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Perspectives

Recovery Strategies from the OR to Home

In This Issue

Younger men and the elderly account for the majority of cases of pelvic fractures. They are often devastating injuries that are associated with a number of complications that often require extensive rehabilitation. In this article, Ms. Foster describes types or classifications of pelvic fractures, associated intra- and extrapelvic injuries and complications, and management strategies across the continuum of emergency care and rehabilitation. Most people with pelvic fractures survive their injury; death is usually due to concomitant injuries. Control of hemorrhage, infection, diagnosis and management of related injuries, early fixation of fractures, and early initiation of rehabilitation are critical to better functional outcomes for patients with pelvic fractures.

The challenge of surgery in the overweight patient lies in the special care and knowledge that are required for successful preoperative, intraoperative, and postoperative management. Obesity is associated with numerous coexisting conditions, such as diabetes, hypertension, soft-tissue infection, some cancers, and impaired circulation, which could interfere with the patient's general health. Ms. Gallagher, an expert the field of bariatrics, points out that the care of the morbidly obese patient requires an interdisciplinary approach. Her article examines the meaning of obesity, demographics, and factors that place this patient at particular risk during surgery. Preoperative, intraoperative, and postoperative care are discussed. Home-care needs are reviewed, as the patient moves from the hospital to home-care setting.

Pelvic Fractures: Emergency Care to Rehabilitation

continuing education for nursing

By Jan Foster, PhD(c), RN, CCRN

Pelvic fractures are devastating injuries that are associated with a number of complications that often require extensive rehabilitation. Pelvic fractures represent about 0.3% to 6% of all fractures and occur in 20% of all polytrauma cases.[1] High-velocity trauma accounts for most pelvic fractures, including motor vehicle accidents, motor vehicle-pedestrian accidents, crush injuries, and falls.[2] A bimodal distribution of age is seen in pelvic trauma, as most injuries occur between the ages of 15 to 30 and 50 to 70 years. The overall average age is reportedly 31.5 years. Men account for more pelvic fractures than women, representing about 57% to 75% of all pelvic injuries.[1-4] Reported mortality rates range from 6.4% to 30%,[5] depending on the type of pelvic fracture and extrapelvic injuries and complications.

Rapid assessment and diagnosis during the emergent period, along with rehabilitation that begins as soon as the individual stabilizes, are vital to good outcomes. This article will describe types of pelvic fractures, associated intra- and extrapelvic injuries and complications, and management strategies across the continuum of emergency care and rehabilitation.

Pelvic Anatomy

Three major bones compose the pelvis: ilium, ischium, and pubis. The ilium is situated superiorly. The uppermost portion forms the iliac crest. The right and left ilium form the pelvic girdle and articulate with the sacrum posteriorly to form the sacroiliac joint. The ischium lies inferiorly and posteriorly. The superior and inferior rami join the pubis, which lies inferiorly and anteriorly. Eventually, the three bones fuse into one at the acetabulum, which forms a socket for the head of the femur. Anterior fusion of the right and left pubi form the symphysis pubis. The circumference of the pelvic brim is shaped by the oblique plane across the sacrum on the posterior side, symphysis pubis on the anterior side, and several lateral points along the ilium. The greater pelvis, sometimes called the false pelvis, lies above this landmark. Its borders include the lumbar vertebrae, ilium laterally, and abdominal wall anteriorly. The lesser or true pelvis is below the pelvic brim, bounded by the sacrum and coccyx, inferior portions of the ilium and ischium, and pubic bones (Figure 1).[6]

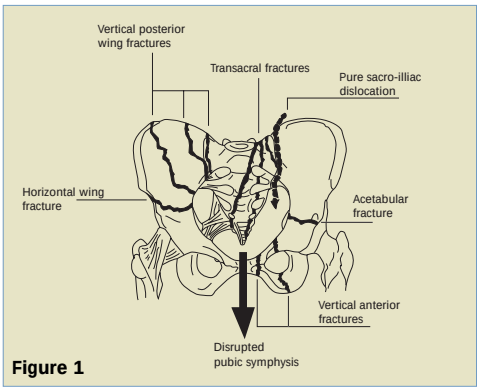

Figure 1

The pelvis houses several large vascular structures. The common iliac artery branches

Continued on page 4

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Postoperative Care of the Bariatric Patient

By Susan Gallagher RN, MSN, MA, CNS, CWOCN, PhD

The challenge of surgery in the overweight patient lies in the special care and knowledge that are required for successful preoperative, intraoperative, and postoperative management. Some authors believe that, from the onset, the obese patient is at a surgical disadvantage, because differential diagnosis is difficult, anesthesia is more troublesome, and technical procedures are more complicated.[1]

