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Epidemiology and treatment of Ahlback stage III to V knee osteoarthritis by total knee prostheses at Owendo University teaching hospital: About 60 cases

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Abstract

The management of advanced knee osteoarthritis remains a subject of discussion. The use of total knee prosthesis is a solution to improve the quality of life's patients. The aim of this work was to describe the epidemiology and evaluate the results of a series of 60 cases advanced knee osteoarthritis, treated with total knee prostheses in the department. This was a retrospective study conducted from May 2016 to May 2020 at the Owendo University Teaching Hospital. The study concerned the analysis of the files of patients operated on for advanced AHLBACK stage III to V knee osteoarthritis by total knee prostheses. The study variables collected from a survey sheet were analyzed using Excel version 2016 software. We collected 60 patients including 42 women (70%) and 18 men (30%). The average age of the patients was 63.5 years. All patients were operated on under regional anesthesia in the supine position without a pneumatic tourniquet. The surgical site was approached anteromedially. The implant was placed in the left knee in 53.3% (n=32) and in the right knee in 46.7% (n=28). The functional results evaluated according to the International Knee Society (IKS) score were favorable in 96.7% (n=58). In conclusion, knee osteoarthritis is a condition of elderly females. Its treatment, using total knee prostheses, evaluated according to the IKS score, gave satisfactory results.

Keywords: Epidemiology, treatment, gonarthrosis, Ahlback score, total knee prosthesis

Introduction

Knee osteoarthritis is a chronic and progressive arthropathic disease of the knee characterized by degenerative changes in the knee cartilage and hypertrophic changes in the bone tissue around the joint surface [1]. It manifests clinically as pain and functional impotence of varying severity, causing real disability to varying degrees [2, 3]. In the Gabonese context, the diagnosis of knee osteoarthritis is most often made at the late stage with significant functional disability leading to poor quality of life. Its management is still a subject of discussion [4]. Total knee replacement is often the last resort to improve the quality of life of patients. It is mainly indicated for patients suffering from advanced knee osteoarthritis, when it becomes disabling and painful and no longer responds to conservative medical and physiotherapeutic treatments [5]. Although it is now a mature surgical technique, TKA remains, in our context, a recent technique. It was introduced in Gabon in April 2016 thanks to the will of the authorities of the Owendo University Hospital Center, who were able to establish a partnership with the Dijon University Hospital in France which provided technical support during the first course caravans including the first prostheses were able to be fitted. The results of TKA in the literature are excellent in patients aged 70 or over. They can still be improved in younger and more active patients who use their implants longer and more intensely. The aim of this work was to describe the epidemiology and evaluate the preliminary results of patients preferring advanced Ahlback stage III to V knee osteoarthritis, in the department, by total knee prostheses.

Patients and methods

Study framework: Our study was carried out in orthopedic and traumatology department of

Type of study

We carried out a retrospective study with a descriptive and single-center aim over a period of 4 years from May 2, 2016 to May 2, 2020.

Inclusion and non-inclusion criteria

The study concerned the analysis of the files of patients operated on for AHLBACK stage III to V gonarthrosis by total knee prostheses and who were followed regularly in outpatient consultation by a clinical and radiographic control examination until a follow-up. Minimum of 24 months. All unoperated knee osteoarthritis and those lost to follow-up as well as those with incomplete medical records were excluded from the study.

Data collection

The study variables were collected using a survey form developed for the study. Our results were evaluated using the International Knee Society (IKS) score, based on the criteria of pain, joint mobility and function.

Data analysis

Data analysis was carried out using Word and Excel 2016 software. The qualitative variables were expressed in number and percentage. The interpretation of the data was made by comparing the percentages

Results

We collected 60 patients including 42 women (70%) and 18 men (30%), either a sex ratio of 0.43. The average age of the patients was 63.5 years with extremes of 48 and 81 years. The age group of 60-69 years was predominant in the series with 35% (n=21). The average weight of the patients was 85.7 kg with extremes of 46 and 138 kg. The height fluctuated between 1.52 m and 1.80 m with an average of 1.66 m. The average body mass index (BMI) was 31.53. Obesity was noted in 60% (n=36) of cases. Examination of the knee revealed deformation of the joint in 83.3% (n=50) (Fig 1).



