

Ethical Considerations around Urgent Hip Hemiarthroplasty during COVID-19: A Case Report

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ABSTRACT

Ethical discussion surrounding management of hip fractures in the elderly has always been challenging, but the recent coronavirus disease-19 (COVID-19) pandemic has superimposed additional difficulties that have to be addressed by clinicians. We present a case report of elderly gentleman with a history of moderate to advanced dementia, who was diagnosed with an intertrochanteric femoral fracture after a fall, and was incidentally found to be COVID-19 positive. After a lengthy discussion with next of kin, he had operative management of his hip fracture, followed by a brief convalescence, and eventual discharge to his nursing facility where he passed away.

Key words: Consenting in coronavirus disease-19, ethics, hemiarthroplasty

INTRODUCTION

Under normal circumstances, the decision to proceed with the urgent surgical repair of hip fracture in an elderly patient with cognitive impairment presents a set of ethical challenges, including demonstrating respect for patient autonomy while soliciting input and informed consent from a surrogate decision maker. When the aforementioned clinical scenario is superimposed on a global pandemic, the ethical considerations surrounding the just allocation of limited health-care resources further complicate the routine risk-benefit analysis. We present and discuss a case of elderly gentleman with dementia, admitted with a fractured hip after a fall, who was also incidentally diagnosed with coronavirus disease-19 (COVID-19) after routine hospital admission COVID screening.

MATERIALS AND METHODS

A 77-year-old male with a recent fall at the skilled nursing facility where he was domiciled was evaluated in our

emergency department for the right hip pain. His medical history was significant for moderate to severe vascular dementia and coronary artery disease. He was also known to have a significant allergy to local anesthesia. On initial evaluation, he was afebrile and hemodynamically stable with good oxygen saturation on room air, but unable to give a history of his other symptoms due to his dementia. A chest radiograph showed patchy infiltrates bilaterally, and a COVID-19 test was positive. He was also subsequently diagnosed with a right intertrochanteric fracture.

Before his admission to hospital from the skilled nursing facility, he required assistance with all his activities of daily living, and there was an initial plan to avoid resuscitation or hospitalization in the event of COVID-19. Given the likelihood of a hip fracture after his fall, the decision was made to send him to hospital for evaluation and assessment.

Our institution did not require informed consent for this case report as the case is not so unique as to be identifiable

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with reference to other public sources and does not contain protected health information.

RESULTS

On the day of his admission, an interdisciplinary meeting was held with a senior anesthesiologist, a geriatrician, and his next of kin, who were also his legally appointed representatives. The initial priorities set forth by the next of kin were for “lack of pain” and “avoidance for medicalized end-of-life.” Options discussed by the medical team included non-surgical management, which would be supported by hospice care, or surgical management, which carried increased but undetermined risks to the patient secondary to his COVID-19 status. After weighing the options, the next of kin eventually opted for surgical management.

The plan was for the patient to be intubated in the intensive care unit (ICU), to limit exposure to environment and staff during the aerosolizing procedure of endotracheal tube placement, then transferred to the operating room (OR) for his procedure. In the ICU, he underwent rapid sequence induction with propofol 150 mg and succinylcholine 100 mg. After the patient was intubated, he was transported on a ventilator, from the ICU to the OR. On arrival in the OR, the patient was placed on the anesthesia machine and maintained with sevoflurane until the conclusion of surgery. Central or peripheral nerve blockade was avoided due to his reported local anesthetic allergy. The hemiarthroplasty was uneventful, and estimated blood loss was 75 mL. He remained hemodynamically stable throughout and was transferred back to the ICU, where he was extubated successfully within 2 h.

He was stepped down to a COVID-19 isolation ward on day 2 of his admission and subsequently discharged back to his nursing facility on day 5. His pain appeared to be well controlled with oral analgesics. He eventually passed away a week after discharge.

DISCUSSION

In the setting of a rapidly evolving global pandemic in which demand for life-saving health-care resources has been demonstrated to be easily overwhelmed by a rapidly transmitted life-threatening respiratory virus, the decision to proceed with an urgent surgical procedure cannot be made following the same ethical paradigms governing such decisions under normal circumstances. Typically, decisions to proceed with a surgical procedure are governed by the ethical framework, principlism. Briefly, principlism is an applied ethics theory framed around four foundational pillars: Respect for autonomy, beneficence, non-maleficence, and justice. Each of the foundational pillars is woven into the decision by a health-care provider to propose a surgical

procedure to a patient or the surrogate on a case-by-case basis.

However, in our current operating construct, preservation of limited resources (i.e., personal protective equipment and blood bank reserves) and risk of transmission to the surgical team are additional considerations. Virtue-based ethical thought would suggest that the surgical team has a duty to provide care, regardless of the personal risk involved. It is generally understood that there is always some risk to providers involved in providing patient care. However, is there a reasonable limit to these risks? Are there consequences for other patients and our ability to provide care should physicians and nurses become infected? Moreover, should these questions influence the application of principlism as we contemplated the surgical repair of our patient’s hip fracture?

