

PedsCases Podcast Scripts

This is a text version of a podcast from PedsCases.com on “**Pediatric Inguinal Hernia.**” 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.pedsCases.com/podcasts.

Pediatric Inguinal Hernia

Developed by Kevin Verhoeff, Dr. Simon Byrns, and Dr. Bryan Dicken for PedsCases.com.
October 4, 18

Introduction:

Hi everyone, my name is Kevin Verhoeff and I am a third-year medical student at the University of Alberta. This PedsCases podcast is designed to give you an understanding and management approach to an important pediatric surgery topic, pediatric inguinal hernias. While you may see many inguinal hernias throughout medical school and residency, it is important to understand the key differences between adult and pediatric inguinal hernias.

This podcast was created with Dr. Simon Byrns, a surgical resident at the University of Alberta, and staff pediatric surgeon, Dr. Bryan Dicken

Clinical Case:

Let's start with two clinical cases to help you compare and contrast pediatric inguinal hernias to adult inguinal hernias:

First, an adult case: You are a third year medical student completing your family medicine rotation at a clinic in Northern Alberta. After completing a thorough history and physical exam you present the following patient to your preceptor:

“Mr. Jones is a 60-year-old male presenting to the clinic for a bulge in his right groin. He noticed it while taking off his pants after a long day of heavy lifting on the farm. The bulge seems to pop out 1-2 times per week when he is lifting heavy items or is constipated and straining to stool. When this occurs, Mr. Jones says he easily pushes the lump back into his body without pain, because he thinks he has a hernia and that's what his friend did with his hernia. Otherwise, Mr. Jones does not notice any pain, skin changes over the lump, or change in his bowel habits when the lump is present and he has never had episodes of abdominal distention, nausea or vomiting or inability to pass gas. The lump has never been stuck out or difficult to push back in. Mr. Jones is obese and a smoker, but otherwise healthy and has no previous surgical history.” Physical exam is unremarkable, except when I examine Mr. Jones while standing, I can feel a soft mass protrude against my fingers in the right inguinal area when Mr. Jones coughs forcibly.”

Let's move on to a pediatric case: Your next patient is pediatric patient presenting to the clinic for his well-child checkup. You enter the room, complete your pediatric history and physical exam and return to your preceptor with the following story:

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“Joseph is a 25-day old boy presenting for his well-child checkup. He was born at 39+6 to a 28-year-old mom who had been followed by this clinic for her prenatal care. Prenatal history was unremarkable, normal first trimester screen, normal echocardiograms, no maternal diabetes or hypertension, appropriate nutrition and prenatal vitamins. Joseph was born via spontaneous vaginal delivery, group B Strep negative, and did well after birth with no resuscitation and passed meconium within 24 hours. They went home on the first day after birth. During his first few weeks of life he has been exclusively breast fed, and is now well above his birth weight. Mom has no major concerns and appears to be doing well but did notice a bulge in Joseph’s right inguinal area when changing his diaper yesterday. Your exam was unremarkable except for a notable bulge in Joseph’s right scrotum and inguinal area consistent with a hernia. There is no skin break down, the hernia is reducible and after asking mom about pain or irritability, bowel movements, and if this lump ever gets stuck out, there appear to be no concerning features.

There are four main objectives of this podcast:

By the end of this podcast you will be able to:

1. Describe the mechanism and pathophysiology of pediatric inguinal hernias.
2. Outline common risk factors for pediatric inguinal hernias.
3. List the red flags of adult and pediatric hernias that require emergent care.
4. Explain the reasoning for different management between pediatric and adult inguinal hernias.

So, let’s continue this real-world situation with some very common questions you might be faced with:

After presenting both cases to your preceptor she asked you the following questions:

So, two hernias in a row... What is a hernia?

Well, I know there are lots of hernia types and each one is managed differently. Most of them are described by their anatomical location such as umbilical hernia, inguinal hernia, diaphragmatic hernia, and many others. A hernia is the protrusion of tissue or an organ through a wall of a cavity in which it normally resides. I wanted to say an organ pushing through an abdominal wall muscle but when you think about it, there are brain hernias, lung hernias, even herniation of heart muscle.

Why did Mr. Jones get a hernia? What about Joseph, why did he get a hernia?

Well, Mr. Jones probably got a hernia because he was straining and the increased abdominal pressure eventually stretched his fascia leading to a weakness in the inguinal ring or Hasselbach’s triangle. Eventually, the weakness got to the point where some abdominal fat or bowel was able to herniate through and cause the lump that I could feel. Thinking back to his story he has a lot of risk factors including: being male, smoking, and a history of constipation. He is also at risk due to repeated heavy lifting with work.

Joseph is a tougher one... I think it has something to do with embryology but that is not my forte. He isn’t obese, doesn’t have a cough, isn’t straining, so I don’t know.

