Is Hip Arthroplasty Viable in A Developing African Country?

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Arthroplasty is an established management of various joint disorders in developed countries. Poverty has caused African countries to remain behind in this sphere of management and condemned sufferers to a life of misery and immobility. In this review, the viability of total hip arthroplasty (THR) is examined. The need, constraints and difficulties encountered in this field of surgery are examined. There are only a few cases of THR done previously and literature on this has been scarce. It is hoped that if the arrangement suggested in this review is established it will be possible to carry out this branch of Orthopaedic surgery in various countries of our region.

Introduction

Arthroplasty has been defined as an operation to alleviate pain and restore motion to a joint. This is done to a joint which is very painful and to a large extent has very limited movement. Arthroplasty has been developed over a long period since the 19th century and has gone through several phases which I will not go through here. Suffice to state that in developed countries arthroplasty has been done over many years[1]. The Asiatic countries also caught on very quickly, but poverty has retarded the development of this surgery in Africa south of Sahara and north of Limpopo. Very little literature is found on this subject in the African Journals.

It should not be construed to mean that the indications for this surgery are not there. In fact these exist in plenty as will be presently shown. In Kenya before 1981, total hip replacement (THR) was only rarely done. Although maladies like fractures of neck of femur were seen these were only treated by supervised neglect, excision arthroplasty (Girdlestone) or hemiarthroplasty of the Austine Moore and Thompsons prosthesis type. Total hip replacement was done once in four to six or even more months. Knee arthrosplasty was of course out of the question as early knee prostheses had a very low success rate.

With current technology, almost every joint in the body can be reconstructed, but in Kenya currently only three joints are reconstructed namely hip, knee and shoulder which is in its nascent stage. Excision arthroplasty of the elbow is done where indicated, but the pathology requiring elbow arthroplasty is low and success rate where it is done is also low so that with the very limited resources, priority on this is low.

What were the justifications for THR.

The indications for this operation were many. Afflicted individuals were virtually prisoners in their homesteads. Travel was mostly on foot and without motor vehicles one was not able to go far with a bad hip. The technology had improved and the doctors with technological know how became increasingly available. The medical school was teaching postgraduates who later went on to do further studies or practice in other countries. These postgraduates needed to be comparable to their counterparts elsewhere. The patient was becoming more aware of the availability of the technology elsewhere so he/she made demands on the health practitioners.

What were the Impediments?

The Ministry of Health priorities were elsewhere, i.e dealing with communicable diseases such as malaria, diarrhoeal diseases of childhood, pneumonias and other diseases of that nature so that things like THR, cardiac surgery and renal transplants were way below on the priority list. Orthopaedic surgeons were few and with very limited training in this field. Cost of the prosthesis and surgery of this nature was in general very high.

Kenyans love treatment abroad, and those affected who could afford opted for treatment abroad. Prosthetic manufacturers were not eager on this market as it offered very little prospects for profit. Elsewhere operations were done in vacuum tents in space suits or in theatres with laminar air flow. These are facilities most African countries, Kenya included only dream of. So it was thought not safe to carry out this type of surgery frequently. Information to the population

on this type of treatment was scarce. Nobody was sure whether THR was compatible with toilet habits of the rural folk.

The changed situation:

The number of trained Orthopaedic surgeons in Kenya has changed greatly. Kenya now boasts of 50 Orthopaedic surgeons with more in training. Some of these surgeons are very highly trained and have practiced in developed countries carrying out very complicated arthroplasties. The indications for THR have increased with population demographic changes as well as knowledge. All these favour this kind of surgery.

Indications of THR

In this sphere, African countries and Kenya like any other country in the world have similar indications for THR. Top on our list is Osteoarthritis (OA), fractures of neck of femur, avascular necrosis of femoral head (ANFH) this one caused by alcohol, sickle cell anaemia, steroids and radiation. Other indications include rheumatoid arthritis (RhA), trauma, neoplasm, infection and miscellaneous indications. Some indications mentioned above are relative. The position of THR post infection is still controversial except in tuberculosis of the hip where arthroplasty after control of infection is relatively safe.