Even before the COVID-19 pandemic, this discussion with elderly patient with dementia and a recent hip fracture was challenging. Mortality is high after hip fracture, especially in nursing home patients and ranges from 31% to 54% at 6 months.^[1-3] If the patient elects for surgical repair of the fracture, mortality decreases from 54% to 32%, but the patient risks higher surgical and anesthetic complications.^[1] On the other hand, national data for the proposed surgical procedure in our patient included an overall 10.3% 30-day risk of any major complication, 4.2% risk of pneumonia, and 0.6% risk of cardiac complications.^[4] The relative weight of all of these factors supported the decision to recommend surgical repair.

However, another complicating variable existed that being the paucity of surgical outcome data in COVID-19-positive patients. How could a reliable analysis and discussion of patient-centered risks versus benefit occur when so much is unknown about surgical intervention in COVID-19-positive elderly patients?

One study by Lei *et al.* examined 34 patients who were diagnosed with COVID-19 after surgery and found that surgery accelerated and severely worsened COVID-19 disease progression. A higher proportion of surgical patients required ICU care following surgery than hospitalized COVID-19 patients (44% vs. 26%), indicating more severe disease state and respiratory complications. Mortality was also significantly higher in surgical patients than hospitalized patients (21% vs. 2.3%). Patients with older age, comorbidities such as hypertension, cardiovascular disease, and longer, more technically difficult surgeries were more likely to require ICU care.^[5]

A second larger study by Nepogodiev *et al.* of 1128 surgical patients confirmed these results, with a 30-day mortality of 24% for COVID-19-positive patients who had recent surgery, compared to 21% in the previous study. They also found 51.2% rate of pulmonary complications in the surgical population,

defined as pneumonia, ARDS, or unexpected post-operative ventilation. They did not comment on ICU care. Pre-operative risk factors were male sex, older age, higher ASA grade, and malignant versus benign or obstetric procedure.^[6]

Much of the ethical framework surrounding risk to providers as they care for patients with communicable infectious disease derives from the human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome pandemic. A consensus formed during the HIV pandemic that providers have an ethical duty to maintain patient confidentiality but that duty may be overridden by the more compelling ethical obligations to protect providers from transmission and to inform public health entities.^[7] In our institution, surgical procedures performed on known or suspected COVID-19-positive patients are performed in designated ORs designed specifically to prevent contamination of equipment and reduce transmission of viral particles to the surrounding environment and staff. This poses an unavoidable challenge to patient privacy, but necessary in view of the ethical obligation to maintain a safe environment for patients and staff who are not infected. Given the ease with which the virus is spread and the significant subsequent morbidity and mortality, the ethical duty to protect the public health outweighs the patient's ethical right to confidentiality, representing another example of our crisis-driven ethical paradigm shift.

Much has been made of the ethical justification of allocation of scarce resources (i.e., ICU beds and ventilators) in the current pandemic. However, with available up-to-date data derived from accurate reporting to public health agencies, providers could theoretically anticipate a “surge” in demand and a subsequent scarcity of resources. With this information, a data-driven ethical decision could be and was made. In our case, social distancing, “stay at home orders” and cancellation of non-urgent surgery prevented such a surge at the time of the proposed procedure.

Thus far, our discussion has centered on the ethical basis of the recommendation to proceed with surgical repair of the hip fracture. The ethics of shared decision-making is also an important consideration worthy of discussion. As our patient suffered from moderate to advanced dementia, the responsibility of making informed decisions regarding his health care fell to surrogate decision-makers. In our extensive discussion with the patient's family, we elicited their goals of care for their loved one. Specifically, the degree of physical mobility, the risks of deterioration in his cognitive ability, and the risks of sudden cardiovascular deterioration that could warrant aggressive resuscitation or could lead to his death were explored in detail.

In the shared decision-making process, we offered the scientific, data-driven basis for our recommendation based on available evidence. The family brought to the discussion their subjective beliefs and recollection of previously stated

wishes of the patient regarding his goals of care. As the surrogates' goals of care were in keeping with achievable metrics, namely, relief of pain and restoration of mobility, the surgery was scheduled. In shared decision-making, only procedures for which the expected outcome aligns with the patient's (or their surrogates') wishes should be considered. However, should a procedure be profoundly unlikely to achieve the patient's (or their surrogates') desired outcome, that procedure would be considered non-beneficial. Ethically, our obligation of non-maleficence would preclude us from performing that procedure.

CONCLUSION

Clinicians have an ethical duty to respect the autonomy of patients and weigh the benefits and harms as honestly as they can. From existing evidence, we can extrapolate some risk factors for worse prognosis as well as the generalized increased risk of morbidity and mortality in patients with COVID-19. It is crucial to relay this information to the patient or their decision-makers in a straightforward way to enable informed consent.

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