PedsCases Podcast Scripts

This is a text version of a podcast from Pedscases.com on the "Acute Abdominal Pain in Children." These podcasts are designed to give medical students an overview of key topics in pediatrics. The audio versions are accessible on iTunes or at www.pedcases.com/podcasts.

Acute Abdominal Pain in Children

This podcast was developed by Peter MacPherson and Dr. Melanie Lewis for PedsCases.com.
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Introduction:

Peter: Hi everyone, my name is Peter MacPherson and I'm a medical student at the University of Alberta. I'm joined today by Dr. Mel Lewis. Dr. Lewis is a general pediatrician and an Associate Professor of Pediatrics at the Stollery Children's Hospital and University of Alberta in Edmonton. She is also the Pediatrics Clerkship Director.

Today, we're going to be talking about acute abdominal pain in children. Now, this is a huge topic, and to list all the causes of acute abdominal pain in kids would probably take the whole podcast. So we're going to focus on giving you a general approach. Chronic abdominal pain is covered in a different podcast.

Dr. Lewis: Sounds good. This topic can seem daunting for students, but a good history and physical exam will get you most of the way to the diagnosis. We'll see that many causes of abdominal pain can be differentiated by the company they keep -that is, their associated findings on history and physical. So we would expect very different findings in streptococcal pharyngitis and testicular torsion, but both can cause abdominal pain.

History:

Peter: Why don't we get started? What should students be asking children and their parents on history?

Dr. Lewis: Before you speak with the family, you can already narrow down your differential based on the age of child. For instance, an adolescent girl could have a torted ovary, ectopic pregnancy, or PIO. At toddler on the other hand is more likely to have an intussusception, gastroenteritis, or simple constipation. Some diagnoses like appendicitis span all the age groups including infancy.

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Peter: But an ectopic would probably not be at the top of your differential for a three year old boy.

Dr. Lewis: Exactly.

You'll want to ask about the location and nature of the pain. Remember that you may not get answers to some of these questions depending on the child's age.

Remember that pain in the abdomen can be visceral, somatic or referred. In the case of visceral pain, pain from the foregut localizes to the epigastric area. Pain from the midgut structures localizes to the periumbilical region. Pain from the hindgut is felt in the suprapubic area.

The location of the pain can help you. For example, pain in the right upper quadrant could result from hepatobiliary problems, a right lower lobe pneumonia or a kidney or urinary tract problem. And so there is a different differential diagnosis for pain in different areas of the abdomen.

You should also ask about onset, duration, things that make the pain better or worse, radiation of the pain, severity and timing. With regards to onset: did the pain start suddenly or has it been increasing gradually over hours or days? With regards to timing: is the pain intermittent or is it constant? Is the pain interfering with activities?

In many cases, there is a typical pattern pain with a particular condition. For example, intussusception generally presents with intermittent crampy pain that is most often periumbilical but can be in the right lower quadrant.

Peter: So aside from a detailed pain history, what else should students ask about?

Dr. Lewis: When we're talking about abdominal pain, you always want to ask about vomiting and bowel movements.

Let's start with vomiting. The presence, nature and timing of vomiting can be significant If vomiting is bilious, this would suggest an intestinal obstruction or midgut volvulus. If there was bright red blood in the vomit, it could be esophagitis, gastritis, an esophageal tear, esophageal varices, or an ulcer. Vomited food or gastric contents would be consistent either with gastroenteritis or an obstruction. Feces in the vomit suggests obstruction.

Timing is also important. Here is a clinical pearl: In general, if pain precedes vomiting, it is a surgical cause of abdominal pain. If the pain started after vomiting, it is more likely to be a medical cause of abdominal pain.

Peter: And what should students ask about bowel movements?

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Dr. Lewis: As far as the stool goes, they should ask about frequency, colour and consistency of stool and inquire about any blood in the stool.

Watery diarrhea can be seen in infectious gastroenteritis or in some cases of appendicitis. A hard or large stool, with decreased stool frequency is typical of constipation.

Remember that constipation is a very common cause of abdominal pain in children. Constipated children can trick you as they often poop every day but it's literally the tip of a very, very large iceberg.

A small amount of bright red blood could be indicative of constipation, infectious colitis or inflammatory bowel disease, Henoch·Schonlein purpura or polyps. A large volume of red blood would indicate IBO, infectious colitis or polyps. In infants, cows milk intolerance can cause streaks of blood in the stool.

'Red currant jelly stool' is classically described as a finding in intussusception, but it is not present in all cases, and in fact is a late finding. That means that the absence of red currant jelly stool doesn't rule out intussusception.

Melena would suggest a gastric or duodenal ulcer. Pale, alcoholic stools would indicate hepatobiliary disease.

In the case of obstipation, which means no passage of flatus or stool, you would think about an intestinal obstruction.

Peter: So we have covered the pain itself, vomiting and bowel movements. What else should we ask about on history?

Dr. Lewis: You should ask about any trauma to the abdomen.

Also ask about urinary symptoms. Dysuria, urinary urgency and malodorous urine may mean that the child has a urinary tract infection. A history of preceding polyuria and polydipsia may mean that this is a case of diabetic ketoacidosis. Smoke coloured urine could indicate Henoch-Schonlein purpura.

On that note, you should also ask about joint pain and rash. Henoch-Schonlein purpura presents with joint pain, a purpuric rash, and abdominal pain. It should be noted that the abdominal pain can occur before the rash, so the rash may not be present when you see the child. After the classic palpable purpura shows up, the diagnosis is easy.

You should also inquire about cough, shortness of breath or chest pain, which would indicate a thoracic origin of the pain.

