

GENERAL VERSUS SPINAL ANESTHESIA: WHICH IS A RISK FACTOR FOR OCTOGENARIAN HIP FRACTURE REPAIR PATIENTS?

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SUMMARY

Background: Most studies have shown no difference between the two types of anesthesia administered to hip fracture patients. This study compared postoperative morbidity and mortality in octogenarian patients who received either general or spinal anesthesia for hip fracture repair.

Methods: We retrospectively analyzed the hospital records of 335 octogenarian patients who received hip fracture repair in our teaching hospital between 2002 and 2006. A total of 167 and 168 patients received general and spinal anesthesia, respectively. Morbidity, mortality, and intraoperative and preoperative variables were compared between groups.

Results: There were no mortality differences between spinal and general anesthesia groups. However, the overall morbidity was greater in the general anesthesia group than in the spinal anesthesia group (21/167 [12.6%] vs. 9/168 [5.4%]; $p=0.02$). Respiratory system-related morbidity was also higher in the general anesthesia group than in the spinal anesthesia group (11/167 [6.6%] vs. 3/168 [1.8%]; $p=0.03$). Logistic regression analysis revealed two significant predictors of postoperative morbidity: anesthesia type (general; odds ratio, 2.39) and preexisting respiratory diseases (odds ratio, 3.38).

Conclusion: General anesthesia increased the risk of postoperative morbidity in octogenarian patients after hip fracture repair, and patients with preexisting respiratory diseases were especially vulnerable. Spinal anesthesia is strongly recommended in such individuals. [International Journal of Gerontology 2010; 4(1): 37–42]

Key Words: elderly, general anesthesia, hip fracture, spinal anesthesia

Introduction

Hip fractures in elderly patients can lead to life-threatening complications and increased mortality^{1,2}.

The geriatric population in Taiwan, comprising almost 10% of the whole population in 2008, is progressively increasing³. Although recovery is slow, surgery is generally very effective for the repair of hip fractures. General and spinal anesthesia are the predominant forms of anesthesia employed for this type of surgery. Extensive procedures typically use general anesthesia; these gaseous or intravenous medications achieve central neurologic depression, and can suppress all protective reflexes, such as coughing and even breathing. In contrast, spinal anesthesia is induced by injecting a



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drug solution into the spinal fluid. This leads to numbness and usually muscular weakness in the lower part of the body, but the patient remains conscious during the procedure, similar to epidural anesthesia.

Numerous reports have compared anesthesia methods and outcomes in hip fracture surgery patients, but no definite consensus has yet arisen as to whether mortality and morbidity can be improved using spinal anesthesia instead of general anesthesia. Several hip fracture repair studies (with various end points) found no differences between spinal and general anesthesia on the outcome of patient morbidity and mortality⁴⁻⁷. Conversely, other studies found that regional anesthesia (spinal or epidural) was associated with decreased negative outcomes after hip fracture repair⁸, total hip replacement⁹ or surgical procedures in general¹⁰.

In our institution, we have noted that the older patients tend to be given spinal anesthesia by anesthesiologists during routine surgical procedures. A previous multicenter retrospective study compared the outcome of hip fracture patients given spinal or general anesthesia and found no difference between these two groups, but the observation that older patients tend to be given spinal anesthesia by anesthesiologists was noted accidentally⁷. This finding implies that most studies show no difference between the two types of anesthesia in hip fracture patients, but in very old patients, most anesthesiologists still prefer to use spinal anesthesia. Therefore, this study aimed to assess whether spinal anesthesia is indeed superior to general anesthesia by causing lower morbidity and mortality in very old patients (≥ 80 years) undergoing hip fracture repair.

Patients and Methods

Patients

The study was conducted in a university-affiliated, teaching tertiary care center in middle Taiwan. A total of 421 octogenarian patients underwent hip fracture repair in the teaching medical center between 2002 and 2006. Patients with multiple fractures (46 cases), with pathologic fractures (three cases), with other acute diseases when admitted (13 cases), or with patient-controlled analgesia (four cases), were excluded from analysis. Patients who received both spinal and general anesthesia (21 cases) were also excluded. The resulting study

population included 335 patients (189 men and 146 women), with an age range from 80 to 99 years.

Variables

Preoperative risk factors for surgery were recorded, including age, sex, underlying diseases, and American Society of Anesthesiologists physical classification (a scale with six designations ranging from a normal healthy patient to a declared brain-dead patient whose organs were removed for donation). Underlying diseases included hypertension, diabetes mellitus, heart disease (congestive heart disease, coronary artery disease, history of myocardial infarction, valvular heart disease, hypertrophic obstructive cardiomyopathy, complete atrioventricular block, atrial fibrillation, sick sinus syndrome, and paroxysmal sinus ventricular tachycardia), respiratory disease (chronic obstructive pulmonary disease, pulmonary tuberculosis, and asthma), history of cerebrovascular accident, and parkinsonism. Intraoperative variables, including blood loss and operation time, were also noted. Procedure-related mortality and morbidity were reviewed and recorded. Perioperative death was defined as deaths that occurred in the hospital due to underlying disease or complications. Morbidity was defined as any perioperative complication that occurred before discharge, including pneumonia, respiratory failure, pleural effusion, delirium, cerebrovascular accident, gastrointestinal bleeding, exacerbated chronic obstructive pulmonary disease, acute renal failure, and cardiac events. Cardiac events were defined as any type of arrhythmia, angina, myocardial infarction, and congestive heart failure.

Spinal anesthesia and general anesthesia

After evaluating the patient conditions of the 335 patients enrolled, the anesthesiologists determined whether the procedure called for general or spinal anesthesia. In total, 167 patients received general anesthesia and 168 patients received spinal anesthesia. Spinal and general anesthesia were induced following standard procedures. Briefly, for spinal anesthesia, lumbar puncture was performed using a 25-gauge needle. When free flow of cerebrospinal fluid was evident, 8–15 mg of bupivacaine was injected. For general anesthesia, patients received intravenous thiopental, a muscle relaxant (atracurium), and narcotic (fentanyl). Mechanical ventilation and inhalation anesthetics were delivered through an endotracheal tube. Central venous pressure was monitored in patients with cardiovascular or

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