Ok, so let's work our way through it then. Where do testicles begin development in-utero?

Oh, right! The testicles begin in the abdomen and move downwards with the help of the gubernaculum. So Joseph's testicles migrated downwards into the scrotum but there must be a persistent communication between the scrotum and the peritoneum or abdominal cavity

Right, the testicles normally descend and then the processus vaginalis closes or fuses and obliterates the connection between the abdomen and the scrotum. This also helps us understand why it is more likely that inguinal hernias occur on the right side; 60% of inguinal hernias occur on the right because the right processus vaginalis closes later than the left. This is also why inguinal hernias are more common in males. Don't let that fool you though, inguinal hernias can occur in females as well, including for young girls, and are still the most common pediatric hernia in both sexes.

So how do we know that these are hernias? Do we need to get imaging?

No imaging is required, a good history and physical exam is all that is required to make the diagnosis. Imaging is not indicated as frequently the hernias aren't protruding at the time of ultrasound, leading to a false-negative test, and alternatively very small clinically insignificant hernias may be noted that only result in parental distress¹.

Great! One last question, what are we going to do with these two cases?

Case Conclusion:

Well, my general surgery clerkship taught me that watchful waiting is a good option for Mr. Jones. We can talk to him and see what he thinks but because he has no pain, no signs of incarceration, and it is not impacting his life significantly we can continue to watch and follow up with him. The big reason for this is because the risk of having chronic pain after inguinal hernia surgery is greater than the chance of the hernia becoming incarcerated².

Ok, but we must warn him of things to watch out for. Mr. Jones should be aware that he should seek urgent medical care if: his hernia gets stuck and is not easily reducible (also known as incarceration), starts to get red, hot, develops skin ulceration, or changes color from lack of blood supply (also known as strangulation), or if he gets distended, develops pain, or he stops having bowel movements and passing gas, which could be a sign of bowel obstruction.

Ok, and for Joseph I think he needs a referral to a pediatric surgeon, but I'm not sure why.

That's exactly the right management. Joseph's hernia should not be managed the same as Mr. Jones's. Pediatric hernias will not resolve spontaneously and they have a much higher risk of becoming incarcerated. The Canadian Association of Pediatric Surgeons suggests having inguinal hernias repaired as soon as possible with urgent referral to a pediatric surgeon. For preterm children, the risk is even greater and they suggest that inguinal hernias be repaired within 2 weeks of diagnosis, many of these are repaired during their admission to the neonatal intensive care unit³.

Summary:

Ok, so before we go back in and talk to Mr. Jones and Joseph's family, let's review:

1. For adults, inguinal hernias occur due to chronic increased pressure that weakens the fascial layers and leads to a protrusion. In kids, inguinal hernias occur because of an embryological patent processus vaginalis.
2. Pediatric inguinal hernias are more common in first born males, those with a family history of pediatric inguinal hernias, in preterm infants, males with cryptorchidism, and in patients with connective tissue disorders⁴.
3. Red flag symptoms include: if the hernia gets stuck out (also known as incarceration), starts to get red, hot, develop skin changes (also known as strangulation), or if the patient gets bloated, has abdominal pain, and stops having bowel movements, which could indicate a bowel obstruction.
4. For adults with asymptomatic inguinal hernias the recommendation is watchful waiting with awareness of red flags. This is because the chance of chronic pain from inguinal hernia repair is greater than the chance of incarceration. However, for kids, all inguinal hernias need to be repaired semi-urgently because they have a higher chance of becoming incarcerated, kids cannot inform us of the symptoms, and because of the anatomical cause for their hernia, they will not close spontaneously.

References:

1. LeBlanc KE, LeBlanc LL, LeBlanc KA. Inguinal hernias: diagnosis and management. Am Fam Physician [Internet]. 2013 06 [cited 2018 May 27]; 87(12): 844-848. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/23939566>
2. Jenkins, JT, O'Dwyer, PJ. Inguinal hernias. BMJ [Internet]. 2008 02 [cited 2018 May 27]; 336(7638): 269–272. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2223000/>
3. Poenaru, D. Inguinal hernias and hydroceles in infancy and childhood: A consensus statement of the Canadian Association of Paediatric Surgeons. Paediatrics & Child Health [Internet]. 2000 11 [cited 2018 May 27]; 5(8): 461–462. Available from: <https://doi.org/10.1093/pch/5.8.461>
4. Rescorla, FJ, Grosfeld, JL. Inguinal hernia repair in the perinatal period and early infancy: Clinical considerations. Paediatr. Child Health [Internet]. 1984 12 [cited 2018 May 27]; 19(6): 832–837. Available from: [https://www.jpedsurg.org/article/S0022-3468\(84\)80379-6/abstract](https://www.jpedsurg.org/article/S0022-3468(84)80379-6/abstract)