

AMSN Pathophysiology Project (1/15/2025)

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1). Provide a description of your patient including current diagnosis and past medical history.

Current Diagnosis: My patient was an 84-year-old female who came in on the 12 of January related to worsening pain in her left leg and left side of her abdomen. She had fallen the previous Tuesday, January 7, which had caused bruising on the back of her left leg as well as a welt on her head. Her admitting diagnosis was an anemia as well as an acute bowel perforation which is defined as a tear in the intestinal track. After coming into the emergency department, she was sent to surgery to have the perforation repaired and was then admitted to 4Progressive with a nasogastric tube.

Past Medical History: My patients past medical history includes rheumatoid arthritis, hiatal hernia, thyroid disease, hyperlipidemia, and hypertension. Rheumatoid arthritis is an inflammatory process that causes inflammation in the joints that leads to pain with movement. A hiatal hernia is when a part of the stomach pushes up into the diaphragm due to either trauma or weakening of the muscles. Thyroid disease is a process in which the thyroid gland is not properly functioning. This can be due to the gland either producing too much thyroid hormone or too little thyroid hormone resulting in weight loss, weight gain, and other symptoms. Hyperlipidemia is when high levels of fats or lipids are accumulating in the blood which can be caused by many things such as an unhealthy lifestyle. Finally, hypertension is when someone is consistently having high blood pressures, over 140/90, for a certain period.

Past Surgical History: My patient has only had a couple of surgeries throughout her lifetime. The first surgery is a lumbosacral spine surgery which is a surgery of the lower back that would be beneficial for lower back disorders. The next one is an open reduction and internal fixation, or an ORIF, which is used to set broken bones and using rods or screws to stabilize then in the healing process. My patients had this procedure done on her ankle which she had broken due to a fall. The final surgery she had was a phacoemulsification of cataract of both eyes and had intraocular lenses implanted into both eyes. This surgery is performed in order to remove the cataracts on the eye that are causing issues with vision. They are then replaced with a new artificial lens so that way the patient can see more clearly (National Library of Medicine).

2). Describe the pathophysiology of your patient's current diagnosis.

When a bowel perforation occurs, there is an ulcer along the intestine that will penetrate the serosal surface. For my patient specifically, her perforation was at the pylorus which is at the exit of her stomach and beginning of the duodenum. This then causes gastric contents to spill or leak out into the peritoneal cavity that contain air, saliva, food, hydrochloric acid, pepsin,

bacteria, bile, pancreatic fluid, and enzymes. All of which are not sterile, and this can be very harmful to the body due to the peritoneal cavity being a sterile space (Lewis, p. 1071)

3). Correlate the patient's current diagnosis with presenting signs and symptoms.

Symptoms on admission: Upon admission, my patient was experiencing a few different symptoms. She was having increasingly worse pain in her abdomen as blood in her stool. In the ER physician note, it did not state anything about any nausea or vomiting, just pain.

Symptoms post-operative: After surgery and being admitted onto 4Progressive, my patient did not seem to have very many symptoms at all during my time with her. When asked if she had pain, she always stated no when she was laying still or rolling side to side. She only complained of a little pain when I had to lay her back to boost her up in bed which was more than likely related to the stretching of her abdomen with the sutures. She had dark gastric contents in her suction canister, which was due to the decreasing bleeding from her surgery mixing with stomach contents. She was a little more confused due to the anesthesia she was still recovering from and right when she would wake up, but was becoming more oriented as the day went on.

Expected symptoms: An expected symptom of a bowel perforation includes abdominal pain which my patient did have however, it was not sudden as she stated it was a gradual worsening pain and pain radiating to the back and shoulders which she also did not have, but she did have pain in her left leg. Another expected symptom is a rigid and board-like abdomen which my patient did not have during my time with her, her abdomen was fairly within normal limits aside from the suture site and JP drain. Absent bowel sounds are also a symptom of a bowel perforation, however since I had my patient during her post-operative period, she did have normoactive bowel sounds. Nausea and vomiting are a typical sign of a bowel perforation, but there were not any documents suggesting her having any nausea or vomiting, as well as her stating she did not feel nauseous. A final symptom of a bowel perforation is a weak and increased heart rate. While taking my patient's vital signs and assessing her pulses, her heart rate was within normal and her pulses seemed strong (Lewis, p. 1071).

4). Correlate the patient's current diagnosis with all related labs (Skyscape).