Obesity is associated with numerous coexisting conditions, such as diabetes, hypertension, soft-tissue infection, some cancers, and impaired circulation, which could interfere with the patient's general health. Many surgeons are reluctant to perform surgery on obese patients because of the increased rise of surgery-related complications. Many hospitals report concerns because of inadequate equipment and personnel to accommodate the needs of obese patients. It is true that obesity could be associated with more complications; however, recent advances in surgery, particularly in obese patients, have helped to reduce some of these risks.[1]

Clinical care of the morbidly obese patient requires an interdisciplinary approach. The entire healthcare team must be diligent in caring for the morbidly obese, surgical patient. Being aware of possible complications and corresponding interventions is necessary to prevent potential hazards to both patient and caregivers.

This article examines the meaning of obesity, demographics, and factors that place this patient at particular risk during surgery. Preoperative, intraoperative, and postoperative care are discussed. Home-care needs are reviewed, as the patient moves from the hospital to home-care setting.

Understanding Obesity

The word "obesity" itself holds a negative connotation. Despite this fact, obesity refers to a special condition that is recognized by the National Institutes of Health (NIH). Obesity, according to the NIH, is a diagnostic category that represents a complex and multifactorial disease.[2] Many obese Americans neither choose to be overweight nor choose to experience widespread prejudice and discrimination.[3] They certainly should not expect such behavior when they are seeking health care. Clinicians need to ensure a safe haven from obesity-related prejudice and discrimination.[4]

Prejudice and discrimination are widespread against the obese person. This prejudice is observed at a very young age. For example, 6-year-old children have described silhouettes of obese children as lazy, stupid, and ugly. According to this study, prejudice toward the obese child occurs regardless of race or socioeconomic status.[5] Children are not the only ones to hold a prejudice against the overweight person; healthcare clinicians often show this bias.[6] It is even observed among obese persons themselves.[7]

Healthcare clinicians best serve their patients when they recognize obesity as a chronic condition. Historically, obesity has been perceived as a problem of self-discipline. However, recent discoveries suggest that this is far from the truth. It is true that weight gain occurs when food intake exceeds energy output, i.e., activity, but the real mystery behind a balanced body weight depends on a number of other factors. Genetics, gender, physiology, biochemistry, and neuroscience as well as cultural, environmental, and psychosocial factors influence weight and its regulation.[8]

Demographics

Over 50% of Americans are overweight, and 10% to 15% are considered obese.[9] Americans spend close to $33 billion annually in attempts to control or lose weight, while $100 billion are spent on obesity-related health problems. Despite efforts at weight loss, Americans continue to gain weight. Some argue that obesity is reaching epidemic proportions. In the early 1960s, only a quarter of Americans were overweight. Today, over half of all adults and 25% of children are overweight.

Figure 1

Obesity has a physical, emotional, and economic impact on our patients. Obesity is a factor in five of the 10 leading causes of death.[10] It is considered the second most common cause of preventable deaths in the USA.[11] In addition to the physiologic costs, some authors argue that obesity is associated with emotional conditions, such as depression, altered self-esteem, and social isolation.[12] On the other hand, others argue that it is society's response to the obese person that leads to these emotional conditions.[13]

These factors, among others, influence heathcare delivery across practice settings.

Preoperative Assessment and Preparation

The preoperative period for the morbidly obese patient is a time of physical and emotional preparation. The nurse, as a member of the interdisciplinary healthcare team, usually spends the most time with the patient and is an important player in the patient's preoperative assessment and preparation. Like all patients, the very overweight patient needs comprehensive preoperative instruction, including breathing and coughing exercises and appropriate leg exercises.[14] Breathing and coughing exercises are especially important to review, as these exercises are useful in preventing atelectasis and congestion that can result from shallow respirations as a result of incisional pain, depressive analgesia, inactivity, and obesity itself.[15] Demonstrations of deep-breathing and coughing exercises should include splinting the surgical area and use of the incentive spirometer. The application of abdominal binders can also increase deep breathing. There are Velcro-type binders (Dale Medical) available in extra-long sizes of up to 75" in length and up to 15" in width.

Postoperatively, leg exercises are important to maintain proper circulation. These exercises prevent the stasis of blood, which could lead to deep-vein thrombosis. Teaching includes the demonstration of calf-pumping.[15]

Successful preoperative preparation includes the patient's family or other support personnel. An atmosphere of understanding, cooperation, and trust ensures a smoother postoperative course.

Intraoperative care

Although intraoperative care is a highly specialized process that is far too detailed to cover here, it is important to recognize some of the more common obesity-specific intraoperative activities and their rationale. It is also important to recognize some safety-oriented activities in the patient's intraoperative experience.

