

Pelvic Fractures—Preventing Complications

Pelvic fractures are serious injuries that can be associated with a high mortality rate. Key to ED management is stabilizing the patient, diagnosing and prioritizing injuries that are an immediate threat to the patient's life, and consulting with specialists from other departments to determine a treatment plan.

Hina Zafar Ghory, MD, and Rahul Sharma, MD, MBA, FACEP

Representing about 3% of all skeletal fractures,¹ pelvic fractures are typically minor injuries (up to 95%).² However, the spectrum ranges from simple pubic rami fractures after minor falls to complex disruptions in the pelvic ring following major trauma.² Severe pelvic fractures result from high-force mechanisms and have a high incidence of concurrent injuries to other organ systems. Mortality from pelvic fractures ranges from 10% to 50% in adults, depending on the severity of the fracture and associated injuries; it reaches 5% in pediatric patients.^{3,4,5} The overall mortality increases to 50% if the patient is hypotensive on arrival to the ED.³ Open fractures, occurring in 4% to 5% of cases, are associated with a mortality rate of up to 70%.^{3,4}

Mortality from pelvic fractures is usually secondary to massive retroperitoneal hemorrhage, ensuing infection, or associated injuries. Long-term morbidity (including sexual dysfunction, dyspareunia, and incontinence) results from neurologic, gastrointestinal, and urogenital injury. Through early recognition, diagnosis, and management, the emergency physician has a critical role in minimizing and possibly preventing these complications.

MECHANISM OF INJURY

The major causes of pelvic fractures in adults include motor vehicle crashes (50% to 60%), motorcycle col-

lisions (10% to 20%), pedestrian/motor vehicle accidents (10% to 20%), falls (8% to 10%), and crush injuries (3% to 6%).^{2,6} Falls in the elderly commonly result in pubic rami fractures with an intact pelvic ring. With the rising percentage of elderly patients in the United States, the number of pelvic fractures secondary to falls is likely to increase.

Pediatric pelvic fractures are commonly secondary to pedestrian/motor vehicle accidents (60% to 80%), followed by motor vehicle crashes (20% to 30%).²

ANATOMY

The pelvis is made up of the sacrum, the coccyx, and two innominate bones, which are formed by the fusion of the embryonic ilium, ischium, and pubis. The sacrum and innominate bones form the pelvic ring, which hosts five joints facilitating support and movement: the lumbosacral, sacroiliac (SI), sacro-coccygeal, the pubic symphysis, and the ball-and-socket joint of the acetabulum. Several ligaments, including the dorsal and ventral SI ligaments, the sacrotuberous ligaments, and the sacrospinous ligaments, stabilize the pelvic ring. The integrity of the pelvic ring is intimately tied to the strength of these ligaments. The interosseous SI ligaments are the strongest in the body, while the pubic symphysis is the weakest joint of the pelvis and often the first to be disrupted in trauma.^{4,6}

An intricate network of blood vessels surrounds the pelvis. Included are the median sacral artery, the superior rectal artery, and the common iliac artery, which divides into the external and internal iliac arteries. The iliac arterial and venous trunks pass ventrally to the SI joints bilaterally. Disruption of

Dr. Ghory is chief resident in the department of emergency medicine at NewYork-Presbyterian/Weill Cornell Medical Center in New York City. **Dr. Sharma** is an attending physician and assistant director for operations in the department of emergency medicine at NewYork-Presbyterian/Weill Cornell Medical Center.

these joints risks rupture of and hemorrhage from the associated vessels, especially the internal iliac arteries. Injury to the external iliac arteries may be seen in acetabular fractures secondary to protrusion of the femoral head into the pelvis.