Lab	Drawn Value	Normal Value	Correlation
White Blood Cells (WBC) This will show early signs of an infection starting in the body.	3.2 x 1000mm ³	3.8-11.6 x 1000/mm ³	This lab value would typically be increased due to the risk of infection with a perforation, however because it is lower

			than normal, it is possibly related to the amount of blood loss because of trauma to the intestine.
<p>Red Blood Cells (RBC)</p> <p>This relates to the amount of blood that is circulating in the body.</p>	2.29 million/mm ³	3.6-5.0 million/mm ³	This lab value was expected to be low because this patient is already anemic because of the trauma to her intestine. There was blood loss resulting in a lower red blood cell count (Skyscape).
<p>Hemoglobin (Hgb)</p> <p>This related to the amount of oxygen that is carried in the body.</p>	7.3 g/dL	11.8-15.4 g/dL	This lab value was also expected to be low due to the perforation in the intestine causing open wounds bleeding into the intestines, stomach, and peritoneal cavity. This also explains my patient having difficulty breathing (Skyscape).
<p>Hematocrit (HCT)</p> <p>This measures the amount of red blood cells in the blood.</p>	21.8%	36-46.4%	This lab value is expected to be lowered due to the correlation with the hemoglobin levels. Generally, if one is low the other will be too and since the intestinal perforation was bleeding then the hematocrit levels are expected to drop (Skyscape).
<p>Red Cell Distribution Width (RDW)</p> <p>This measures the sizes of the red blood cells in the blood</p>	16.5%	11.9-15.3%	This lab value is increased due to the fact that because of the intestinal bleeding, my patient

stream.			then became anemic which is what can cause this lab value to increase leading to increased red blood cell size to attempt to carry enough oxygen (Cleveland Clinic).
Carbon Dioxide (CO2) This was drawn to get an understanding of how well my patients was oxygenating.	20.1 mEq/L	24-30 mEq/L	This lab value would be decreased due to the fact that because my patient was actively bleeding, this decreased the ability of her body to effectively go through gas exchange. This results in a low CO2 level as well as her having a low SpO2 level related to difficulty breathing (Skyscape).
Blood Urea Nitrogen (BUN) This is drawn to evaluate kidney function.	62 mg/dL	7-25 mg/dL	This laboratory value will be at an increased level due to that fact that because the intestine is bleeding because of the perforation, the intestinal tract continues to digest that blood. So, because this blood is being digested that means that the kidneys have to metabolize blood proteins in order to excrete this causing the BUN to be elevated (Skyscape).
Creatinine This is drawn in order to monitor kidney	1.32 mg/dL	0.60-1.20 mg/dL	This lab value can be increased with a bowel perforation due

function.			to the amount of blood loss decreasing blood flow to the kidneys causing them to function less effectively leading to a creatinine build up in the blood stream (Skyscape).
Glucose This is drawn to show blood sugar levels, which can indicate illness or trauma if elevated.	175 mg/dL	80-120 mg/dL	This lab value would be increased due to the fact that because the body is undergoing a large amount of stress, this signals an increase in blood glucose in response to a stressor like the bowel perforation.
Total Creatine Kinase This can be drawn to help determine muscle damage.	229 U/L	30-223 U/L	This lab value can increase due to the intestinal wall being damaged causing a release of this (Skyscape).
B-Type Natriuretic Peptide (BNP) This is drawn to show how well the heart is functioning.	328.0 pg/mL	5-100 pg/mL	This lab value can be increased for two different reasons. My patient has a history of high blood pressure which can cause this lab value to increase, and she also came to the ED with difficulty breathing which can also cause this lab value to increase due to difficulty with oxygenation (Skyscape).

5). Correlate the patient's current diagnosis with all related diagnostics.

Diagnostic	What was determined	Correlation
Femur X-Ray Normal: No breaks or fractures.	Nothing abnormal was seen with this diagnostic.	This was performed due to my patient having pain radiating in her left leg, so this was done to rule out anything that may have been occurring with her leg.
Pelvis X-Ray Normal: No breaks or fractures.	This diagnostic showed minimal degenerative changes in the pelvis.	This was performed in order to rule out any related problem in the pelvic area. This only showed normal change due to age.
Ribs X-Ray Normal: No breaks or fractures.	This diagnostic showed that the patient had a type of scoliosis.	This was done so that way we could rule out any broken ribs related to the pain that she was having at the time.
Abdomen and Pelvis CT Normal: No tumors, breaks, fractures, clots, or bleeding shown.	This diagnostic showed a questionable ulcer of the pylorus/duodenal bulb.	This diagnostic was done so that way we could get an entire image of the intestines and other organs to see if there was anything going on with them. What this revealed was that there was a possible perforation/already perforation ulcer that would be the cause of the pain my patient was having.