Most surgical procedures require two nurses, e.g., a scrub nurse and circulating nurse. In caring for obese patients, some hospitals add a third nurse, especially at the beginning of surgery. The third nurse may be

necessary for positioning. A task as simple as placing a catheter can be technically difficult and, as it is an unnecessary embarrassment to the patient, a nurse usually places the catheter once the patient has been properly sedated or anesthetized.[14]

Urinary catheters are used for several reasons. Assisting a female patient onto a bed pan postoperatively can be difficult for caregivers and uncomfortable for the patient. In addition, patients receiving an epidural catheter for pain control may require a urinary catheter because of associated urinary retention. Securing the foley catheter high on the patient's thigh with a foley catheter holder will significantly reduce the risk of tube dislodgement and thereby reduce the risk of UTI infection (Figure 1).

Another intervention of concern is the surgical scrub (preparation of the skin surface prior to surgery). The nurse must ensure that all areas are clean and painted vigorously. This can be especially difficult in the presence of deep-skin folds. A third nurse can help the circulating nurse to achieve this task.

Once the surgery is over, warm sheets and a clean gown are provided for the patient. It is best to plan ahead by having larger gowns available in the operating room, eliminating any last-minute embarrassment. Extra personnel may be required to place the patient onto a gurney or oversized bed for transfer to the hospital room, once recovery is complete. Recovery staff need to be notified that they will be receiving an obese patient to allow for any necessary preplanning. This step helps to prevent last-minute scrambling to find the tools that are essential for postoperative assessment. Standard-sized equipment, such as blood pressure cuffs, may be insufficient to accomplish simple assessment.

The patient may be discharged from the recovery room to either the intensive care unit or a general medical-surgery unit, depending on medical assessment or hospital policy.

Postoperative Care

Although the patient is usually awake and alert shortly after surgery, extra personnel may be required for the transfer to the appropriate postoperative unit. Routine monitoring of vital signs and physiologic progress that requires documentation includes blood pressure, pulse, quality and number of respirations per minute, temperature, coughing, and deep breathing.

Patients seem to breathe more easily when the bed is at 30° (semi-Fowler position), as this angle reduces the weight of abdominal adipose tissue that presses against the diaphragm.[16] The patient may need encouragement to perform leg exercises and breathing and coughing exercises. Providing the patient with an abdominal binder (Dale Medical) can encourage deep breathing and coughing as well as postoperative mobility (Figure 2)[6]. Early activity is encouraged, as it decreases the chances of immobility-related complications. In the acute setting, patients can experience complications related to immobility and physical dependence. Some patients will fail to progress postoperatively either because of surgical complications or a critical condition.

Clinicians need to be familiar with common obesity-related complications and modify care plans and clinical interventions to address or prevent them. For example, atypical pressure ulcers and respiratory problems are two immobility-related conditions that could prolong the postoperative course.[17]

Obese patients often present with atypical pressure ulcers. Pressure within skin folds can be sufficient to cause skin breakdown. Tubes and catheters burrow into skin folds, which can further erode the skin surface. Pressure from side rails and arm rests not designed to accommodate an obese person can cause pressure ulcers on the patient's hips. This atypical skin breakdown can be minimized by using properly sized equipment. The patient needs to be repositioned at least every two hours, as do tubes and catheters. Commercially available securing devices that can be opened and closed several times, and remain in place, will reduce the likelihood of skin necrosis. Tubes should be placed so that the patient does not rest on them. Tube/catheter holders may be helpful in this step.

Wound healing can be problematic in some obese patients. Wounds are prone to dehiscence. In addition, blood supply to fatty tissues may be insufficient to provide an adequate amount of oxygen and nutrients, which can interfere with wound healing. A delay in wound healing may occur if the patient has a diet that lacks essential vitamins and nutrients. Wound healing can also be delayed if the wound is within a skin fold, where excess moisture and bacteria can accumulate. Furthermore, excess body fat increases tension at wound edges.[4] To reduce the occurrence of abdominal wound separation, some clinicians use a surgical binder to support the area. The binder will need to be large enough to comfortably fit the patient. For example, the Dale Abdominal Binder can accommodate waist sizes of up to 94".

