

Flank Pain in the Emergency Department

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Abstract

There are many possible patterns of pain. In some cases, the pain can be caused by a condition or injury that affects a completely different part of the body. These causes range from mild injuries that heal quickly with rest to aggressive illnesses that require urgent medical treatment. In order to determine the source of the pain, the causes need to be considered.

Introduction

An emergency is commonly defined as any condition perceived by the prudent layperson - or someone on his or her behalf - as requiring immediate medical or surgical evaluation and treatment [1]. On the basis of this definition, the American College of Emergency Physicians states that the practice of emergency medicine has the primary mission of evaluating, managing, and providing treatment to these patients with unexpected injury and illness.

So what does an emergency physician (EP) do? He or she routinely provides care and makes medical treatment decisions based on real-time evaluation of a patient's history; physical findings; and many diagnostic studies, including multiple imaging modalities, laboratory tests, and electrocardiograms. The EP needs an amalgam of skills to treat a wide variety of injuries and illnesses, ranging from the diagnosis of an upper respiratory infection or dermatologic condition to resuscitation and stabilization of the multiple trauma patients. Furthermore, these physicians must be able to practice emergency medicine on patients of all ages. It has been said that EPs are masters and mistresses of negotiation, creativity, and disposition. Clinical emergency medicine may be practiced in emergency departments (EDs), both rural and urban; urgent care clinics; and other settings such as at mass gathering incidents, through emergency medical services (EMS), and in hazardous material and bioterrorism situations.

In healthcare delivery, we attempt to meet the health and medical needs of the community by providing a place for individuals to seek preventative medicine, care for chronic medical conditions, emergency medical treatment, and rehabilitation from injury or illness [2]. While a healthcare institution serves the community, this responsibility occurs at the level of the individual. Each individual expects a thorough assessment and treatment if needed, regardless of the needs of others. This approach is different than that practiced by emergency managers, whose goal is to assist the largest number of people with the limited resources that are available. As such, emergency management principles are focused on the needs of the population rather than the individual. When either planning for a disaster or operating in a disaster response mode, the hospital should be prepared at some point to change its focus from the individual to the community it serves and to begin weighing the needs of any individual patient versus the most good for the most patients with scarce resources. Moving from the notion of doing the most for each



Franjić S*

Independent Researcher, Republic of Croatia

Address for Correspondence

Independent Researcher, Republic of Croatia; E-mail: sinisa.franjic@gmail.com

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individual to doing the best for the many is a critical shift in thinking for healthcare institutions considering a program of comprehensive emergency management. While the initial planning for emergencies by hospitals is focused on maintaining operations and handling the care needs of actual or potential increased numbers of patients and/or different presentations of illness or injury than is traditionally seen, there is also the need to recognize that at some point during a disaster, act of terrorism, or public health emergency there may be an imbalance of need versus available resources. At this point the approach to delivering healthcare will need to switch from a focus on the individual to a focus on the population. This paradigm shift is one of the core unique aspects of hospital emergency management that allows the hospital to prepare to maximize resources in disasters and then to know when to switch to a pure disaster mode of utilizing its limited and often scant resources to help the most people with the greatest chance of survival.

The healthcare delivery system is vast and comprised of multiple entry points at primary care providers, clinics, urgent care centers, hospitals, rehabilitation facilities, and long-term care facilities. The point of entry for many individuals into the acute healthcare system is through the emergency department (ED). Since the late 1970s, the emergency medical services (EMS) system has allowed victims of acute illness and injury to receive initial stabilization of life-threatening medical conditions on the way to the emergency department. Among the many strengths of the ED is the ability to integrate two major components of the healthcare system: prehospital and definitive care. The emergency department maintains constant communications with the EMS system and serves as the direct point of entry for prehospital providers into the hospital or trauma center. Emergency physicians represent a critical link in this process by anticipating the resources that ill and injured patients will need upon arrival at the ED, and initiating appropriate life-saving medical care until specialty resources become available. In this context, the healthcare system is an emergency response entity.

Patient Conditions

In most emergencies there is no time to disclose the necessary information for an informed consent [3]. Here the providers simply act according to what they think will be in the best interests of the

patient. These situations frequently happen in hospital emergency rooms and when emergency medical personnel arrive on the scene of an accident or sudden illness.

The emergency exception to informed consent is often quite obvious, but this is not always so. It does not apply, for example, when personnel taking care of somebody in an emergency happen to know what the patient wants. In such a situation they would not do what they think is best for the patient but what they know the patient wants.