6). Correlate the patient's current diagnosis with all related medications. (Skyscape)

Medication	What it is	What it does	Correlation
Amlodipine 5mg PO	Therapeutic Class: Antianginal Pharm Class: Calcium Channel Blocker (Skyscape)	-Decreases BP -Decreases severity/occurrence of angina -Decreases risk of hospitalization r/t angina	My patient takes this due to her high blood pressure, but this is especially important in the healing process of her ulcer so that way her blood pressure doesn't get too high preventing clotting and delaying healing.
Pantoprazole 40mg IVP	Therapeutic Class: Antiulcer agents Pharm Class: PPI (Skyscape)	-Decreases accumulation of gastric acid -Healing of duodenal ulcers	My patient is receiving this medication while hospitalized because this will help with her

		-Decreased acid secretion	healing perforation so that gastric acid does not prevent healing. It will also prevent her from developing any other ulcers that could lead to another perforation.
Enoxaparin 30mg SC	Therapeutic Class: Anticoagulants Pharm Class: Antithrombotic, low molecular weight heparins (Skyscape)	-Prevention of thrombus formation	Due to my patient having a recent surgery, it is important that she does not stress herself too much as it would delay healing. Also, due to her remaining in bed, it is important that we take precaution to prevent and blood clots from forming because this could cause many other issues on top of the perforation itself. This would lead to longer hospitalization and the possibility of another surgery.
Hydromorphone 0.5mg IVP PRN	Therapeutic Class: Opioid analgesic Pharm Class: Opioid agonist (Skyscape)	-Decreases moderate to severe pain	My patient is receiving this medication in order to manage her pain. With having abdominal surgery, it is important to manage the pain in order to prevent strain to the incision site as to promote healing, but also so that straining and being so tense does not lead to more pain that is worse.
Ondansetron 4mg IVP PRN	Therapeutic Class: Antiemetics Pharm Class: Five HT3 antagonist	-Decreases incidence/severity of nausea and vomiting following chemo,	My patient is receiving this due to the fact that she just had abdominal

	(Skyscape)	radiation, or surgery	surgery, and she was more than likely nauseous coming off of it. With the abdominal surgery, any time of vomiting would cause stress on the suture site which could impair the process of healing
Lactated Ringers @75mL/hour	Fluids	-This is used to balance electrolyte levels and replace fluid volume in the body	My patient is receiving this for a few different reasons. My patient is NPO due to the perforation in her intestine, so in order for her to be adequately hydrated she has to receive fluids. She also lost a decent amount of blood with the perforation, so she needs the fluids to bring her blood volume back up and also make sure her electrolyte levels stay within normal.

7). Correlate the patient’s current diagnosis with all pertinent past medical history.

Past Medical History	What it is	Correlation
Hiatal Hernia	A hiatal hernia is a weakened point at the top of the stomach, causing it to extend up into the diaphragm.	This can be related to the bowel perforation because if my patient already has a weakened point in her GI tract, there is likelihood that it could occur in other places such as the small or large intestine.
Rheumatoid Arthritis (RA)	Rheumatoid arthritis is an inflammatory disease that causes inflammation in the	People with RA take many medications to treat it along with many others. When

	<p>joints and breakdown of the cushion between the joints.</p>	<p>someone has RA, they are more likely to develop other issues such as liver or high blood pressure, thus taking more medications. Studies have shown that people with RA are more likely to develop a perforation related to all of the maintenance that comes with it related to the medications. (Frontiers)</p>
<p>Hyperlipidemia</p>	<p>Hyperlipidemia is a disease that causes abnormally high levels of fat and cholesterol in the blood stream.</p>	<p>This can correlate with a bowel perforation according to this article by, "... spontaneous occurrence of cholesterol embolization syndrome causing small bowel obstruction and perforation" (National Library of Medicine). This means that the levels of fat in the blood got too large leading to increased pressure which contributed to the perforation.</p>
<p>Hypertension</p>	<p>Hypertension is high levels of pressure in the blood, over 140/90, for a long period of time.</p>	<p>This can correlate with a perforation due to the high pressure leading to weakening the walls of the intestine leaving them more likely to suffer a rupture.</p>

8). Prioritize nursing interventions related to current diagnosis (Bowel Perforation With Repair).