Figure 2

Morbidly obese patients tend to have pulmonary problems, particularly obesity hypoventilation syndrome (OHS) and sleep apnea. OHA is an acute respiratory condition in which the weight of fatty tissue on the rib cage and chest prevents the chest wall from expanding fully. Because patients are unable to breathe in and out fully, ventilatory insufficiency can occur.[17]

Sleep apnea occurs when the patient sleeps in the supine position. The weight of excess fatty tissue in the neck causes the throat to narrow, severely restricting or even cutting off breathing for seconds or even minutes at a time. Breathing can be made easier by keeping the patient in the semi-Fowlers position, which takes some of the pressure off the diaphragm for reasons described earlier. Mobilizing the patient as early as possible also helps. Sleep apnea is often managed at night with the use of a continuous positive airway pressure (CPAP) machine.[18]

If long-term ventilator support becomes necessary, performing a tracheostomy can be especially challenging if the trachea is buried deep within fatty tissue. A large wound may be needed to locate the trachea. This larger wound can lead to complications, such as bleeding, infection, or damage of the surrounding tissue. Postoperative tracheostomy care, therefore, includes steps to protect the peristomal skin and manage tracheostomy and wound drainage. To compound this dilemma, standard-sized tracheostomy tubes may be inadequate for use with patients with larger necks. In addition, narrow cloth tracheotomy ties can burrow deep within the folds of neck, further damaging the skin. The thicker or wider ties, such as Dale Tracheostomy Tube Holder, have been used by clinicians to prevent this sort of damage. The Dale holder is also available with an extension to a total of 25" in length.

Home-care Needs

In the home-care setting, obese patients often pose serious management problems related to obesity itself as well as associated comorbidities. Planning and providing care to obese patients can be challenging. Not all obese patients will require special accommodation at home; however, patients who have limited mobility are likely to have special needs

Continued on page 7

Pelvic Fractures: Emergency Care to Rehabilitation — Continued from page 1

off the abdominal aorta. The internal iliac artery branches off the common iliac and supplies most of the blood supply to the pelvic wall and viscera via several tributaries, including the superior vesicle, obturator, rectal, uterine, vaginal, pudendal, and superior and inferior gluteal arteries. The external iliac artery traverses the brim of the lesser pelvis then becomes the femoral artery as the vessel passes through the leg. The lumbar and sacral arteries, which divide off the aorta, also lie in the pelvic cavity. The veins in the pelvis, for the most part, correspond to the arteries. The internal and external iliac veins fuse to form the common iliac vein. The internal iliac vein receives blood from the pelvic organs, including the uterus, vagina, urinary bladder, rectum, prostate gland, and vas deferens as well as blood from the medial thigh and gluteal muscles. The external iliac vein continues off the femoral vein and empties blood from the anterior abdominal wall and lower extremities.[6]

Other vital structures within the pelvis include the reproductive organs, sigmoid colon and rectum, bladder, ureters, and urethra. Important nervous system structures that traverse the pelvis include the sacral plexus, which is composed of the 4th and 5th lumbar nerves and sacral nerves 1 through 3. Also, the femoral, sciatic, and obturator nerves pass through the pelvis.[6]

Classification of Pelvic Fractures

Pelvic fractures are classified in several ways. The simplest method evaluates the nature of a pelvic-ring fracture and presence of an acetabular fracture. The pelvic-ring fracture is classified as anteroposterior compression, vertical shear, or lateral compression.[7] Pelvic-ring stability is a second method. Because anterior structures, such as the symphysis pubis and pubic rami, provide about 40% of pelvic rigidity, this classification system is based on posterior stability at the sacroiliac fusion. In Type A fractures, the pelvic ring is stable. Gansslen and colleagues[1] reported that, of 3260 pelvic injuries, 54.8% were Type A fractures. Ninety-one percent of Type A fractures affected the anterior pelvic or iliac rim. Type B fractures are rotationally unstable. Lateral compression and complete separation at the symphysis pubis ("open-book" fractures) account for most Type B injuries and are caused by internal and external rotational forces. Concomitant acetabular fractures are commonly associated with Type B fractures.[1] In Type C injuries, the posterior sacroiliac articulation is completely disrupted. Seventy percent to 80% of all pelvic fractures are Type A and B (Table 1).[8]

Table 1. **Classification of Fractures**[8]

Type	Pelvic ring	Percentage of injuries (%)
A	Stable	54.8
B	Partially stable Rotationally unstable "Open book" "Bucket handle"	24.7
C	Unstable Disruption of sacroiliac joint	20.5

Communication with adjacent tissue forms the basis for a third approach to the classification of pelvic injuries. Reportedly 2.7% of all pelvic fractures are open fractures.[2] Although relatively rare, they are associated with much higher morbidity and mortality than closed fractures. Open fractures most commonly result from motor-vehicle crashes. In one study, more individuals with open fractures were injured on a motorcycle (27% vs. 6%, $p < 0.001$), were about 9 years younger (30 vs. 39, $p < 0.001$), and were more likely to be male (75% vs. 57%, $p < 0.02$), when compared to people with closed pelvic fractures.[4] Bilateral pubic rami fractures account for most open fractures.[9] Open fractures are classified as Zone I, II, or III. In Zone I fractures, communication is between the perineum, anterior pubis, medial buttock, or posterior sacrum. Zone II injuries involve the medial thigh or groin crease. Zone III injuries include communication with the posterolateral buttock or iliac crest. The most frequent type of open fractures are Zone I injuries.[4] Many experts recommend a temporary diverting colostomy for this type of injury to reduce the risk of fecal contamination and infectious complications.