The most common mechanism of bleeding in pelvic fractures is bone edge laceration of small- and medium-sized veins. This hemorrhage is usually controlled by self-tamponade as blood builds up in the pelvic retroperitoneal space. In 10% to 15% of patients with an unstable pelvic fracture, the bleeding is arterial, and death is secondary to arterial lacerations that are not conducive to tamponade.¹ The superior gluteal and pudendal arteries are most commonly involved. Patients older than 55 to 60 years are more likely to have arterial bleeding in pelvic fractures than are younger patients.^{3,4}

Compared with older patients, pediatric patients usually experience less dramatic bleeding from pelvic fractures. When bleeding does occur, it usually results from injury to distal solid organs. Nevertheless, 17% to 46% of pediatric patients with pelvic trauma require blood transfusions.⁵

The pelvis receives its nerve supply through the lumbar and sacral plexuses. Nerve root or peripheral nerve injuries can be seen in pelvic fractures secondary to traction or pressure secondary to bony fragments or hemorrhage. Sciatic nerve injury is commonly seen with acetabular fractures. SI joint dislocation can lead to lumbar root injuries and sacral fractures; in particular, fractures involving S1 and S2 vertebrae can lead to sacral root injuries. Neurologic injury can be seen in up to 25% of cases of sacral fractures.⁷

As the pelvis is closely associated with the genitourinary and gastrointestinal tracts, these systems are vulnerable to injury from pelvic fractures. The bladder and urethra are immediately posterior to the pubic symphysis, while the rectum is located immediately ventral to the sacrum. As a result, injuries to the bladder and urethra are seen in 15% to 20% of pelvic fractures; however, signs and symptoms may not be obvious immediately after the injury.^{4,8} Bladder injuries are more commonly seen in lateral compression fractures, while urethral injuries can be seen in both lateral and anterior compression injuries. Rectal injuries are less common and are associated with urinary tract injuries and ischial fractures.

Depending on the mechanism of the pelvic fracture, injuries to distant organ systems may be seen.

For instance, pelvic fractures can be associated with closed head injury in up to 50% of cases and thoracic injury in 21% of cases.⁹

As the pelvis is more stable in pediatric patients than in adults, a fracture in a child or adolescent implies an even stronger mechanism of injury. The pediatric pelvis is also shallower, making the abdominal and pelvic viscera more susceptible to injury. The rate of concomitant injuries in pediatric patients with pelvic fractures ranges from 70% to 80%, with damage to the orthopedic (62%), neurologic (54%), vascular (39%), pulmonary (31%), and genitourinary (15%) systems most common.⁵

CLASSIFICATION

Although several classification schemes have been developed to describe the different types of pelvic fractures, they have limited applicability to the ED, where the key questions are often simple: Is there a fracture? If so, is it stable or unstable? Study findings differ concerning the most accurate predictor of mortality in pelvic fractures, but the major contributing factors include the injury severity score, severity of fracture, and the presence on CT of active arterial bleeding requiring angiography or embolization.

Judet-Letournel Classification

Elemental acetabular fractures are classified according to the Judet-Letournel scheme as *posterior wall*, *posterior column*, *anterior wall*, *anterior column*, and *transverse acetabular fractures* (Table 1).¹⁰ Combinations of any of these fractures are classified as *combined acetabular fractures*. Ninety percent of acetabular fractures are both-column, transverse, or posterior wall fractures.¹¹ Acetabular fractures usually occur when the acetabular socket is disrupted secondary to the femur being driven backward into the hip (eg, as in a dashboard injury in a motor vehicle collision or when the hip is struck laterally in a pedestrian/motor vehicle accident). Associated hip dislocations are common.

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Young-Burgess Classification

Of the numerous schemes used to classify pelvic fractures that disrupt the pelvic ring, the Young-Burgess

TABLE 1. Judet-Letournel Classification of Acetabular Fractures and Associated Injuries

Fracture	Mechanism	Description	Associated injuries
Posterior wall	Direct trauma to flexed hip and knee	Fractured acetabulum	Sciatic nerve injury, femoral fractures
Posterior column	Posteriorly directed force to abducted, flexed leg	Fractured acetabulum through obturator foramen with ischial ring disruption	Sciatic nerve injury, inability to bear weight
Anterior wall	Lateral force to the greater trochanter with hip externally rotated	Fracture extends from the anterior inferior iliac spine to superior ramus with a disrupted ischial ring and iliopectineal line	Inability to bear weight
Anterior column	Posterior force to knee with hip abducted and flexed	Fracture from pubic ramus through iliac crest with disruption of the ischial ring and iliopectineal line	Inability to bear weight
Transverse acetabular	Force lateral to medial over greater trochanter	Fracture extends anterior to posterior through acetabulum with an intact ischial ring	Sciatic nerve injury

Adapted from Steele and Ellison.¹⁰

scheme, based on the mechanism of injury, is the most widely used (Tables 2 and 3).¹⁰ According to this classification system, lateral compression (LC) fractures are the most common and are caused by a lateral force that pushes the impacted hemipelvis to the contralateral hemipelvis (Figures 1-5).