1. Assess pain level q4hours and PRN to keep the patient comfortable
2. Assess Vital Signs q4hours to monitor for any signs of worsening or change in condition
3. Assess Integumentary System q4hours (wounds/sutures) to monitor the healing process and for any signs of skin breakdown
4. Assess NG tube placement q4hours and PRN to ensure proper suctioning of gastric contents to promote healing
 - a. Ensure intermittent suction is initiated
5. Assess Gastric Contents PRN to monitor for sings of infection or increased bleeding
6. Assess JP drain q4hours and PRN to ensure extra fluid is being taken off and for any changes in secretions that could signify infection

7. Assess GI system q4hours to monitor for signs of constipation or increased GI bleeding
8. Assess GU system and foley catheter q4hours and PRN to ensure proper kidney function that could be impaired due to digested blood
9. Assess Lab Draw Values, Diagnostics, and Imaging as they are done and PRN to monitor for changes in the body that are not visible
 - a. Hgb for sign of blood loss/bleeding
 - b. HCT for sign blood loss/bleeding
 - c. WBC for an early sign of infection
 - d. Stool sample results for occult blood
 - e. X-Ray for NG tube placement
10. Administer medications to manage current symptoms and previous diagnoses
 - a. Amlodipine 5mg PO Daily
 - b. Pantoprazole 40mg IV Push Daily
 - c. Pregabalin 25mg PO Daily
 - d. Ropinirole 0.5mg PO Daily
 - e. Enoxaparin 30mg SC Daily
 - f. Hydromorphone 0.5mg IV Push PRN for pain >8/10
 - g. Ondansetron 4mg IV Push PRN for nausea
 - h. Lactated Ringers 1000mL @75mL/hour for fluid replacement
11. Maintain NPO status in order to prevent injury to the surgical site
12. Perform dressing change daily to prevent infection and monitor for s/s of infection
13. Monitor I/O's PRN to ensure proper kidney function
14. Assist and encourage patient with ambulation or exercising daily and PRN as to regain strength, prevent constipation, and prevent DVT formation
15. Educate on gastric ulcer prophylaxis (why she is getting pantoprazole) PRN so that way the patient is informed on new medications
16. Educate on importance of JP drain and how it drains fluid from the body PRN so that way the patient can understand what it is for
17. Educate on proper hydration and dieting PRN as to prevent another bowel perforation and maintain adequate nutrition
18. Educate on safe ambulation PRN to prevent another fall that can contribute to bowel perforation

9). Discuss the role of the interdisciplinary team members in the care of the patient.

Who?	What they do	Correlation
Wound (On)	Wound care deals with the wounds that patients come in with and how they should properly be dressed. They also assess if there are any	My patient had abdominal surgery which led to her being bed bound for some time. They were consulted to assess her and make that she

	pressure injuries starting and what we can do to manage them.	did not develop any injuries while she was on bed rest.
General Surgery/Surgeon (On)	A general surgeon does what are considered general surgeries for a wide variety of problems, not speccific surgeries like a neurosurgeon or a vascular surgeon.	My patient needed this surgeon on because he was the one in charge of her care after her surgery and the one who did her surgery. So, he decides how to treat her based on what he performed.
RN/SN (On)	The bedside nurse performs majority of the care for the patient such as evaluating, assessing, and teaching the patient during their time caring for a patient. They also implement orders that are put in place by the physician.	It was vital that my patient had a nurse to care for her during her recovery period. If she were to have gone home and recovered, which would have been impossible, she would have a really difficult time with her healing. As the student nurse caring for her, I assessed her current state, talked with her about her current mental state, ensured that she was receiving the right medications, and making sure that she was getting proper care overall.
PT/OT (Recommended)	Physical and occupational therapy help the patient with regaining strength, proper body mechanics, and helping them with the ability to do ADL's	I would recommend PT/OT because my patient was having some weakness due to her surgery, and it would be helpful for her to have some help to regain her strength because she lives at home. I also think that she could use some help with things such as bathing, dressing, and overall, just caring for herself since she does struggle a little more due to her age with getting around the house. With having both physical and occupation therapy, she would be able to regain the strength she lost and be able to be safer around her home.
Speech (Recommended)	Speech therapists deal with	I think that my patient would

	how a patient speaks, with feeding and swallowing skills, and language.	benefit from speech therapy because with her having the NG tube, she has been having some difficulty with swallowing which is more than likely related to the trauma from having it inserted. This would allow her to safely get back to eating and drinking normal foods once the NG tube could be removed.
Respiratory Therapy (Recommended)	Respiratory therapists help with patients who are experiencing respiratory issues that can cause breathing difficulty.	My patient had developed shortness of breath due to the amount of blood loss from the perforation in her bowel. This caused her to have difficulty breathing and needing to be put on oxygen. I think that respiratory therapy would help her to be able to be weaned off oxygen, so she did not have to be sent home on it.

Citations:

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