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Global health and orthopaedic surgery—A call for international morbidity and mortality conferences

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ABSTRACT

INTRODUCTION: There is a large discrepancy between supply and demand of surgical services in developing countries. This inequality holds true in orthopaedic surgery and the delivery of musculoskeletal care. Intertwined amongst the decision to perform surgical procedures in the developing world are the ethics of doing so – just because one is capable of performing a procedure, should it be done?
PRESENTATION OF CASE: A 31 year-old female with end-stage joint destruction underwent a left total hip replacement by a foreign orthopaedic team in Tanzania. She had a favorable outcome for 8 months, but is now diagnosed with tuberculosis and a deep space infection in her prosthetic left hip – an unsolvable problem in the developing world.
DISCUSSION: This case demonstrates the ethical challenges that can be created from performing surgical procedures in the developing world without concomitant access to appropriate patient follow-up or resources for treating post-operative complications. While the current system is inadequate to manage the burden of disease, these inadequacies may be exacerbated at times by post-operative complications resulting from well-intentioned surgical missions.
CONCLUSION: This case illustrates many difficulties in caring for individuals in the developing world, raising several questions: (1) How can complications be prevented in the future? (2) What are possible ways of managing complications with resources at hand once it occurs? (3) What resources are needed to minimize patient? Ideally an international forum can help provide descriptions of issues and problems that are encountered so as to increase awareness and identify potential solutions.

1. Introduction

There is a large discrepancy between the supply and demand of surgical services in the developing world, especially for nations in Sub-Saharan Africa. In 2008, of the estimated 235 million surgical procedures performed annually, only 3.5% was performed in developing countries [1]. This inequality also holds true in the field of orthopaedic surgery and the delivery of musculoskeletal care. Over the past decade, many countries in Africa have experienced economic growth, which has been associated with a marked increase in motor vehicle traffic [2]. This has led to an increase in injuries from road traffic accidents (RTA) secondary to a lack of concomitant investment in infrastructure, implementation of traffic and safety laws, and noncompliance with the use of seat-belts and helmets.

There has been longstanding and growing interest from the developed world in assisting the developing world, including providing surgical services. Involvement in the early 19th century began with a religious focus through "mission trips" that commonly had evangelical motives. The mission trip concept has evolved beyond religious goals to include trips geared towards providing medical and surgical care in the developing world during periodic short trips by medical teams. The typical goals of such trips are to treat patients in need, decrease the local burden of disease through direct patient care and to build local capacity through education and training. In 2012, there were approximately 6000 such medical missions with approximately $250 million raised for funding [3].

In recent years, a growing number of teams of well-intentioned international orthopaedic surgeons have volunteered their time and expertise on trips to the developing world. These medical missions are designed to perform a high volume of surgical procedures over a short period of time. During these trips, a large amount of

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material resources are transferred to the developing world in order to create a functional operating room facility in the target country.

Such surgical missions are assumed to be effective in achieving their goals, however, this approach to care raises several questions related to the medical, economic, and social state of the target country including: (1) What happens to patients that develop a post-operative complication after the surgical team returns to their native country? (2) Are there facilities available for patients to receive treatment for the complication? (3) Are the intellectual and material resources at the facility adequate to provide the appropriate treatment for complications? (4) Is the infrastructure suitable for patients to travel from their homes to the facility? (5) Assuming that a treatment facility and resources are available, is the treatment affordable to the patient? (6) Is the treatment culturally acceptable to the patient?

Intertwined amongst the decision to perform surgical procedures in the developing world are the ethics of doing so – just because one is capable of performing a procedure, should it be done? Is a procedure such as a total hip replacement, which is appropriate in a developed country, also appropriate in a country with fewer resources for postoperative care? Systems limitations locally within the target country may result in patients being left in worse positions than they were prior to treatment. We present a case performed in Tanzania that resulted in the development of an untreatable post-operative complication. This testimony highlights the urgent need for a different approach to providing surgical services in the developing world, but also emphasizes the need for open forums for discussion of international morbidity and mortality cases.

2. Presentation of case

SM is a woman who at age 31 resided in a small rural village on the outskirts of Nairobi, Kenya. She lived with her parents and her two younger brothers in a 20 ft × 20 ft dwelling. At the age of 5, she was afflicted with a condition that affected several of her major joints. She was diagnosed with rheumatoid arthritis. Her condition was not treated medically due to a lack of family resources as well the limited availability of local treatment options. She was fortunate to be well educated and has completed high school after which she obtained a clerical position at a printing a press and was able to work daily, although with severe pain and deformities.

As she grew, she had noticed worsening left hip pain. The pain was located in the left groin and was present at rest, but exacerbated with motion. By the age of 29, the left hip was auto-fused to her pelvis resulting in no range of motion and a significant residual deformity. By this point, most of the symptoms were consistent with low back pain and degenerative disk disease due to increased loads experienced across the lumbosacral spine secondary to the auto-fusion of the left hip.