Fig 1: obese patient with advanced knee osteoarthritis with varum deformity on the right and valgum deformity on the left (Image from the orthopedic traumatology department of the CHUO)

and painful joint mobility in 46.7% (n=28), the Lequesne functional index was achieved in 58.3% (n=35) with an average score of 14.0. An X-ray of the knee with frontal and lateral views was carried out in all patients, associated with a Schuss view in 80% (n=48) of cases, a Computed Tomography (CT) examination of the knee in 6.7%. (n=4) of cases and MRI in 3.3% (n=2) of cases. The imaging performed revealed knee osteoarthritis in all patients at different stages according to the AHLBACK classification (Fig 2 and Table 1).



Fig 2: internal femorotibial gonarthrosis advanced to Ahlback stage V (image from the orthopedic traumatology department of the CHUO)

Table 1: distribution of patients according to radiological lesions observed

Radiological damage	Effective	%
Gonarthrosis	60	100
Stage III	20	33, 3
Stage IV	31	51, 7
Stage V	9	15
Sequela of poliomyelitis	1	1, 7
Cruciate ligament rupture	1	1, 7

The overall deviation angle which measured the deformation was on average 13.8 with extremes of 4 to 27. Radiologically, we obtained a normal correction of the mechanical axis in 85% (n=51) of the cases. Cases and hypo correction in 15% (n=9) of cases. Therapeutically, all patients were operated on under locoregional anesthesia in the supine position without a pneumatic tourniquet. The surgical site was approached via an anteromedial and internal parapatellar approach. The implant was placed in the left knee in 53.3% (n=32) and in the right

knee in 46.7% (n=28). It was a postero-stabilized sliding prosthesis Rolflex Tonic from the Evolutis laboratory in France in 88.3% (n=53) and a B-Rotax hinged prosthesis from the Aston laboratory in France in 11.7%. (n=7) (Figure 3 and Fig 4).



Fig 3: Postero-stabilized sliding prosthesis (Image from the orthopedic traumatology department of the CHUO)

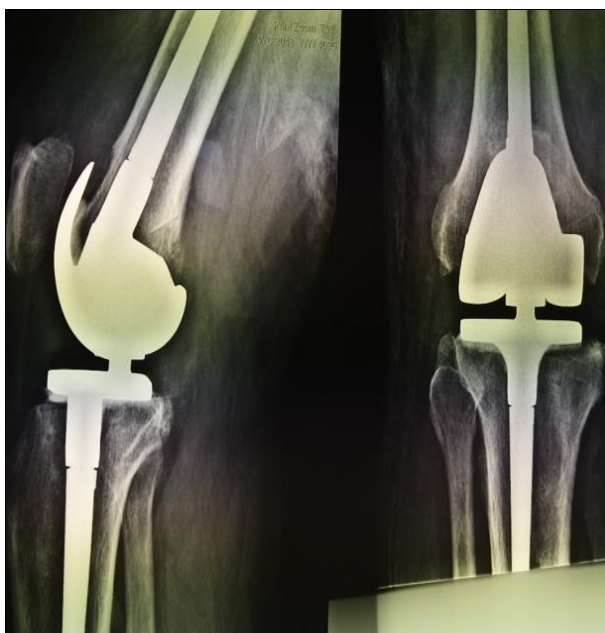


Fig 4: hinged prosthesis in a 78-year-old patient (Image from the orthopedic traumatology department of the CHUO)

The interventions took place without incident in 98.3% (n=59), the only incident noted was a fracture of the tibial plateau in 1.7% (n=1) requiring osteosynthesis by direct screwing intraoperatively during of the same intervention (Fig 5).



Fig 5: fracture of the external tibial plateau occurring intraoperatively in a left TKA, treated by direct screwing (Image from the orthopedic traumatology department of the CHUO)

In this series, we noted 33.3% (n=20) of complications, mainly persistence of pain in 21.7% (n=13), infection of the surgical site in 3.3% (n=2), of a fracture of the tibial plateau in 1.7% (n=1), synthesized intraoperatively by direct screwing. To evaluate our results, we opted for the International Knee Society (IKS) score, based on functional criteria: pain, joint mobility and function. With an average follow-up of 24 months, we noted a favorable functional outcome in 96.7% (n=58) with a disappearance of pain in 80% (n=48) and a reduction in 20% (n=12). Joint mobility was improved in 78% (n=47): the average flexion postoperatively was 105° instead of 90° preoperatively. The walking perimeter became unlimited again in 58.3% (n=35). Overall, we obtained very good results in 78.3% (n=47), average results in 20% (n=12) and poor results in 1.7% (n=1). TKA arthroplasties had a total cost of 245,000 CFA francs or 374 euros with health insurance (CNAMGS) and 1,190.000 CFA francs or 1820 euros, without health insurance. In France, the costs of TKA vary depending on the implant supplier laboratories from 9,000 euros to 17,000 euros for standard TKA.