It is important to note that the emergency exception that allows physicians to do what they think is best for the patient without obtaining informed consent from the patient or proxy has one major restriction; namely, they cannot do what they think is best if it is otherwise than what they know the patient or proxy wants. Sometimes, for example, emergency department personnel might know from previous admissions that a particular patient from a local nursing home desires only palliative care. If that patient arrives by ambulance at the same emergency department, it is hard to see how it would be morally reasonable for physicians to take aggressive measures to keep the patient alive when, even though there is no time to obtain consent for orders not to attempt resuscitation or not to intubate, they know he or she or a proxy has decided not to have aggressive life-sustaining measures performed.

Patients accessing emergency care services can present with complaints that are extremely diverse, and the way doctors, nurses and paramedics elicit information from patients predominantly focuses on obtaining biomedical details [4]. In some cases, this approach is warranted, as the urgent need to identify signs and symptoms of life-threatening illness or injury is paramount. Yet, 90% of patients accessing emergency services are not critically ill or injured but seek help and advice. In addition to seeking advice, patients may also be anxious, frightened, intoxicated, misusing drugs or have unhealthy lifestyles. They may have psychosocial reaction to physical disease or vice versa - physical illness such as irritable bowel syndrome, asthma, tension headache can be triggered by psychosocial factors. The effects and interpretation of illness will trigger a different response to the individual depending on their view and experiences. All these factors will have different needs and concerns and it is important to elicit these concerns within a consultation. However, it has been found that nurses working in emergency care disregard the potential for anxiety and the need for support and reassurance in patients who are not severely ill or injured. In addition, where communication skills of junior doctors working in emergency departments have been researched, they are found to use approaches considered to be more physician/illness orientated than patient-centered. By way of similarities of patient presentations in the pre-hospital setting, this could equally be assumed for paramedic practice.

Flank pain

Severe unilateral flank pain that comes and goes in waves and that radiates towards the groin is typical of ureteric colic, where the symptoms correlate with the passing of a kidney stone from the renal pelvis into the ureter [5]. Pain is very common, with other features including haematuria, nausea, vomiting, urinary symptoms (frequency, dysuria) and testicular or penile pain. Pain is thought to result when the stone becomes lodged in the ureter, with flank

pain thought to result from upper urinary tract obstruction and groin or pelvic pain arising from obstruction at the lower ureters or vesicoureteric junction (VUJ).

Risk factors for nephrolithiasis include personal and family history of stone disease (up to 30% of patients with kidney stones have a recurrence within 5 years), urinary tract infections, inadequate hydration, persistently acidic urine (e.g. with chronic diarrhea and gout) and increased oxalate absorption from the gut.

In the ED, the key to dealing with a patient who has suspected ureteric colic is to confirm the diagnosis and assess for complications. Confirmation of the diagnosis can be achieved through either a low-dose CT-KUB (Computed tomography of kidneys, ureters and bladder) or ultrasound of the urinary tracts; while CT-KUB carries a radiation exposure risk; it has a much higher sensitivity than ultrasound and is generally the test of choice. Ultrasound should be used in pregnant women and is a good method of identifying hydronephrosis, but may miss small stones. The complications of kidney stones include urinary tract obstruction and infection, and therefore, renal function and urinalysis should always be checked.

Symptomatic, acute ureteric colic typically presents as unilateral flank pain often radiating to the ipsilateral groin [6]. As the calculus descends the ureter, the patient develops symptoms of cystitis. Nulliparous patients complain that the pain of ureteric colic is second to none and their primary objective for an ED visit is pain relief. Opioids have long served as the analgesic of choice by these patients and their attending emergency physicians. Opioids act on the central nervous system to reduce the perception of pain. Impressive doses are often required to reach the desired effect and are associated with vomiting and decreased level of consciousness. While often effective, opioids do not address the etiological mechanisms of the pain associated with renal colic.

UTO

Urinary tract obstruction (UTO) refers to structural or functional impediment to urine flow along the urinary tract [7]. It leads to increased pressure within the urinary tract which, if left uncorrected, causes renal injury. UTO may be acute or chronic, partial or complete, and unilateral or bilateral. In acute UTO, the renal impairment is usually reversible if the obstruction is relieved early. However, if the obstruction is left untreated, it may cause progressive and irreversible loss of renal function. In fact, UTO remains an important cause of chronic kidney disease (CKD). Because recovery of renal function is inversely related to the duration and degree of obstruction, early diagnosis and treatment are crucial. The term “obstructive uropathy” refers to the structural or functional changes that hinder urine flow, while “obstructive nephropathy” refers to the functional or structural changes in the kidney that result from obstructive uropathy.