Associated Injuries and Complications

Most pelvic trauma deaths are due to associated injuries and complications rather than the pelvic fracture itself. They increase mortality from 10.8% to 31.1%.[1] In addition to increased mortality, associated injuries and complications account for greater blood transfusion requirements, longer hospital stays, and, predictably, increased costs of care.[3] Concomitant injuries can be intrapelvic or extrapelvic in nature and include intraabdominal and pelvic organ trauma, vascular injury, head injury and other neurologic injury, and other fractures. Complications during the emergent phase of trauma and hospitalization contribute to increased morbidity and mortality. Hemorrhage is the most common complication during the immediate period, whereas sepsis and multiorgan dysfunction syndrome (MODS) account for most deaths within two weeks after injury.[2,10]

Abdominal and pelvic visceral injuries

Abdominal and pelvic organs often injured include the diaphragm, spleen, liver, intestine, bladder, and urethra.[9,10] Injuries to the ovaries, labia majora, anus, and rectum are also reported.[2] These injuries generally require immediate diagnosis, control of hemorrhage, and surgical or radiological repair. [9,10]

Coagulopathy and vascular injury

Hemorrhage is the most significant problem associated with pelvic fracture. However, only a few individuals have osseous bleeding as a source of hemodynamic instability. Instead, hemorrhage results from intraabdominal and pelvic visceral-organ trauma and injured vasculature structures contained in the pelvis. Angiography to determine vessel injury is recommended in the presence of hypotension and hemodynamic instability when peritoneal lavage is negative for bleeding from the spleen, liver, and other intraabdominal structures. In one study, 65% of unstable patients with known pelvic fractures had pelvic-vessel injury on angiography.[11] In another report, angiography in 35 subjects revealed that 57% had multiple bleeding sites. Damage to the internal iliac artery and its branches was associated with unstable posterior pelvic fractures, whereas pudendal or obturator artery bleeding was associated with lateral compression fractures.[12] Management of hemorrhage includes aggressive fluid resuscitation, transfusions of packed red blood cells and platelets, and fresh frozen plasma and cryoprecipitate to replace clotting factors.[2] When hemorrhage is due to a damaged artery, embolization is sometimes used to avert bleeding, making angiography useful not only as a diagnostic tool but as a therapeutic intervention.[10]

Neurologic injuries

Because pelvic fractures generally result from high-impact trauma, people often sustain open or closed head injuries during the crash. Death due to head injury usually occurs early after impact.[3] If the patient survives, stabilization of intracerebral hemorrhage and increased intracranial pressure, however, take priority over repair of the pelvic fracture, which may be delayed for days or weeks. Other neurologic injuries, i.e., spinal-cord, spinal nerve-root, and sciatic-nerve injuries, occur most often with unstable pelvic-ring fractures. In a study of 83 subjects with unstable pelvic-rim fractures, 21% sustained nerve damage. Thirty-seven percent of those had only sensory deficits, whereas 63% suffered both sensory and motor deficits. Early reduction and stabilization of unstable pelvic-ring fractures contribute to faster recovery and better prognoses. However, people with injuries at L5 are less likely to gain full function.[13]

Extrapelvic fractures

It is unlikely for bones outside of the pelvis to escape injury when trauma results from motor-vehicle crashes and high-impact falls. Other fractures include bones of the upper and lower extremities, vertebrae, face, skull, sacrum, and ribs.[2]

Complications

People with unstable pelvic fractures are more likely to have complications than those with stable fractures.[3] In a study of 236 patients with pelvic fractures, 77 (32.6%) developed 137 complications.[3] The most common complications included thromboembolic events, infection, and pulmonary complications.

Thromboembolic complications

Thromboembolic events are the most common avoidable causes of morbidity and mortality in trauma patients. Deep-vein thrombosis (DVT) occurs in 35% to 60% of patients with pelvic trauma and pulmonary embolism in 2% to 10%, with a mortality of 0.5% to 4%.[14] The three factors leading to thrombosis and pulmonary emboli are endothelial damage, venous stasis, and hypercoagulability. All three present with pelvic fractures. There is direct injury to the pelvic veins, release of vasoactive mediators that cause venous distention, and prolonged periods of immobility and venous stasis. Both proximal thrombosis and DVT are associated with pulmonary emboli. In proximal thrombosis, thrombi most often develop in the external and iliac veins, whereas DVT involves more distal branches in the legs.

