (white arrows) to cause a loosening thereof. (Ref: Fantino O, Tayot O, Sans N, Cyteval C. *Journal de radiologie*. 2011, 92, 594-620).

Thus, to avoid the complications of PTH, should we not acquire a quality approach? This will involve going through an improvement of the technical platform with access to scan for early diagnosis of complications especially the loosening and infection to avoid litigation.

### Funding

No external funds were received to conduct the study.

### Conflict of Interest

The present study has no financial or personal relationship with any person or organization.

### Ethical approval

The departments of forensic medicine and orthopaedics traumatology accepted this study.

### Acknowledgements

In all the structures and the people who facilitated this study.

### References

- [1] Bozic, K.J. and Ries, M.D. (2005) The Impact of Infection after Total Hip Arthroplasty on Hospital and Surgeon Resource Utilization. *The Journal of Bone & Joint Surgery*, **87**, 1746-1751.
- [2] Salvati, E.A., Gonzalez Della Valle, A., Masri, B.A. and Duncan, C.P. (2003) The In-

- ected Total Arthroplasty. *Instructional Course Lectures*, **52**, 223-245.
- [3] Connes, H. (2006) The Infected Recovery. The Recovery of Total Hip Prosthesis. Sauramps Médical Montpellier, Montpellier, 513-514.
- [4] Reina, N., Delaunay, C., Chiron, P., Ramdane, N. and Hamadouche, M. (2013) Place of Infection as the Etiology of Recovery of First-Line Total Hip Arthroplasty and Its Predictive Factors. *Journal of Orthopedic and Traumatological Surgery*, **99**, 462-468.
- [5] Judgment of the French Court of Appeal on June 29th 1999. Court of Cassation Civil Chamber 1 Public Hearing of Tuesday, 29 June 1999 of Appeal: 97-14254. <https://www.legifrance.gouv.fr/affichJuriJudi.do?oldAction>
- [6] Safar, S.H. (2015) Right and Nosocomial Infections. *Law, Deontology & Care*, **15**, 69-75.
- [7] Marmor, S. and Farman, T. (2011) Causes of Forensic Procedures after Total Hip Prosthesis. *Journal of Orthopedic and Traumatological Surgery*, **97**, 752-757.
- [8] Manaouil, C., Berthelet, J., De Lestang, M. and Jardé, O. (2006) Study of 16 Litigation Files That Resulted in a Final Settlement over Three Years in a Hospital Orthopedic Traumatology Service. *Annals of Surgery*, **131**, 524-528.
- [9] Herberts, P., Ahnfeldt, L. and Andersson, G.B.J. (1989) Reoperation for Failure of Total Hip Replacement in Sweden 1979-1983. *Scientific Exhibition at 56th Annual Meeting of the American Academy of Orthopaedic Surgeons*, Las Vegas, 9-14 February 1989. <https://shpr.registercentrum.se/>
- [10] Clohisy, J.C., Calvert, G., Tull, F., McDonald, D. and Maloney, W.J. (2004) Reasons for Revision Hip Surgery: A Retrospective Review. *Clinical Orthopaedics and Related Research*, **429**, 188-192. <https://doi.org/10.1097/01.blo.0000150126.73024.42>
- [11] Joshi, A., Lee, C.M., Markovic, L., Vlatis, G. and Murphy, J.C.M. (1998) Prognosis of Dislocation after Total Hip Arthroplasty. *The Journal of Arthroplasty*, **13**, 17-21. [https://doi.org/10.1016/S0883-5403\(98\)90070-5](https://doi.org/10.1016/S0883-5403(98)90070-5)
- [12] Kordasiewicz, B., Rylski, W., Zakrzewski, P., Sawicki, G., Orłowski, J. and Pomianowski, S. (2003) Dislocation after Total Hip Arthroplasty. *Chirurgia narzadow ruchu i ortopedia polska*, **69**, 325-330.
- [13] Lucht, U. (2000) The Danish Hip Arthroplasty Register. *Acta Orthopaedica*, **71**, 433-439. <https://doi.org/10.1080/000164700317381081>
- [14] Morrey, B.F. (1997) Difficult Complications after Hip Joint Replacement: Dislocation. *Clinical Orthopaedics and Related Research*, **344**, 172-187. <https://doi.org/10.1097/00003086-199711000-00019>
- [15] Frndak, P.A., Mallory, T.H. and Lombardi, A.V. (1993) Translateral Surgical Approach to the Hip: The Abductor Muscle "Split". *Clinical Orthopaedics and Related Research*, **295**, 135-141. <https://doi.org/10.1097/00003086-199310000-00019>
- [16] Moskal, J.T. and Mann, J.W. (2001) Simultaneous Management of Ipsilateral Gonarthrosis and Ununited Tibial Stress Fracture: Combined Total Knee Arthroplasty and Internal Fixation. *The Journal of Arthroplasty*, **16**, 506-511. <https://doi.org/10.1054/arth.2001.22276>
- [17] Decree No. 67-147 of February 10, 1967 Instituting the Code of Ethics.
- [18] Decree No. 96/32 of 15 January 1996 on Materiovigilance Exercised on Medical Devices and Motivating the Public Health Code (Second Part: Decrees in Council of State) Medical Equipment and Materiovigilance in the European Context. [http://www.sante.gouv.fr/IMG/pdf/referentiel\\_seculte\\_sanitaire\\_2010.pdf](http://www.sante.gouv.fr/IMG/pdf/referentiel_seculte_sanitaire_2010.pdf)

- [19] Sutter, B. and Cazenave, A. (2003) What Expects Orthopedic Surgeon from Bone Scan?
- [20] Fantino, O., Tayot, O., Sans, N. and Cyteval, C. (2011) Imaging of Total Hip Prostheses: Normal and Pathological Appearance, Place of Ultrasound, CT Scan and MRI. *Radiology Journal*, **92**, 594-620.  
<https://doi.org/10.1016/j.jradio.2011.04.007>