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**KEY POINTS**

- Hip fractures are and will continue to be a significant health care issue
- Hip fractures usually occur in patients with multiple comorbidities which affect daily patient functional capacity
- Optimal timing for repair is within 48 to 72 hours
- Repair allows for pain control and personal hygiene in patients needing palliative care

Although the rate of hip fractures has decreased in the last decade due to the advent of bisphosphonate and osteoporotic preventative programs, they continue to be a major issue for the health care system and patients alike.<sup>1</sup> There were approximately 300,000 hip fractures in United States in 2010. This number is expected to rise as the population continues to age, with studies expecting there to be more than 500,000 hip fractures per year by 2040.<sup>2,3</sup> This large number of patients creates a large economic burden on the health care system, accounting for more than 16 billion dollars in direct costs and significantly more in indirect costs.<sup>4</sup> Because of the significant financial and clinical burden of this injury it is imperative we understand the treatment and best practices in management of hip fractures.

Hip fracture patients have a relatively high perioperative mortality rate. Three-month postoperative mortality rates have been reported at approximately 20% and one-year mortality rate of approximately 30%.<sup>5</sup> This high perioperative mortality rate can be contributed to the debilitating condition created by the injury but also due to the fragility hip fracture patients in the elderly and the multiple pre-existing medical comorbidities. The fracture is often thought of as the 'tip of the iceberg;' conditions such as dementia, cardiac abnormalities, malnutrition, and altered sensorium can predicate the fall.

Time to definitive treatment of the fracture has been shown to significantly impact both mortality and morbidity. There is some debate in the literature about the ideal timing for surgery. Early intervention allows for pain relief, aids in hygiene and assists mobility. Most agree that earlier is better in patients not having a medical crisis and often less than 48 - 72 hours is listed as the threshold. Studies have shown that delay of greater than 72 hours leads to an increased hospital length of stay, increased rate of admission to skilled nursing facilities post-discharge, an increased rate of medical complications (decubitus ulcers, urinary tract infections, and delirium), and a possible increase in mortality rates.<sup>8,9</sup>

Care of this patient population is both medically complex and time sensitive. Numerous institutions have developed clinical pathways and multimodal approaches to management of these patients. These pathways focus on streamlining the patients care from admission to discharge. The system typically involves orthopedic surgery, hospitalists, geriatrics, anesthesiology, physical therapy/rehab, and nursing services. These pathways have been found to reduce the number of medical complications, reduce hospital length of stay, and in some reports, reduce the perioperative mortality rates.<sup>6,7</sup> Regional anesthesia can also play a very important role in pain control perioperatively and has been shown to decrease narcotic use.<sup>12</sup>

Hip fractures are typically treated surgically with one of two methods: internal fixation or hip arthroplasty. The goals of surgical management are to safely and efficiently perform intervention in a timely manner and allow for immediate weight bearing.

The goals for the patient after surgery are: 1) **Pain control**, 2) **Enable peroneal hygiene**, and 3) **Restore function**. An unstable hip fracture is an extremely painful condition. This constant and debilitating pain adversely affects the patient's quality of life. Because of pain, it becomes extremely difficult to roll or transfer in bed. This leads to the patient lying in the supine position for prolonged periods of time, placing the patient at high risk for developing decubitus ulcers. It is also painful to perform transfers to a chair or to sit upright. The constant supine position also places the patient at risk for aspiration, pneumonia, and pulmonary compromise. Even for patients at the end of life, surgery care sometimes is advocated as palliative care in its own right.

A hip fracture also leads to a decreased and painful range of motion of the hip. As a result, it leads to patients having extreme difficulty using bedside commodes or bed pans, making it extremely difficult to perform perineal hygiene. Inability to use bed pans or commodes leads to more prolonged use of indwelling urinary catheters which has been shown to increase the rates of urinary tract infections; placing additional physiologic stress on an already fragile patient.

Surgical fixation or arthroplasty allows the patients to begin mobilizing almost immediately after surgery by stabilizing the fracture site. Surgery allows for improved pain in the acute setting, allowing the patient and health care providers to roll and shift in bed and for the nursing staff to more easily perform decubitus ulcer prophylaxis measures. It also allows for easier transfers to chairs, bedside commodes, and use of bedpans, further assisting in the prevention of decubitus ulcer formation and allowing for peroneal hygiene to be performed more easily and comfortably facilitating the discontinuation of urinary

catheters. Finally, surgery improves the chances of the hip fracture patient being able to ambulate by providing a stable limb to weight bear on, allowing the patient to begin physiotherapy guided sessions to regain ambulation.<sup>10</sup>

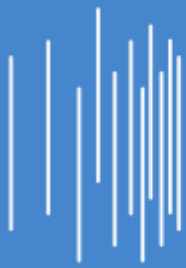
The ability for a patient to perform transfers, weight bear on the affected lower limb, and ambulate is paramount for the patient being able to regain independence. If the patient is unable to perform these activities to some degree, the patient becomes dependent on family members or health care providers to perform activities of daily living. As a result, these patients frequently have long stays in skilled nursing facilities or prolonged use of home health care services, which can place a large financial and social burden on the patient and/or family.

As with most things in medicine and life, surgery does not come without risks. Surgery is a stress to the body, and patients are at risk for cardiac strain leading to myocardial infarction, stroke or death. For those requiring general anesthesia, respiratory insufficiency leading to prolonged ventilation is also a concern. Non-operative management is generally reserved for only patients that are gravely ill and deemed medically unfit for surgery. A thoughtful conversation with the patient (if possible), family and care teams is needed. Despite this and for the reasons mentioned above, the non-operatively managed hip fracture patients have been found to have significantly longer hospital stays, greater rates of admission to skilled nursing facilities, greater rates of medical complications, and higher mortality rates when compared to their operative counterparts.<sup>10,13,14</sup> A recent publication investigated the cost-benefit of treating hip fractures surgically in the United States. The authors concluded that surgically treating hip fractures yielded a lifetime societal benefit of \$65-68,000 above direct medical costs per patient, equating to a \$16 billion national lifetime societal savings. The study found it was also still cost effective providing surgical treatment in patients over the age of 90.<sup>11</sup>

As we move forward, management of hip fractures will continue to be key health care challenge for our society. The health care system needs to continue efforts in prevention of osteoporotic fracture through preventative programs and medications. Health care systems will also need to develop multidisciplinary teams to provide efficiently and quality driven approaches to the management of this patient population. Finally, we operate on these patients to improve their quality of life. Surgical intervention creates a condition that improves the patient's pain, allows for easier peroneal hygiene, and creates a stable platform to perform transfers and ambulate.

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