Anteroposterior compression (APC) fractures are responsible for the “open-book” pelvic injuries, caused by a rotational force on one or both hemipelvises, with the SI joint serving as the fulcrum of rotation (Figure 6). APC fractures are subclassified according to the progressive opening of the pelvic ring, as tears of stronger posterior elements follow tears of the weakest anterior ligaments. Anterior SI ligament disruption is present when the pubic symphysis is widened by more than 2.5 cm (the normal width is 0.5 to 1 cm).² By the time the posterior SI ligaments are involved, the pelvic floor and perineal musculature have also been breached.

Vertical shear injuries result from a cranially directed force that breaks the hemipelvis away from

the remaining pelvic structures, often accompanied by a fracture of ipsilateral transverse process of L5 (Figure 7).

Key and Kane Classification

Another useful classification scheme, the Key and Kane system, places pelvic fractures into four categories based on the degree of disruption of the pelvic ring. Kane type I fractures involve a single pelvic bone without interruption of the anatomic ring, such as an avulsion of the anterior superior iliac spine (Figures 1 and 2). Kane type II fractures involve a single break in the ring near the pubic symphysis or an SI joint. By definition, no displacement is present, as that would require a second break in the ring.¹² Kane type III fractures involve double breaks in the pelvic ring (Figures 3-6). Kane type IV fractures are acetabular fractures. Kane types I and II fractures are usually stable, whereas types III and IV are usually associated with significant hemorrhage and visceral injuries.

TABLE 2. Young-Burgess Classification of Pelvic Fractures

Fracture type	Description*
LC	Transverse fracture of pubic rami, ipsilateral or contralateral to posterior injury
Type I	Sacral compression on side of impact
Type II	Iliac wing fracture on side of impact
Type III	LC type I or II injury on side of impact, contralateral APC injury
APC	Symphyseal diastasis and/or longitudinal rami fractures
Type I	Slight widening of pubic symphysis and/or anterior SI joint; stretched but intact anterior SI, sacrotuberous, and sacrospinous ligaments; intact posterior SI ligaments
Type II	Widened anterior SI joint; disrupted anterior SI, sacrotuberous, and sacrospinous ligaments; intact posterior SI ligaments
Type III	Complete SI joint disruption with lateral displacement; disrupted anterior SI, sacrotuberous, and sacrospinous ligaments; disrupted posterior SI ligaments
VS	Symphyseal diastasis or vertical displacement anteriorly and posteriorly, usually through SI joint, occasionally through the iliac wing and/or sacrum

*A combination of these injury patterns can also be seen.

LC = lateral compression; APC = anteroposterior compression; SI = sacroiliac; VS = vertical shear
Adapted from Steele and Ellison.¹⁰

Denis Classification and Sacral Fractures

Sacral fractures occur in approximately 45% of all pelvic fractures.⁷ Stability of a sacral fracture is related to the type of associated pelvic fracture: Sacral fractures accompanying LC pelvic fractures are usually stable, whereas those associated with vertical shear injuries are more unstable.

Sacral fractures are usually vertical in orientation and categorized most commonly using the Denis classification system, which divides the sacrum into three zones. Denis zone I fractures are lateral to the neural foramina, zone II fractures pass through the foramina, and zone III fractures are medial to the foramina and involve the spinal canal.⁷ This schema categorizes transverse sacral fractures as zone III fractures because they traverse the spinal canal.