The diagnostic approach to a patient who may have UTO starts with the history and physical, which may not only suggest the presence of UTO but also point toward the etiology, thus streamlining the diagnostic evaluation. The information obtained should include type and duration of symptoms, changes in previous symptoms, history of renal calculi, previous surgeries, and medication use.

Pain is a common complaint and results from stretching of the collecting system or renal capsule. The severity depends on the rate,

thus patients with acute obstruction can present with typical renal colic, whereas those with chronic obstruction may be asymptomatic. The location and characteristics can help determine the site and type of obstruction. The other more frequent complaints are urinary tract symptoms. Urine output may oscillate between polyuria and oliguria, or even present as anuria. Hesitancy, decreased urine stream, and dribbling are associated with bladder outlet obstruction. Recurrent urinary tract infection may be the only complaint.

As with other forms of AKI (Acute Kidney Injury), the physical exam should begin by assessing volume status. Obstructive nephropathy may be associated with new onset or worsening hypertension, due to increased volume (bilateral obstruction) or increased angiotensin II (unilateral obstruction). However, it may also be associated with hypotension when partial obstruction has caused polyuria. Abdominal exam may find a flank or suprapubic mass (hydronephrosis and distended bladder, respectively). A pelvic exam in women and rectal exam in all patients are essential to assess for masses or an enlarged prostate in men. Evidence of uremia may also be present. Bladder catheterization may reveal a large amount of residual urine. Depending on the cause of the obstruction, the urinalysis may show hematuria, low-grade proteinuria, pyuria, bacteriuria, or crystalluria. As mentioned before, the urine indices initially resemble prerenal indices, but convert to that of intrinsic failure when the concentrating defects became clinically significant.

Anchoring

Anchoring can give rise to particularly difficult failures in the ED [8]. These occur when paramedics, nurses, or physicians attach, commit, or anchor to a particular diagnosis early on in the presentation. This usually occurs because certain sign and symptom patterns may strongly suggest a particular diagnosis, which is adopted without giving sufficient consideration to other possibilities on the differential. For example, consider a 60-year-old male with a history of renal stones presenting with flank pain, nausea and vomiting, and hematuria. The obvious diagnosis is ureteral colic, and inexperienced nurses and physicians will anchor on this. For the vast majority of cases, the anchor will serve them well, but occasionally an aortic dissection will be missed, sometimes with fatal consequences. The order in which information is obtained strongly influences anchoring, with initial information being given greater importance than that gathered later. Anchoring is difficult to recognize in oneself; perhaps the only sure way out of it is to have a new set of eyes look at the problem (such as often occurs at change of shift).

Pelvic

The pelvis is briefly examined as part of the cardiovascular assessment in the ABC approach to trauma [9]. The suprapubic, pelvic and urogenital regions are inspected for signs of bruising, abrasions, open wound and obvious deformity. In males, the urethral meatus is assessed for the presence of frank blood and the scrotum for bruising. Flank bruising may indicate retroperitoneal hemorrhage.

Pelvic compression or 'pelvic springing' has been in widespread use ostensibly as a means to assess for pelvic injury and to assess the stability of a fracture. It adds little to the assessment of a patient beyond gentle palpation. As it may dislodge clots in an injured pelvic venous plexus resulting in catastrophic bleeding, it is no longer

recommended in anyone with hemodynamic compromise and/or an obvious pelvic fracture.

Dull pain

The classic description is of periumbilical, epigastric, or diffuse dull pain migrating over several hours to McBurney's point in the right lower quadrant, with the pain changing in character from dull to sharp as the overlying peritoneum becomes inflamed [10]. Peritoneal signs, including involuntary guarding, rigidity and diffuse percussion tenderness may indicate perforation. The pain is less likely to be appendicitis if it has been ongoing for more than 72 h. Associated symptoms which increase the likelihood of appendicitis are anorexia or nausea and vomiting following the onset of abdominal pain. Less specific and less frequently associated symptoms include fever, chills, diarrhea, dysuria and frequency, and constipation. Constipation is a more common symptom in the elderly. The location of the pain is highly variable. 20% of surgically proven appendicitis presents without right lower quadrant pain. Retrocecal appendices or those displaced in pregnancy may cause flank pain. A pelvic appendix may irritate the bladder, resulting in suprapubic pain or dysuria, while a retroileal appendix may irritate the ureter, causing testicular pain. More than two-thirds of appendices lie within 5 cm of McBurney's point, with more inferior and medial. Frequently associated signs include low-grade temperature, abdominal rebound, rectal, or cervical motion tenderness. Less commonly present are the psoas and obturator signs or a palpable mass.