Prophylaxis of DVT is key to preventing pulmonary emboli. Standard measures include subcutaneous heparin or low-molecular-weight heparins, pneumatic compression devices on the lower extremities, and adequate hydration.[14] Routine screening with Doppler ultrasound and placement of vena caval filters are sometimes used to prevent pulmonary emboli. Treatment options for DVT and pulmonary emboli are somewhat limited, especially for the person with an associated intracerebral or uncontrollable hemorrhage in the chest, abdomen, pelvis, or retroperitoneum. Continuous intravenous infusion of heparin or subcutaneous injections of low-molecular-weight heparin are the treatments of choice. Vena caval filters are used in those for whom aggressive anticoagulation is contraindicated.[14] Thrombolytic therapy for pulmonary embolism remains controversial.[15]

Infection

Various sources of infection are associated with pelvic trauma, including perineal wound infection and abscess, osteomyelitis, pneumonia, urinary tract infection, muscle and skin necrosis, fungemia, and sepsis. Infectious complications often lead to MODS, necessitating a prolonged stay in the intensive care unit. Management of focal wound infections includes repeated operative debridement, wound irrigation, split thickness skin grafts, and diverting colostomy to prevent fecal contamination. Broad-spectrum, systemic antibiotics and antifungal agents are indicated for other infectious sources. Antibiotics are adjusted according to culture results.[2,4]

Pulmonary complications

Pulmonary complications are often associated with pelvic injuries. Pneumothorax should be suspected with concomitant rib fractures. Adult respiratory distress syndrome results from aspiration during the resuscitative phase of injury, pneumonia that develops later, or a septic or systemic inflammatory response.[3] Chest tubes, mechanical ventilation, anti-infective agents, careful management of fluids, and nutritional support are important aspects of care for pulmonary complications that accompany pelvic trauma.[2]

Long-term outcomes

Achieving desired outcomes for patients with pelvic fractures requires an aggressive, multidisciplinary approach throughout the continuum of care after injury. People with open fractures experience the most complications and have the greatest rehabilitation needs. Overall, they have a poorer recovery rate than those with closed fractures. Chronic disability, impaired role performance, and poor physical function is reported.[4] Less often, long-term complications may include fecal and urinary incontinence, impotence, dyspareunia, and non-healing fractures.[2]

For people with closed fractures, early fixation is recommended, if possible. Fixation of acetabular fractures within 24 hours of injury has demonstrated a lower incidence of MODS ($p < 0.006$) and decreased length of hospital stay ($p < 0.026$). Patients are more likely to be discharged home rather than to rehabilitation or skilled care ($p < 0.05$) and have greater functional outcomes and improved mobility.[10] In a study of unstable pelvic-ring fractures repaired with open reduction and internal fixation, 76% of patients returned to work, 62% full-time. Sickness Impact Profile Scores (SIP) at one year after injury indicated that 77% of these patients had only a mild disability, while 23% had a moderate disability.[16] These patients were allowed no weight-bearing for 3 months and required aggressive rehabilitation and assistance with activities of daily living.

Management

Management of pelvic trauma begins with careful evaluation by emergency personnel of the circumstances surrounding the event. A number of essential facts should be determined initially, e.g., the type of incident, on which side of the vehicle the individual was sitting during a motor-vehicle accident, and the speed of impact. Answers to these questions will direct appropriate diagnostic testing and rapid intervention. Full-body X-rays, blood chemistries, determination of hemoglobin, hematocrit, and platelets, coagulation studies, and urinalysis should be done to evaluate bleeding and organ injury. Other helpful diagnostic tests are peritoneal lavage and computed tomography scans.[2,10] Emergency management includes efforts to control hemorrhage and support hemodynamic stability. Administration of fluids and blood products should be aggressive. Angiography and possibly embolization are indicated if bleeding remains uncontrolled. Broad-spectrum antibiotics should be initiated. Orthopedic consultation and other appropriate specialists should be notified immediately. Pelvic fractures should be stabilized and fixed as early as hemodynamic and neurologic stability allows.