Other schemata exist that further characterize transverse sacral fractures (H-, U-, lambda-, and T-shaped patterns), the degree of angulation present in Denis zone III fractures (Roy-Camille classification and Strange-Vognsen and Lebech classification),

and the location of the fracture relative to the L5-S1 facet (Issler classification).⁷

CLINICAL FINDINGS

A 2004 meta-analysis by Sauerland et al found that a complete physical exam has nearly 100% sensitivity for detecting clinically relevant pelvic fractures in the stable and alert trauma patient¹³; however, the sensitivity is lower if the examiner has limited clinical experience; if patients have severe multiple distracting injuries or impaired consciousness; or if patients are younger than 3 years.

Signs and symptoms of pelvic fractures are variable depending on the degree of injury and range from localized pain during ambulation and minor tenderness on palpation to pelvic and hemodynamic instability. The stability of

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Indirect markers of a pelvic fracture on clinical exam include perineal and pelvic edema, ecchymoses, lacerations, and deformities.

TABLE 3. Common Injuries Based on Type of Pelvic Fracture

Fracture type	Occurrence (%)		
	Severe hemorrhage	Bladder rupture	Urethral injury
LC			
Type I	0.5	4	2
Type II	36	7	0
Type III	60	20	20
APC			
Type I	1	8	12
Type II	28	11	23
Type III	53	14	36
vs	75	15	25

Data extracted from Steele and Ellison.¹⁰

the pelvic ring is assessed by compressing the pelvis laterally to medially at the level of the iliac crests and the greater trochanters and anteriorly to posteriorly at the level of the iliac crests, as well as the pubic symphysis. If pelvic instability is found, further compression of the pelvis is contraindicated, and repeat examinations should be kept to a minimum to prevent injury to associated structures.

Indirect markers of a pelvic fracture on clinical exam include perineal and pelvic edema, ecchymoses, lacerations, and deformities. In addition, a gap in the pubic symphysis may be seen. External rotation

or shortening of one of the lower extremities is suggestive of an “open-book” or a vertical shear fracture. Hematomas and ecchymoses may be present above the inguinal ligament, on the scrotum (Destot sign), or on the perineum. Palpation

of bony landmarks may reveal step-offs, crepitance, or abnormal movement of the iliac crests, as well as of the pubic and ischial rami. A rectal exam may reveal a bony prominence, large hematoma, or tenderness

along the fracture line (Earle sign). Vaginal or rectal bleeding and lacerations are highly suggestive of an open fracture.

Superior or posterior displacement of the prostate and rectal injury are suggestive of urologic and/or intraperitoneal involvement. Urologic injury is also heralded by blood at the urethral meatus, gross hematuria, or lacerations of the vaginal introitus. Sigmoidoscopy and, in women, a speculum genital examination are required to fully assess the extent of injury but may need to be deferred until the patient can be safely repositioned.

It is important to assess for neurologic injury, which, if present, can lead to urinary incontinence, a decrease in anal sphincter tone, loss of the bulbocavernosus reflex, or deficits involving the sciatic, femoral, or obturator nerves. The rate of neurologic injury with Denis zones I, II, and III sacral fractures has been as high as 24%, 29%, and 60%, respectively.¹⁴

The most life-threatening feature of pelvic fractures is accompanying bleeding from vascular lacerations and bone edges. Markers of bleeding from a pelvic fracture include prehospital hypotension, admission base deficit of at least 5, persistent tachycardia despite adequate pain control and oxygenation,

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recurrent hypotension despite resuscitation, and a transfusion requirement of greater than 6 units of packed red blood cells in the first 24 hours.⁴

ED MANAGEMENT

The key to prehospital management of the patient with pelvic trauma, in addition to support of the airway, breathing, and circulation, is immobilization at the scene and gathering of information regarding the mechanism of injury. The goal of the emergency physician, as always, is to stabilize the patient and diagnose and prioritize injuries that are an immediate threat to the patient's life. Concurrently with the primary and secondary surveys, the emergency physician should consider obtaining trauma surgery, orthopedic surgery, and (if indicated) urology consultations early on. The patient's blood should be typed and cross-matched, and type O-negative blood should be immediately available in anticipation of significant blood loss.