Responsibility of the Physicians

The aim is to provide excellence in emergency department (ED) care by cultivating the following desirable habits [11]:

- Listen to the patient.
- Exclude the differential diagnoses ('rule out') and refine the possible diagnosis ('rule in') when assessing any patient, starting with potentially the most life-or limb-threatening conditions, and never trivializing.
- Seek advice and avoid getting out of depth by asking for help.
- Treat all patients with dignity and compassion.
- Make sure the patient and relatives know at all times what is happening and why, and what any apparent waits are for.
- Maintain a collective sense of teamwork, by considering all ED colleagues as equals whether medical, nursing, allied health, administrative or support services.
- Consistently make exemplary ED medical records.
- Communicate whenever possible with the general practitioner (GP).
- Know how to break bad news with empathy.
- Adopt effective risk management techniques.

The duty of care is a physician's obligation to provide treatment according to an accepted standard of care [12]. This obligation usually exists in the context of a physician - patient relationship but can extend beyond it in some circumstances. The physician - patient

relationship clearly arises when a patient requests treatment and the physician agrees to provide it. However, creation of this relationship does not necessarily require mutual assent. An unconscious patient presenting to the ED is presumed to request care and the physician assessing such a patient is bound by a duty of care. The Emergency Medical Treatment and Active Labor Act (EMTALA) require ED physicians to assess and stabilize patients coming to the ED before transferring or discharging them. Such an assessment presumably creates the requisite physician - patient relationship.

When caring for a patient, a physician is obligated to provide treatment with the knowledge, skill, and care ordinarily used by reasonably well - qualified physicians practicing in similar circumstances. In some jurisdictions, these similar circumstances include the peculiarities of the locality in which the physician practices. This locality rule was developed to protect the rural practitioner who was sometimes deemed to have less access to the amenities of urban practices or education centers. However, the locality rule is being replaced by a national standard of care in recognition of improved information exchange, ease of transportation, and the more widespread use of sophisticated equipment and technology.

Establishing the standard of care in a given case requires the testimony of medical experts in most circumstances, unless the breach alleged is sufficiently egregious to be self-evident to the lay jury member-for example, amputating the wrong limb or leaving surgical implements in the operative field. A physician specializing in a given field will be held to the standard of other specialists in the same field, rather than to the standard of non-specialists.

To be eligible to receive federal funds such as Medicare and Medicaid, hospitals with an emergency department must offer emergency and stabilizing treatment services to the public without bias or discrimination [13]. The Emergency Medical Treatment and Active Labor Act is a comprehensive federal law that obligates hospitals offering emergency services to do so without consideration of a patient's ability to pay. It's important to note that this obligation does not apply to inpatients or non-emergent conditions. The absence of bias in the delivery of care should not be misunderstood to suggest all hospitals must provide all medical services, but rather the services they choose to offer must be delivered without bias to the individual patient.

A hospital and its entire staff owe a duty of care to patients admitted for treatment [14]. Following an emergency call, the ambulance service has a duty to respond and provide care. Accident & Emergency (A&E) departments have a duty of care to treat anyone who present themselves and are liable for negligence if they send them away untreated. Hospitals without an A&E facility will display signs stating the location of the nearest A&E department. This ensures that the hospital could not be held negligent if a patient presented and required emergency treatment as the hospital or its staff had never assumed a duty of care. Once a patient is handed over, a duty of care is created between the patient and the practitioner and this cannot be terminated unless the patient no longer requires the care or the carer is replaced by another equally qualified, competent person. It is therefore extremely important that practitioners are aware of their local policies, professional standards and their scope of practice

to avoid becoming liable for litigation by putting a patient at risk, delivering ineffective care or breaching their duty of care.

Conclusion

The pain can be stronger or weaker, depending on the cause, and in any case makes daily behavior and movement difficult. The biggest problem with pain is the situation when the pain appears unprovoked. This event is a sure sign that something is wrong. Feeling pain in the legs after training, long walks or running is not uncommon and should not be a problem. Thigh pain can occur due to an injury to the thigh, knee or back. Musculoskeletal pain is an uncomfortable sensory and emotional experience associated with actual or potential damage to tissues, muscles, ligaments, tendons, and bones.

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