

Total knee replacement bilateral vs. unilateral



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Osteoarthritis (OA) affects nearly 27 million people in the United States, and is most common cause of disability in the United States. The most common joints affected by OA are hips and knees. Due to this disability it is estimated \$108 billion is lost in wages, and \$80 billion in medical care for people with OA. There is no cure for OA but can be managed with exercise, pharmacologic measures and surgery. Over 600, 000 joint replacement surgeries are performed each year in the US, and approximately 300, 000 of those procedures are knee replacement surgeries (Corporate Communications, 2011).

PROFESSIONAL ISSUES

While working at an orthopedic office, it was brought to the author's attention that two of the surgeons had opposite ideas regarding simultaneous joint replacement (bilateral) or staged joint replacements (unilateral). One surgeon prefers bilateral surgery because he felt the patient had a better outcome, decreased cost to the patient, and there are just as few risks as unilateral. The other physician felt the unilateral is a better choice because the patient is less likely to have complications and shorter hospital stay. Both performed their preferred method weekly on their surgical patients, but not truly understanding the why the other has the stance they do.

The author's focus was to provide an analysis of the benefit of simultaneous bilateral total knee arthroplasty versus unilateral staged total knee arthroplasty for the treatment of osteoarthritis. It came to the author's

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attention whether this was good for patients' health and post op cares and outcomes. Is simultaneous joint replacement more cost effective? Does it have great risk of post-operative complications? Is the patients' outcome better with staged or simultaneous joint replacement? Which procedure is safer for patient? Does one require more rehabilitation afterward?

INTRODUCTION OF PATIENT

PS, a 66-year-old female, presented with complaints of deep aching pain and stiffness in both of her knees. The patient stated this increased after attending exercise classes at the gym on a regular basis. PS's past medical history; obesity, hypertension (HTN), asthma, and hyperlipidemia. Her medication history includes; Simvastatin 10 mg daily, Lopressor HCT 100/25mg daily, Albuterol 2 puffs PRN, and Acetaminophen 325 mg daily for the last six months for pain.

The patient reported she was no longer able to walk her dog due to the severity of her pain or participate in her regular exercise classes with her friends. PS's past social history includes; married with 2 children, worked 30 years as a professor at the local college, attends classes at the gym with her friends 3 days a week and occasional alcohol consumption (socially, two drinks per week). The patient's radiographic images identify narrowing of the joint space in both knees.

PATHOPHYSIOLOGY

Osteoarthritis is the most common type of arthritis; it begins with changes in articular cartilage and progresses to soft tissue damage. Progressive wear

and tear on the cartilage leads to thinning of the joint surface that causes patients to encounter increased inflammation (pain) of a specific joint. Osteoarthritis affects women and men equally; signs and symptoms usually begin to show around age 40. Patients will commonly experience deep aching joint pain, increased swelling and stiffness and increased pain after weight bearing activities. Obesity, aging, genetics, previous injuries and trauma all contribute to causing osteoarthritis of joints (Ignatavicius, 2013). Patients who have more severe symptoms may require intervention sooner.

LITERATURE REVIEW

Valid and reliable research articles on this topic were found from; EBSCO Host and Health Source Nursing Academic from the Gillette College Library database online. Multiple topics were searched: Osteoarthritis, total joints, total knee replacements, unilateral vs. bilateral. These articles were peer reviewed by other experts in this field and published in medical journals. A peer-reviewed journal is considered a reliable source because each article must undergo a rigorous review process, with many professional reviewers involved. (Weida, 2013) Peer-reviewers examine accuracy of factual information, rigor of experimental process, and respond with questions and critique of any conclusion made (Weida, 2013).

COMPARE AND CONTRAST

Overall agreement among the different articles is that the patient's outcome and risks greatly depend on their overall health. They all also agree about the advantage of bilateral sequential total knee replacement under one

anesthetic session includes patient convenience, shortened hospital stay, decrease in cost and rehabilitation (Kim Y, 2009).

According to CME ARTICLE the potential risks of post-operative complications are out weighted by the benefits of doing the procedure simultaneously. Length of hospital stay is reduced with simultaneous procedures and the patients benefit from having additional need for postoperative rehabilitation because of the bilateral surgery. Hospital stays are usually a two to three day stay allowing for patients to achieve independent ambulation and acceptable range of motion before going home. “ It is more convenient and beneficial for the patient to undergoing symmetrical rehabilitation of both knees rather than having a cumbersome rehabilitation regimen with corrected deformity on one side and not eh other should the patient undergo a staged procedure” (Patil, 2008).