Fracture stabilization

Patients who sustain pelvic fractures fall into one of two categories: those who stabilize after initial fluid resuscitation and the administration of blood products; and those who fail to respond to resuscitative efforts and remain hemodynamically unstable. Patients in the first group are managed with elective orthopedic surgery in 2 to 3 days after the injury. Stable pelvic fractures are treated with bed rest, until the patient's overall condition allows ambulation. Weight bearing may begin early in the recovery period.[17] Repair of unstable fractures is determined by location of the fracture, i.e., whether it is anterior or posterior. Anterior fractures can be repaired by using an external or internal approach. Injuries involving separation of the symphysis pubis or open-book fractures may be reduced and stabilized by "closing the book" with an anterior external fixation frame, which is positioned around the pelvis and held in place with pins on either side. Anterior external fixation can usually be done at the bedside under local anesthesia. Internal repair is accomplished with plates and screws, which requires general anesthesia. Unstable posterior pelvic fractures are more complex, with multiple combinations of injuries involving different bony structures in the posterior pelvis. Fracture dislocation requires open reduction and correction of bone misalignment under general anesthesia, followed by a variety of plate-and-screw fixation techniques for stabilization.[17]

Patients in the second category are seldom candidates for acute internal fixation. Management priorities include restoration of hemodynamic stability through angiographic embolization, laparotomy to explore and repair sources of bleeding, and external pelvic-fracture fixation. External fixation helps to control hemorrhage by reducing the volume of the pelvis, providing a tamponade effect on deep hemorrhage within the pelvis, and promote clotting.[17]

Open fractures are the most devastating and present the greatest challenge to the trauma team. The patient should go immediately to the operating room for exploration, control of bleeding, and repair of soft-tissue injuries.[17] A diverting colostomy may be done at this time to prevent stool contamination of the pelvis and subsequent sepsis.

Nursing Care

Emergency and critical-care nurses need to be skillful in their assessment of hemodynamic monitoring, determinations of organ perfusion and oxygenation, and knowledgeable about coagulopathy, blood-product administration, and signs of hypovolemic and septic shock. Expert care of the many concomitant injuries and multisystem complications is vital to recovery in the immediate phase after injury.[18] In addition, several needs specific to pelvic injury warrant close attention during this time.

Anterior external fixation devices remain in place for about 6 to 8 weeks. Pins and insertion sites require frequent cleaning to prevent infection. After open fracture repair, daily wound debridement and irrigation in the operating room is recommended for at least 4 days. Frequent dressing changes in the intensive care unit are important to reduce the risk of sepsis.[17] The dressing may be held in place with an abdominal binder, as there will generally be an open, gaping wound, making it otherwise difficult to secure the dressings. The abdominal binder may also facilitate coughing and deep breathing and promote greater patient movement, which will help to prevent pneumonia. Tissue integrity of the colostomy should be assessed frequently due to the risk of compromised blood flow during the initial injury. A colostomy bag should be secured over the stoma with skin-protective sealant. Urinary output, an important indicator of intravascular volume and organ perfusion, should be monitored closely. Hematuria should be noted, as it may signify renal or bladder injury. The urinary catheter should be stabilized with a catheter-securing device to prevent further trauma to the urinary meatus and bladder.

Pain management is a high priority during this time, as orthopedic injury is one of the most severe types of pain. Continuous intravenous infusion of pain medication provides a steady blood level and is generally more effective in maintaining analgesia at lower overall doses.[18,19]

The patient is at risk for complications due to immobility during this relative time of prolonged bed rest, which is potentiated by poor tissue perfusion during the emergent phase of injury. The use of therapeutic beds, early provision of parenteral or enteral nutrition, and pneumatic-compression devices help to prevent skin breakdown and deep-vein thrombosis, respectively. Intravenous catheters and enteral feeding tubes should be secured. A bendable armboard with soft material covering can assist in securing the catheter while minimizing skin damage. Frequent site assessment and dressing changes are necessary to prevent infection. Bowel elimination is achieved with stool softeners, particularly when the patient receives high doses of narcotic for pain management.[19] Once the patient is well stabilized, wound healing, oral nutrition, physical therapy, and general conditioning become the main concerns.

Conclusions

Most people with pelvic fractures survive their injury. If not, death is usually due to concomitant injuries. Control of hemorrhage, infection, diagnosis and management of related injuries, early fixation of fractures, and early initiation of rehabilitation are critical to better functional outcomes for patients with pelvic fractures. Patients suffering pelvic injury require a coordinated effort by numerous healthcare professionals throughout the trajectory of care, beginning with the trauma team in the field, continuing with the rehabilitation team to discharge, and beyond, as outpatient rehabilitation continues for weeks or months. With early intervention and prevention of problems through collaborative efforts, patients with pelvic fractures can achieve optimal functional outcomes and return to the community.

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Postoperative Care of the Bariatric Patient — Continued from page 3

and therefore require special accommodation.

In a recent study, nurses reported five specific challenges in the home-care setting: equipment, reimbursement, access to resources, client motivation, and family/significant other support.[19] The challenges cited most often involved specialized-equipment issues.