Discussion

Demographic data

In this series, we collected 60 patients including 42 women (70%) and 18 men (30%), either a M/F sex ratio of 0.43. the average age was 63.5 years with extremes of 49 and 81 years. The age group from 60 to 69 years was predominant in the series with 35% (n=21). These results are comparable to those of Bakriga *et al.* in Togo [6] who found in their series an average age of 64.5 years with extremes of 39 years and 87 years. These results confirm that knee osteoarthritis is a condition of the elderly; it is unanimously recognized that the prevalence and incidence of knee osteoarthritis increase with age [7, 8]. The female predominance found in this series is present in other studies and is consistent with the data in the literature thus affirming that female sex is a risk factor for the occurrence of knee osteoarthritis [9, 11]. Several studies suggest that taking estrogen replacement therapy at menopause is associated with a reduction in the risk of knee osteoarthritis [12, 13].

Clinical data

In this study, the average body mass index (BMI) was 31.53, obesity was noted in 60% (n=36) of cases, several studies have established that osteoarthritic disease occurs most often in presence of obesity; there is a close relationship between the increase in body mass index and the occurrence of knee osteoarthritis [14, 15], in women, the loss of 5kg of body weight reduces the risk of knee osteoarthritis by 50% [13].

Paraclinical data and diagnosis

In the series, the imaging performed made it possible to stage the knee osteoarthritis of our patients according to Ahlback, thus, our patients presented tri-compartmental knee osteoarthritis progressed to stages III, IV and V with abnormalities of the axes. In the series, we noted 60% (n=36) of genu varum; in the literature, genu varum appears to be a risk factor for the occurrence of knee osteoarthritis [16]. The series noted 13.3% (n=8) of previous trauma and 3.3% (n=2) of meniscectomy. TKA with a history of trauma or surgery exposes the risk of specific complications: problems with healing, knee stiffness and rupture of the extensor system [17].

Therapeutic and evolutionary data: Therapeutically, all our patients were operated on under locoregional anesthesia in the supine position; the Moroccan study by Eddarissi noted 83% of TKAs operated under locoregional anesthesia and 17% under general anesthesia [18]. The surgical site was approached via an anteromedial and internal parapatellar approach. The medial or lateral approach is linked to the importance of the preoperative frontal deformation to the retraction of the soft tissues [19]. The implants concerned the left knee in 53.3% (n=32) and the right knee in 46.7% (n=28). These were postero-stabilized sliding prostheses in 88.3% (n=53) and hinged prostheses in 11.7% (n=7), the approach and the type of implant are consistent. Data from the literature [6, 20]. In this study, we noted some complications which are essentially infections of the surgical site which are justified by the conditions in which we work with sometimes non-compliance with asepsis standards. The functional results evaluated by the IKS score gave us very good results in 78.3% (n=47); these good results could be explained by the analgesic effect of total knee arthroplasty. At a mean follow-up of 24 months, 80% (n=48) had complete disappearance of pain and 20% (n=12) had reduced pain. To this, we add a standard correction of the femorotibial axis. These results are consistent with literature data [6, 21, 22]. Arthroplasty costs in Gabon seem affordable for patients covered by health insurance compared to Europe, despite this, because of the payment of the co-payment which is set at 20% of the amount to be paid, some patients experience difficulties access to PTG, this is due to the fact that the majority of patients are economically weak and unemployed and therefore unable to pay the 20% required as a contribution for their care.

Conclusion

Our study confirmed that knee osteoarthritis is a condition of elderly females. Obesity and genu varum have been particularly noted as a risk factor. Imaging makes it possible to make the diagnosis and stage knee osteoarthritis according to AHLBACK. Total knee prosthesis is an intervention of choice in advanced knee osteoarthritis. The results obtained with the sliding prostheses and hinge prostheses put in place during the various caravans were satisfactory, the IKS score gave us a favorable functional assessment in the majority of cases. The cost of TKA in Gabon compared to France remains

affordable but still inaccessible to economically weak patients even with health insurance.

Conflict of interest

The authors declare that they have no conflict of interest relating to the writing of this article.

Ethics approval

The permission for the study was obtained from the competent authorities of the CHUO, as well as the head of the orthopedics-traumatology department. Arrangements have been made for the implementation of the study in order to guarantee confidentiality. The consent of patients or their families in the event of incapacity has been given. The anonymity of the patients was respected.

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