In July 2012, at 33 years of age, the patient sought treatment from a rheumatologist in Nairobi and was told that she would need a total hip replacement (THR). However, a THR in Nairobi would cost $7000, which was cost-prohibitive. Although discouraged, the patient tenaciously sought alternative routes for getting the appropriate treatment. By November 2012, due to the severe soft-tissue contracture (e.g., severe adduction contracture) surrounding the left hip, she was unable to urinate comfortably and was unable to have children because vaginal delivery would not be possible.

In November 2012, a rheumatology conference was held in Nairobi. A rheumatology colleague from one of the authors (NPS) home University in the United States attended the conference and met the patient. Intrigued by her story, she contacted the author upon her return and asked him to engage in her care. In February 2013, the author was scheduled to travel to a hospital in Arusha, Tanzania for a short teaching trip, which is approximately 250 miles from the patient's home. It was agreed upon to meet the patient in Arusha, along with new radiographs of the pelvis and left hip as well baseline labs including a sedimentation rate (ESR) and C-reactive protein (CRP).

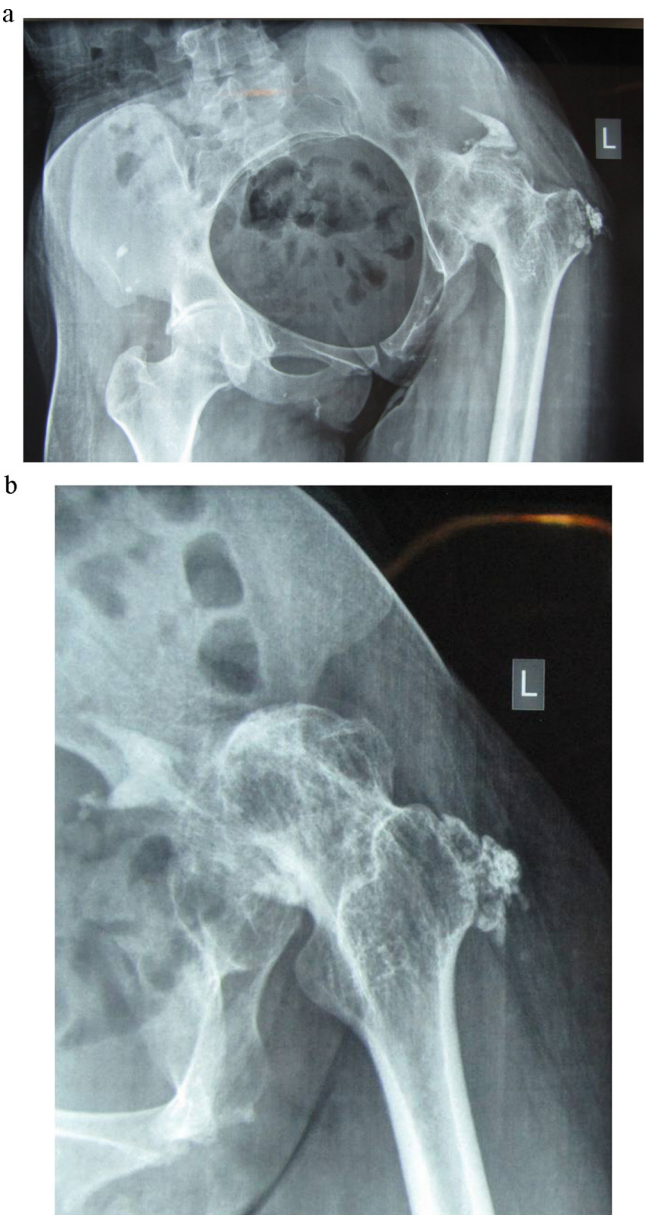

Fig. 1. Pre-operative (a) anteroposterior (AP) pelvis and (b) lateral X-ray projections of the left hip.

In February 2013, the patient traveled by Tuk–Tuk (an open air carriage so named because of the sound of the motor) for 9 h to meet the surgeon and the orthopaedic team at the Arusha Lutheran Medical Center in Tanzania. She presented with the requested radiographs (Fig. 1a and b) and the requested laboratory work. The patient's ESR and CRP were 33 (range 0–20) and 3.2 (range 0–6), respectively. The mildly elevated ESR (normal CRP), although not specific for any given inflammatory process, was consistent with a diagnosis of rheumatoid arthritis, but inconsistent with an infectious process. Based on her normal CRP, a hip aspiration was not performed. It was evident that her deformity was severe and debilitating. The patient stated that the problems she had with her hip permeated her entire life. Her inability to bear children, in turn made her undesirable for marriage.