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For adolescent girls, you should ask about menstrual history, sexual activity and contraception with the parents out of the room. A history of an IUD and multiple partners could suggest pelvic inflammatory disease. Secondary amenorrhea could indicate pregnancy.

Peter: What about other questions on history?

Dr. Lewis: You should ask if there has been a history of similar pain. If so, it would suggest a recurrent or chronic problem rather than a new-onset, acute issue.

A personal history or family history of sickle cell anemia, or African ethnicity, might suggest a sickle cell crisis. A family history of cystic fibrosis should also be sought out.

A past abdominal surgery could suggest a bowel obstruction caused by adhesions, or could effectively rule out a condition (for example, an appendicitis can be ruled out by a past appendectomy).

Ask also about medications as some drugs can cause abdominal pain.

Last, ask whether similar symptoms are present in family members or other contacts (for example, the other kids at daycare), which would suggest food poisoning or gastroenteritis.

Physical Exam:

Dr. Lewis: Sure. The first thing to consider is whether the child looks sick. If they look seriously ill, they most likely are. A child who can hop up and down from the exam table and can walk without bending at the waist probably doesn't have peritonitis.

As always, vitals are important. Is the child febrile? Look for signs of hypovolemia and assess their fluid status.

Also look for hypertension, which could suggest hemolytic uremic syndrome or Henoch-Schonlein purpura Kussmaul's breathing, which is deep and laboured breathing, is seen in DKA.

Peter: So the patient's general appearance and vitals matter a great deal. What else can you tell us?

Dr. Lewis: You can demonstrate peritonitis and rebound tenderness simply by gentle percussion. Demonstrating rebound by deep palpation is unnecessary and inhumane.

Rovsing's sign is sensitive and specific for appendicitis. A positive Rovsing's sign is where you press on the left lower quadrant and pain is felt in the right lower quadrant. You should also do the iliopsoas and obdurator tests in suspected appendicitis.

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A positive Murphy's sign suggests acute cholecystitis. As we already talked about, purpura and arthritis suggest Henoch-Schonlein purpura. The presence of jaundice suggests hemolysis or liver disease.

You should also look at the external genitalia.

Rectal and pelvic examinations are not required in all children with an acute abdomen. These should only be performed when you expect them to yield useful information and change your management. In cases of diagnostic uncertainty, a DRE can tell you about tenderness, sphincter tone and you can look for melena, masses or stool. A pelvic exam can be helpful in adolescent girls who may have PID.

Repeated examinations by the same examiner over the course of a few hours can clear up the diagnosis in some cases of diagnostic uncertainty.

Investigations:

Peter: Fantastic. Let's move on to investigations in acute abdominal pain.

Dr. Lewis: Sure. This is a scenario where a shotgun approach to labs and imaging is not warranted.

Judicious investigations that will actually affect your management should be considered

Good baseline investigations for everyone would be a complete blood count and differential and urinalysis. For adolescent girls, you should add a beta-hCG regardless of the history of sexual activity.

Other investigations can be helpful depending on your clinical suspicion:

- Ultrasonography can be used for appendicitis, intussusception and ovarian torsion. Doppler ultrasonography can be used in the work-up of testicular torsion if, and only if, the diagnosis is not clear.
- An air-contrast enema will be both diagnostic and therapeutic for instussusception.
- An abdominal X-ray is useful in constipation, intestinal obstruction or a perforated viscous.
- An upper GI study with contrast can demonstrate a small bowel volvulus.
- A spiral CT scan can be used in some cases of suspected appendicitis, but most centers use ultrasonography as the first-line investigation.

Peter: Alright, so good investigations to order in all children with acute abdominal pain are a CBC plus differential and urinalysis, and we would add a beta-hCG for adolescent girls.

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The last thing we are going to cover in this podcast are indications to consult surgery. What would those be?

Dr. Lewis: Indications to consult a surgeon in a case acute of abdominal pain include:

- a history of abdominal trauma
- pain worsening with movement
- involuntary guarding
- rebound tenderness
- tenderness with percussion
- bile-stained or feculent vomitus
- marked abdominal distention with diffuse tympany
- Signs of acute blood loss or fluid loss into the abdomen
- Lastly, any abdominal pain that is severe or worsening with signs of deterioration.

Take home points:

Peter: Ok. Dr. Lewis, would you like to finish off the podcast by giving the students some take-home points?

Dr. Lewis: Consider the differential diagnosis before you step in the room and think about the appropriate patient script you expect for each presentation and age group.

Seek out red flags that would lead to further investigation and consultation. Remember this may be an acute presentation of a chronic problem. You have no idea how many kids with chronic constipation show up in the ED!

Here is a list of crucial red flags to seek out in your history:

1. Weight loss and appetite change
2. Pain that awakens the child at night
3. Child is up in the night to stool
4. Increased frequency of stool for more than 1 month
5. Blood in stool and emesis
6. Pain that prevents child from participating in fun activities: like sports, play and activities with friends. Missed school is a much more complex differential diagnosis.
7. The Signs and Symptoms of an acute abdomen are usually obvious: vomiting with no diarrhea, rigid belly and a sick patient!
8. Appendicitis, while common, is a difficult diagnosis especially early on. Look hard for peritoneal signs. Did the patient complain of the bumps on the car ride over? If a child can hop pain free, it is very unlikely that they have peritonitis. Also, has there been a change in appetite? It is very rare for a patient with an acute appendicitis to have a good appetite.

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9. And finally, when the diagnosis is not certain and you are sending the child home, ensure the families know to come back if symptoms progress or the child appears sicker. Many cases of appendicitis are caught the second time around.

Peter: Well, that wraps up our podcast. Thanks for listening.

References:

References available upon request.

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