Diagnostic Imaging

The necessity of anteroposterior (AP) pelvis radiography in the fully alert patient with a completely normal pelvic exam is arguable. However, a screening AP view should be performed immediately after stabilization of every patient in whom a pelvic fracture cannot be ruled out by physical exam alone. The AP view of the pelvis has a sensitivity ranging from less than 80% to 90%.³

Other portable adjuncts in the hemodynamically unstable patient include lateral and AP views of the hemipelvis, internal and external oblique views, and the inlet and outlet views of the pelvis. An inlet view is helpful in delineating anterior-posterior displacement in a ring fracture and for visualizing the sacral spinal canal. An outlet view is helpful in identifying superior-inferior displacement and also provides a better AP view of the sacrum. A 45° iliac oblique view and 45° obturator oblique view, known as the *Judet views*, are helpful along with an AP view for diagnosing acetabular fractures.

The type of pelvic fracture has been shown to have a poor correlation with the degree of pelvic hemorrhage present, mainly because bony fragments



FIGURE 1. Left superior ramus fracture (LC type I; Kane type I).

Courtesy of Lorna Breen, MD



FIGURE 2. Right iliac crest fracture (LC type II; Kane type I).

may move after rupturing vessels at the time of impact. Although part of most trauma protocols, the focused abdominal ultrasound for trauma (FAST) exam to detect intraperitoneal fluid has its limitations. Negative findings on FAST with an abnormal pelvic x-ray cannot rule out a retroperitoneal

bleed. The sensitivity and specificity of the FAST exam in major pelvic injuries have been found to be 81% and 87%, respectively¹⁵; however, in blunt trauma patients, the sensitivity ranges from 90% to 100%, and the specificity ranges from 97% to 99%.¹⁵ This difference has been attributed to the distortion of pelvic structures in pelvic trauma patients by retroperitoneal hematomas and skeletal displacement. One possible algorithm for utilizing FAST in an unstable blunt trauma patient has been suggested by Tayal and colleagues.¹⁵ In this algorithm, positive findings on FAST in the presence of a normal pelvic x-ray warrant an immediate laparotomy, while a positive FAST result with an abnormal pelvic x-ray warrants diagnostic peritoneal lavage to differentiate between blood (requiring immediate laparotomy) and urine (requiring angiography for a pelvic source of hypotension and delayed laparotomy). The diagnostic peritoneal lavage should be performed via a supraumbilical approach to minimize risk of penetrating a pelvic hematoma and producing a false-positive result.

CT of the pelvis is becoming the gold standard in the hemodynamically stable patient for determining the presence of bony injury (especially involving the posterior pelvic arch and acetabulum), degree of organ involvement, and presence and extent of pelvic hemorrhage. In the hemodynamically unstable patient, CT should be deferred, as the patient will likely need surgery; however, this decision should be made in conjunction with the trauma and orthopedic surgeons.

Diagnosis of Genitourinary Injuries

Clear-cut symptoms of urethral and bladder injuries take several hours to develop and are rarely visible in the immediate postinjury setting.

Traditionally, clinicians have deferred placement of a Foley catheter in a patient with signs suggestive of urologic injury, such as blood at the urethral meatus or a high-riding prostate, until a definitive urologic imaging study has been performed. In addition, it is notable that several studies recommend against the use of the digital rectal exam as a screening tool for detecting spinal cord, genitourinary, or gastrointestinal injuries in trauma patients because of its poor sensitivity. For instance, Shlamovitz et al found that the sensitivity of detecting urethral disruption by rectal exam was as low as 20%.¹⁶ Furthermore, there is little evidence to prove that blind attempts at urethral catheterization in patients with urethral in-

Courtesy of Keith D. Hentel, MD



FIGURE 3. Left superior and inferior pubic rami fracture (LC type II; Kane type III).