Types of Prosthesis Available.

It is known that there are more than 300 types of hip prostheses in the world[2]. For a poor country like Kenya, it would be unwise to go in for all of them. What has been done is that senior surgeons in this field have got together with the importers and selected a few models which were selected on their versatility, cost, durability, experience of the surgeons, ease of operation and support of the suppliers. At first, the Muller-Brunswick type was the only one available, but this has been faced out. Now there has been change to the modular prosthesis.

There are only three main companies to choose from. They have included the Elite plus of Johnson and Johnson, Spectron of Smith and Nephew and the Charnely type from synthesis. Soon the resurfacing prosthesis is going to be imported to try out on young patients with ANFH. A few long stem prostheses are kept for occasional use. There are other varieties but in small quantities.

Instruments

It became obvious very early on that our hospitals could not afford to buy and maintain instruments for THR. Kenyatta National Hospital in which most of these operations are done found it very difficult to change from the Muller prosthesis instruments to the Modular system. So it was decided to adopt the South African system. In this system, each company has and owns its instrument sets and prostheses.

The instruments are kept by the company or in a hospital but are owned by the company. The surgeon plans the operation, books the patient into a hospital and lets the company know. The instruments and prostheses are delivered to the theatre, the operation is done and the company charges for the prostheses used only.

In this way the operation can be done in any hospital with acceptable theatre facilities. The hospital does not tie down its funds on instruments and prostheses. The hospitals are protected from rapid changes in technology as changing of instruments is not their loss. Each company sees to it that Continuing Professional Development (CPD) and Continuing Medical Education (CME) for its system are maintained and this improves the surgeons' performance. This system works best if the prostheses are paid for in advance or the hospitals guarantee the payment.

Volume of Work.

Indeed the volume of work was the cause of reluctance of companies to plunge into the African markets. However, it should be noted that the volume goes up as the population becomes aware of the availability of the service. Before 1981, occasional THRs were done in Kenya, then the volume went to one prosthesis a month, then two and so on. In 2004, 152 THR are recorded to have been done. The figure dropped a little in 2005, but in 2006 the average is 5 prostheses a week.

Cost:

In 2004 the cost of THR was USD 2000 in a public hospital, USD 1650 in a mission hospital and USD 4000 in a fully private hospital. The uncemented prosthesis is about three times the above prices. These prices assume only one week hospital stay. The prices had not changed substantially in 2006. Can these prices be reduced any further? Areas to look at include the suppliers, hospital mark up percentages and surgeons fees.

Complications of THR

Most complications seen are like those seen elsewhere. They include fractured femur at the time of operation; dislocations, loosening, infections, perforation of proximal femur, cyst formations, thigh pain, fractures of femora distal to the prostheses and migration of the acetabular cup into the pelvis. It is noteworthy that Deep Venous Thrombosis, as seen in the west is a very rare complication[3]. Indeed fatalities from this cause are very rare. Most patients are discharged from the hospital between 7 and 10 days in cases of unilateral replacement.

Causes of these complications include inexperience on part of the surgeon, inadequacies in theatres, poor population control in theatres[4] inadequacy of postoperative care in overcrowded wards and very poor follow up. It should be pointed out that in spite of the many short comings, complications are very few. In the 2004 series, there was a complication rate of only 4 percent. So far no complications have been recorded that are purely attributable to toilet habits in the rural areas.

The Future

Already revision surgery is being done, but revision surgery equipment is inadequate. So this has to be improved. It has been realized that follow-up has to be improved and a computer has been provided by Johnson and Johnson to the Chairman of the Kenya Orthopaedic Association to keep record and follow up of all the THRs done. The position of uncemented prosthesis will be re-examined, the problem is simply cost. Self and group evaluation after THR has been suggested, criteria being looked at[5,6].

The position of bipolar prosthesis is being evaluated as these when used amount to double cost when they have to be replaced. Adequate training of personnel, especially doctors and nurses is a priority. A committee has been set to look at the criteria for doing THR and a point system will be preferable.

In spite of the difficulties currently encountered, the future of this surgery in the region is bright, and already a number of countries in the region have started it in small measures.

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