Many healthcare providers complain of the inability to turn, transfer, or lift heavier patients, which can lead to immobility-related concerns.[20] Family members and caregivers may be at risk for injury when caring for the obese patient in the home, as fewer personnel are available to help. Oversized wheelchairs and walkers with greater weight limitations than standard equipment are readily available for purchase or rent in major medical supply centers. Both items promote independence and dignity. Equipment that nurses find most helpful in the home are the wheelchair, walker, commode, electronically-controlled bed frame, support surface, and lift.

When planning for oversized equipment in the home, consider weight limits, width, and electrical needs. In other words, does the patient have a sliding glass door or extra wide doorway through which equipment can be delivered? Or, will the equipment collapse, so that it can be delivered through a standard-sized doorway?

Conclusion

With obesity on the rise, clinicians best serve patient care by employing strategies to reduce or prevent costly complications. Although equipment is a helpful adjunct to care, it is never a substitute. Numerous resources are available to clinicians across practice settings, and use of resources in a timely and appropriate manner are thought to improve measurable therapeutic, cost, and satisfaction outcomes.

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2. List two (2) methods of classifications of pelvic fractures.
3. Discuss how complications during the emergent phase of trauma and hospitalization can contribute to increased morbidity.
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1. Pelvic trauma most commonly occurs during which age group?

A. 15 to 30 years
B. 31 to 57 years
C. Preschool
D. Elderly

2. The most common causes of pelvic fracture include:

A. Snow and water skiing accidents
B. Falls on ice
C. Falls out of bed
D. Motor vehicle and motor vehicle-pedestrian accidents

3. Most people with pelvic fracture die from:

A. Osteomyelitis
B. Bleeding from the fracture
C. Concomitant injuries
D. Pelvic instability

4. During the emergent phase following pelvic injury, the nurse should closely assess the patient for:

A. DVT and pulmonary embolism
B. Pneumonia and atelectasis
C. Brain and spinal cord injury
D. Sepsis and systemic inflammatory response syndrome

5. Management priorities early after an open pelvic fracture include:

A. Internal stabilization of the fracture
B. Hemodynamic monitoring and administration of blood products
C. Wound irrigation and debridement
D. Colostomy care

6. Which are the most important nursing interventions when injury to pelvic organs is suspected?

A. Stabilization of the urinary catheter and assessment for hematuria
B. Bowel cleansing enemas and stool guiac check
C. Internal or external fracture stabilization
D. Withholding analgesia to enable accurate neurovascular checks

7. What is the simplest treatment approach for anterior, "open-book" fractures?

A. Internal plates and screws
B. Early ambulation
C. External traction
D. External fixation frame and pins

8. The most favorable outcomes for patients with stable pelvic fractures are achieved by:

A. Maintaining bedrest until the fracture is fully healed
B. Initiating physical therapy on discharge
C. Early weight-bearing following overall condition stabilization
D. Passive range of motion exercises

9. Measure(s to prevent focal infection include:

A. Securing the colostomy bag over the stoma
B. Daily wound irrigation and debridement in the operating room
C. Using an abdominal binder to hold the dressings in place
D. All of the above

10. Fixation of acetabular fractures within 24 hours results in greater functional outcomes and improved mobility.

A. True
B. False

Mark your answers with an X in the box next to the correct answer

	A	B	C	D
1	☐	☐	☐	☐
2	☐	☐	☐	☐
3	☐	☐	☐	☐
4	☐	☐	☐	☐
5	☐	☐	☐	☐
6	☐	☐	☐	☐
7	☐	☐	☐	☐
8	☐	☐	☐	☐
9	☐	☐	☐	☐
10	☐	☐	☐	☐

Participant's Evaluation

1. What is the highest degree you have earned? 1. Diploma 2. Associate 3. Bachelor's 4. Master's 5. Doctorate

Using 1 =Strongly disagree to 6= Strongly agree rating scale, please circle the number that best reflects the extent of your agreement to each statement.

	Strongly Disagree					Strongly Agree
2. Indicate to what degree you met the objectives for this program:						
■ Identify three (3) complications associated with unstable pelvic fractures.	1	2	3	4	5	6
■ List two (2) methods of classifications of pelvic fractures.	1	2	3	4	5	6
■ Discuss how complications during emergent phase of trauma and hospitalization can contribute to increased morbidity.	1	2	3	4	5	6
■ Explain how a multi-disciplanary approach to the management of pelvic fractures can improve long-term outcomes.	1	2	3	4	5	6

3. Have you used home study in the past? ■ Yes ■ No
4. How many home-study courses do you typically use per year? _____
5. What is your preferred format? ■ video ■ audio-cassette ■ written ■ combination
6. What other areas would you like to cover through home study? _____

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