Courtesy of Keith D. Hentel, MD

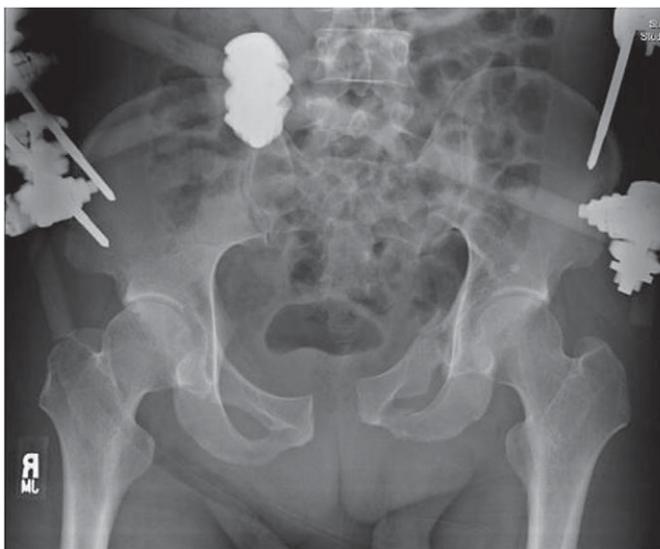


FIGURE 4. Widening of the pubic symphysis with a fracture of left superior pubic ramus (LC type III; Kane type III).

juries worsen the initial injury.⁸ Thus, some recommend that a clinician experienced in catheter placement may attempt to carefully place a Foley catheter in a patient in the ED. When a Foley catheter has been easily inserted, contrast or CT cystography to evaluate the genitourinary system can be deferred until the patient has been stabilized.

If resistance to Foley catheter insertion is encountered, efforts to advance the catheter should be stopped and retrograde urethrography should be performed with collaboration of the urology team. This can be done at the bedside, using 2 to 3 mL of saline to inflate the Foley catheter balloon in the penile urethra to the level at which resistance to catheter insertion is noted. Fifteen to 20 mL of water-soluble contrast is then injected through the catheter, and an oblique x-ray of the pelvis is taken to visualize the urethral tract. Failure to pass contrast into the bladder or extravasation of contrast as seen on the plain film is suggestive of urethral injury.⁴ If a urethral injury is found on the urethrogram, a suprapubic catheter or an endoscopically placed transurethral catheter is an alternative for bladder decompression, although suprapubic catheters complicate internal approaches to fixing pelvic fractures.

Fluid Resuscitation

After the establishment of large-bore IV access, fluid resuscitation should be performed in accordance with advanced trauma life support guidelines. Reversal of anticoagulation should be performed early using fresh frozen plasma, vitamin K, or platelets. Rapid infusers for the delivery of warmed blood products may be needed, as the patient may require 4 to 6 units of blood before tamponade of venous bleeding is achieved.⁴ Platelet counts should be maintained above 100,000/ μ L.⁴

External Compression

In patients with unstable pelvic fractures, external compression devices have been shown to reduce transfusion requirements, length of stay, and mortality.³ External compression devices minimize ongoing bleeding by closing pubic symphysis separations, reducing the pelvic volume, and splinting the pelvis to minimize further shear injury to the vasculature during transport and transfers.

The pneumatic antishock garment was used for several years to close open-book fracture injuries and

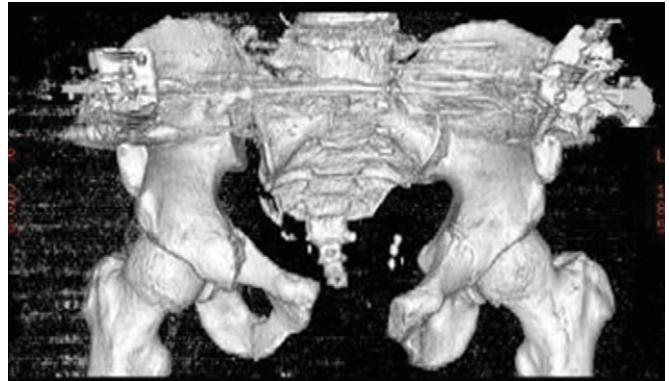


FIGURE 5. CT reconstruction of a pelvis with an LC type III/Kane type III fracture.

Courtesy of Keith D. Hentel, MD



FIGURE 6. Marked widening of the pubic symphysis in a patient with an APC type III/Kane type III fracture.

Courtesy of Keith D. Hentel, MD

stabilize the pelvis in the emergency setting; however, its use is no longer recommended because it limits access to the patient for repeat abdominal exams and poses a risk for compartment syndrome and skin necrosis.¹ More flexible alternatives to the pneumatic antishock garment that can be easily applied in the ED include commercially available pelvic binders and a folded bed sheet, which can be tied across the pelvis at the level of the greater trochanters.

