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Meckel's Diverticulum

Patient and family information, brought to you by the Education Committee of APSA

Overview - "What is it?"

Meckel's diverticulum is a condition where there is a congenital (baby was born with it) outpouching of the small intestine. It is a remnant of a normal structure (vitelline duct) present in all babies as they develop inside their mothers. This structure usually disappears completely before the baby is born.

Meckel's diverticulum affects about 1-3% of the population, but most of the time, they do not cause symptoms. They are also known as 'the great mimickers' because they can act like many other problems.

Meckel's diverticulum is an isolated occurrence in most children, but it can be associated with other conditions such as omphalocele, esophageal or duodenal atresia, imperforate anus, and congenital heart disease.

Signs and Symptoms - "What symptoms will my child have?"

Bleeding: Meckel's diverticulum can have stomach tissue within it. Stomach tissue makes acid causing an ulcer which can bleed or result in a hole (perforation). The amount of bleeding from a Meckel's diverticulum can cause child to have bloody stools without associated abdominal pain. If the blood loss is severe, the child may have a fast heart rate, low blood pressure, or appear sleepy. Meckel's diverticulum account for about 50% of bloody stools in pediatric patients.

Obstruction: Meckel's diverticulum can be attached to the abdominal wall and be a focal point for intestine to twist around. It can also become inflamed and cause intussusception of the intestine. Nausea and vomiting, along with pain and a distended belly may be present. This is the most common symptom in older children and adults.

Inflammation/infection: They can become inflamed if the inside becomes blocked. This will cause distention of the diverticulum and cause the child belly pain. If the blockage and distension continue, the diverticulum can become infected. They may be mistaken for appendicitis, but the appendix is normal on imaging studies. The patient may have a fever.

Perforation: A hole can result in a Meckel's diverticulum if the inflammation of the diverticulum outgrows its blood supply. Fever and abdominal pain may be seen.

Diagnosis - "What tests are done to find out what my child has?"

Labs and tests: Blood count (CBC) will be checked if the child has bleeding. In a vomiting child, levels of electrolytes will be checked to see how bad their dehydration is.

Abdominal x-ray: In cases of belly pain, a plain x-ray of the belly may be performed first. Dilated small intestine can be a sign of obstruction.

Meckel's Scan or Technetium 99m pertechnetate nuclear medicine scan: When children present with painless bleeding from the bottom, there can be high suspicion for Meckel's diverticulum. In this test, a small amount of radioactive material is injected in the vein, and stomach tissue will light up on the scan. Stomach tissue is the most common cause of bleeding in Meckel's diverticulum. Occasionally, the nuclear scan does not perfectly visualize the stomach tissue.

CT scan/MRI/ultrasound: May be performed and can identify Meckel's diverticulum, but are typically performed if other causes are expected.

Treatment - "What will be done to make my child better?"

Medicine: The initial treatment for patients with a bleeding Meckel's diverticulum is IV fluids for dehydration, and occasionally blood transfusion. If the Meckel's diverticulum causes infection, perforation or obstruction, antibiotics will be given.

Surgery: Surgery is offered for Meckel's diverticulum if it is causing the above symptoms, or if Meckel's diverticulum is highly suspected but the Meckel's scan was not 100% diagnostic. The Meckel's diverticulum is removed during surgery. It may also require removing part of the small intestine next to the diverticulum and drainage of infected fluid if perforation happened. Surgery can be done using an open or laparoscopic techniques.

Open surgery: The operation is done using a single vertical cut on the abdomen.

Laparoscopic surgery: Several small cuts (incisions) are made. Through one of the cuts, a video camera is placed. The surgery itself is done using small instruments placed through the other incisions. The usual number of incisions (cuts) for laparoscopic surgery can vary. One benefit of laparoscopy is that other abdominal structures can be examined using the video camera during surgery.

Preparation for surgery: Your child will be given IV fluids, antibiotics, and pain medicine prior to surgery.

Postoperative care:

Activity: Typically, the child is encouraged to walk around as soon as possible.

Diet: Once function of the intestine returns (as evidenced by passing gas and bowel movements), patients are started on liquids and advanced to their regular food if they tolerate liquids without nausea, vomiting or abdominal pain.

Medicines: Your child may need any of the following:

- **Antibiotics:** If there was infection in the operating room or sign of perforation, your child may be prescribed antibiotics post operatively.
- **Anti-nausea medicine:** To control vomiting (throwing up).
- **Pain medicine:** Pain medicine can include acetaminophen (Tylenol®), ibuprofen (Motrin®), or narcotics. These medicines can be given by vein or by mouth. Narcotics are usually not needed by the time your child is ready to go home.

Risks/Benefits: All abdominal surgeries have risks, including infection, bleeding and damage to nearby structures. Non-operative management is usually not an effective therapy for a bleeding Meckel's diverticulum, as the likelihood of recurrent symptoms is very high.

Home Care - "What do I need to do once my child goes home?"

Diet: Your child may eat a normal diet at home.

Activity: Your child should avoid strenuous activity and heavy lifting for the first 1-2 weeks after laparoscopic surgery, 4-6 weeks after open surgery.

Wound care: Surgical incisions should be kept clean and dry for a few days after surgery. Most of the time, the stitches used in children are absorbable and do not require removal. Your surgeon will give you specific guidance regarding wound care, including when your child can shower or bathe.

Medicines: Medicines for pain such as acetaminophen (Tylenol®) or ibuprofen (Motrin® or Advil®), and less likely something stronger like a narcotic may be needed to help with pain for a few days after surgery. Stool softeners and laxatives are needed to help regular stooling after surgery, especially if narcotics are still needed for pain.

What to call the doctor for: Worsening belly pain, fever (>101 F), vomiting, diarrhea, problems with urination, or if the wounds are red or draining fluid.

Follow up care: Your child should follow-up with his or her surgeon 2-3 weeks after surgery to ensure proper post-operative healing.

Long Term Outcomes - “Are there future conditions to worry about?”

Complications:

Wound infection: Happens ~3% of the time. Infections may need antibiotics or may require opening up the wound depending on severity of infection.

Small bowel obstruction: 3-5% risk in child’s lifetime.

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