Reportedly simultaneous bilateral total knee arthroscopy (TKA) procedures have a cost reduction of 36% for each total knee patient. When the procedure is performed staged the cost to the patient increases 20% (Patil, 2008). Based on the patients outcome from surgery there rehabilitation costs may be higher than those of unilateral staged procedure.

Multiple articles discuss the risk of complications following simultaneous bilateral TKA. The majority of complications come from thromboembolic events, cardiac events, and pulmonary complications. 29% of bilateral TKA patients experienced thromboembolic events as compared to 6% of unilateral TKA patients (March, 2004).

Cardiac complications are the highest risk with simultaneous bilateral TKA. Myocardial infarction, cardiac arrhythmias, congestive cardiac failure, and angina have been reported as post-operative complications. Patients who undergo the procedure which are greater than 80 years old have an increased complication from fluid shifts; they may not have the reserve to manage the shifts after the bilateral procedure. Patients in this age group also have cardiac complications because of their preexisting comorbid medical conditions. (Patil, 2008) With preexisting medical conditions such as diabetes, cardiac dysrhythmias or respiratory issues such as chronic obstructive pulmonary disease (COPD) make the patient at a higher risk because he or she already has a poor function within specific body systems so healing may be poor and complications are at a higher risk.

Pulmonary complications are 80% higher in patients who do simultaneous TKA procedures because of the amount of time the patient is under anesthesia (Patil, 2008). Most bilateral surgical procedures last anywhere from 1.5 hours to 3.5 hours from beginning incision to closing suture. Patients are also at risk for fat embolisms; during the procedure the femur and tibia are cut allowing for fragments of bone and fat to be broken off during the procedure. (Patil, 2008) Overall the majority of patients who have these complications are those at advanced age with previous medical conditions or problems.

There is no substantial difference in morbidity between bilateral and unilateral TKA even when the patient is considered high risk or low risk (Kim Y, 2009). In the study from 2009, " only 0.3% of 2385 patients who had bilateral TKA and 0.7% of patients who had unilateral TKA died from

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complications from surgery within two to three weeks of operation” (Kim Y, 2009). Mortality rates are very similar to those who are low risk and those at high risk. Patients older than 80 years and who have preexisting comorbid factors have been associated with higher mortality in bilateral TKA (Patil, 2008). Concluding, patients are at no further risk of dying from this practice than individuals of similar age dying from natural causes.

IMPACT ON CARE

PS ultimately chose to have simultaneous bilateral total joint replacement. She was admitted to the orthopedic floor at the hospital, stayed a total of three days and was up and walking the day after surgery. She continued to do physical therapy one to two days a week following her procedure for a total of three months to work on range of motion and strengthening. At her six month post-operative visit she claimed to have minimal pain in her knees, was walking with normal gait, discontinued taking her acetaminophen for joint pain and had lost 20 pounds due to her ability to tolerate longer amounts of exercise. She can continue with her weekly exercise classes and go on more frequent walks with her husband and dog. Overall her choice of bilateral joint replacement was effective with few complications, lengthy rehabilitation in turn gave her the best expected outcome.

Simultaneous bilateral TKA may be extremely beneficial to patients; they have fewer follow-up appointments, decreased cost of surgery, and rehabilitation at the same time instead of going through the pain two different times and have the same risks as unilateral. It is important to have the procedure done in an efficient manner and to have an experienced

surgeon with the proper amount of operating room staff. Facilities need to be well equipped with the equipment needed or to have two groups of staff for each knee. Patients who have fewer comorbidity have a greater chance at an outcome with fewer complications.

Proper post-operative care is critical in patient's outcomes following simultaneous bilateral TKA. In order to have the best outcome after surgery patients should begin physical therapy their first post-operative day with passive range of motion. Second post-operative day should include an assessment of the incision and dressing changes along with pain management. By post-operative day eight, the patient should be ambulating with crutches or walker and continuing physical therapy.

Postoperative rehabilitation is very important in the patients final outcome, lack of rehabilitation can lengthen the time it takes for the patient to be back to their previous activity level and may lead to complications such as going into the have the joint manipulated. The patient may need to continue to be on warfarin up until three months postoperatively for prophylaxis reasons, to continue to prevent possible thromboembolic issues (Pagenstert, 2011).

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