While not all pelvic fractures are amenable to external compression, an initial trial of a compression device is reasonable. Compression is especially



Courtesy of Keith D. Hentel, MD

FIGURE 7. Left-sided vertical shear fracture with a widened pubic symphysis (Kane type III).

important prior to neuromuscular blockade for intubation, when muscle relaxation might lead to further loss of pelvic stability. Additionally, external compression should be considered in patients with AP compression injury, as the injury increases the volume of the pelvis, reducing the chance that spontaneous tamponade of the bleeding will occur. External compression devices may lead to overcorrection of the fracture, which should be ruled out by confirming that the patient's neurovascular status is the same before and after application and by obtaining post-reduction x-rays. Pressure ulceration and necrosis become a significant risk in patients with pelvic binders in place for more than 48 hours.⁴

Angiography

In patients presumed to have ongoing pelvic bleeding despite external compression or who have evidence of active bleeding on CT or an expanding retroperitoneal hematoma on laparotomy, transfemoral angiography is highly accurate in localizing and selectively embolizing bleeding vessels. Up to 73% of patients who have recurrence of hypotension within 2 hours of initial resuscitation have evidence of active arterial bleeding on angiography.⁴ The decision to use angiography should be made in collaboration with the hospital's trauma surgeons, orthopedic surgeons, and interventional radiologists.

Open exploration and packing is a more inva-

sive alternative to angiography. When angiography is not immediately available, this method is used typically as a temporizing measure in patients with heavy ongoing bleeding.

Furthermore, embolization of bilateral internal iliac arteries may be required in cases involving multiple bleeding sources. Side effects of this procedure include necrosis of pelvic viscera and, more rarely, sexual dysfunction. Recurrence of bleeding after embolization is also possible, especially in older patients.

Surgical Fixation

Orthopedists use surgical fixation as an adjunct to angiography/packing to stabilize the pelvis. The type of surgical fixation used depends on the degree of instability of the pelvic ring. Anterior fixation alone may be sufficient when the posterior ligaments are intact, while both posterior and anterior fixation may be required when posterior ligaments are completely disrupted.

Both external and internal approaches to surgical fixation are possible. External skeletal fixation includes anterior frames that are applied percutaneously to the iliac bones, either above the acetabulum or into the iliac crest, and pelvic clamps that are applied to the posterior iliac fossa at the iliac groove. External fixation can be applied by orthopedists in the ED and removed at the bedside on follow-up. External fixation also reduces the risk for procedure-related internal bleeding and contamination from perforated viscera.

Internal and external fixation have been shown to have equal efficacy in treating symphyseal separations.⁴ External fixation has been shown to be ineffective, however, in controlling vertical and posterior displacement of the posterior ring segments in unstable pelvic fractures.⁴ In such cases, internal fixation using plates or screws to approximate the posterior ring to less than 1 cm of combined displacement is preferable.⁴

Internal fixation facilitates early mobilization and shortened hospital stays.⁶ It also involves less cumbersome aftercare but poses the risks inherent to all invasive procedures and, in women, has the potential to limit pelvic relaxation in childbirth.

Conservative Management

Conservative management is an option for LC type I, anteroposterior type I, and Kane types I and II fractures, in which the bones are usually minimally

displaced and the integrity of the pelvic ring is preserved.^{6,12} It is important to note that conservative management should be considered only in consultation with the orthopedists and after a full trauma evaluation has ruled out other injuries. Patients are initially treated with partial weight-bearing on the affected side and pain control. Surgical intervention may be needed in the future if displacement occurs after weight bearing.

CONCLUSION

Whether as a result of major accidents or of falls in the elderly, most emergency physicians are likely to encounter pelvic fractures. While mortality and morbidity are expectedly high in the multitrauma patient, isolated pelvic fractures also have the potential for severe complications from retroperitoneal bleeding or associated organ injury. Early recognition and stabilization by the emergency physician in conjunction with consulting surgeons offers patients the best chances for recovery. □

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