Lateral Inguinal Hernia in a 13-Year-Old Child: A Case Report

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ABSTRACT

Background: Indirect inguinal hernia, particularly in children, is typically due to the failure of the processus vaginalis closure and is located lateral to the inferior epigastric vessels. Hernias are generally found in children aged 0-5 years, in premature infants, and in elderly individuals aged 75-80 years. In this case, however, the patient is 13 years old, an age that is considered uncommon for the manifestation of a congenital hernia. **Case**: A 13-year-old boy presented with a one-month history of an intermittent left scrotal bulge. Physical examination in the standing position revealed an elongated lump extending from the left inguinal region down to the left scrotum, which became more prominent during the Valsalva maneuver. The lump was spontaneously reduced when the patient was lying down. The lump had a soft consistency, well-defined margins, a smooth surface, and was reducible on pressure. Two similar-sized testes were palpable in the scrotum. The diagnosis was left indirect inguinal hernia; the patient underwent herniotomy without complications. Postoperative recovery was uneventful with no residual complaints. **Discussion:** Indirect inguinal hernias in children are generally caused by the persistence of the processus vaginalis and are characterized by a lump that appears when intra-abdominal pressure increases. Diagnosis is clinical, and the definitive treatment is surgery (herniotomy) due to the higher risk of incarceration. **Conclusion:** This case highlights the importance of early detection and appropriate management in the pediatric population to prevent complications such as incarceration or strangulation**.**

Keywords: Case report, incarceration, inguinal hernia, open inguinal hernia repair, pediatric.

ABSTRAK

Latar belakang: Hernia inguinalis indirek, khususnya pada anak, terjadi karena kegagalan penutupan processus vaginalis dan terletak lateral terhadap pembuluh epigastrika inferior. Hernia umumnya didapatkan pada usia 0–5 tahun, pada bayi prematur, serta pada lansia usia 75–80 tahun. Namun demikian, pasien pada kasus ini berusia 13 tahun, usia yang tergolong tidak umum untuk manifestasi hernia kongenital. **Kasus**: Anak laki-laki 13 tahun dengan keluhan benjolan hilang timbul pada skrotum kiri sejak satu bulan yang lalu. Pemeriksaan fisik saat posisi berdiri terlihat benjolan lonjong dari inguinal kiri hingga skrotum kiri yang makin menonjol dengan *Valsalva test.* Saat berbaring, benjolan bisa dimasukkan kembali. Benjolan teraba kenyal, berbatas tegas, permukaan licin, dan reponibel saat ditekan. Testis teraba 2 buah dengan ukuran sama di skrotumnya. Diagnosis hernia inguinalis indirek sinistra; pasien menjalani prosedur herniotomi tanpa komplikasi. Pemulihan pascaoperasi baik tanpa keluhan lanjutan. **Pembahasan:** Hernia inguinalis indirek pada anak umumnya disebabkan oleh persistensi processus vaginalis dan ditandai benjolan yang muncul saat peningkatan tekanan intraabdomen. Diagnosis bersifat klinis dan tata laksana definitif adalah pembedahan (herniotomi) karena risiko inkarserasi lebih tinggi. **Simpulan**: Laporan kasus ini menekankan pentingnya deteksi dini dan intervensi tepat pada populasi anak, untuk mencegah komplikasi seperti inkarserasi atau strangulasi. **Felicia Vivian Nowi Putri, Dave Edgar, Sonya Hedva Sharon, Daniel Ardian Soeselo. Hernia Inguinalis Lateralis pada Anak 13 Tahun: Laporan Kasus.**

Kata Kunci: Laporan kasus, inkarserasi, hernia inguinalis, operasi perbaikan hernia inguinalis terbuka, anak.

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INTRODUCTION

A hernia is an abnormal protrusion of an organ or tissue through an opening or weakness in the surrounding wall.[1] This condition is most commonly found in the abdominal wall, particularly in the inguinal region, which accounts for approximately 75% of all abdominal wall hernias.[1,2] Inguinal hernias are divided into two main types: indirect inguinal hernias and direct inguinal hernias. An indirect inguinal hernia occurs when the hernia sac passes through the internal inguinal ring, then travels obliquely toward the external inguinal ring, and in many cases may descend into the scrotum. In contrast, a direct inguinal hernia protrudes straight forward through the posterior wall of the inguinal canal, specifically medial to the internal inguinal ring

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and the inferior epigastric vessels.[1,3]

Indirect hernia is the most common type of inguinal hernia, accounting for 66% of all inguinal hernias.[1,4,5] This condition is frequently found in children and young adults, which is associated with the congenital failure of closure of the processus vaginalis. Normally, during fetal development in the third trimester, the testes descend from the abdominal cavity into the scrotum with the help of a structure known as the gubernaculum.[2,5,6] This process occurs through an outpouching of the peritoneal layer that forms the processus vaginalis, which passes through the inguinal canal. The processus vaginalis typically closes between 36 to 40 weeks of gestation, sealing the peritoneal opening at the internal inguinal ring. If this closure fails, a condition known as a patent processus vaginalis (PPV) develops.[2,5,6] In general, although PPV may be present, the risk of it progressing into a symptomatic hernia in children remains low.[2,4,5]

Patients with inguinal hernia often complain of a lump that increases in size over time; pain or discomfort is also commonly reported. As the condition progresses, the hernia may remain reducible, meaning the hernia contents can be returned to the abdominal cavity, or become irreducible, in which case the contents cannot be returned. It may even progress to incarceration, a condition in which the intestine becomes trapped, which can be potentially fatal.[1,5] Therefore, appropriate diagnosis and management are essential to prevent more severe complications.

Hernias are most common in children aged 0–5 years, premature infants, and elderly individuals aged 75–80 years.[7] In this case, the patient is 13 years old, an age that is considered uncommon for the manifestation of a congenital hernia. This condition may occur due to the reopening of the processus vaginalis with a sufficiently large diameter, allowing intestinal protrusion as a result of increased intra-abdominal pressure, which may be associated with increased physical activity. This case emphasizes the importance of considering risk factors beyond the failure of processus vaginalis closure in the occurrence of hernia in children. The atypical age of onset highlights the need for vigilance in diagnosing hernia outside the commonly reported age range.

CASE

A 13-year-old boy presented with his mother and was referred to the Surgery Department from the Pediatrics Department with a complaint of a lump in the left scrotum for the past 1 month. The lump was particularly noticeable when standing, straining, or engaging in physical activity, and it decreased in size or disappeared when lying down. The lump was not painful but caused a sensation of discomfort. Other symptoms such as fever, nausea and vomiting, headache, urinary disturbances, abdominal pain, shortness of breath, and weight loss since the onset of the lump were denied. The patient also denied any history of medication use, allergies, or family medical history. He was born at term with a normal birth weight.

The patient rarely consumes vegetables and fruits; however, his bowel movements are regular, occurring almost daily, and he rarely experiences constipation. The patient carries a relatively heavy school bag every day, according to both him and his parents. His classroom is located on the second floor, requiring him to go up and down the stairs daily. He has routinely participated in sports such as soccer and badminton since the fifth grade of elementary school and continues to do so now in the first year of junior high school.

On physical examination, the patient's body weight was 35 kg, and his height was 147 cm, with a body mass index (BMI) of 16.2 kg/m², which is considered normal according to the WHO Asia-Pacific classification.[8] When the patient was standing, a lump was observed in the left inguinal region extending into the left scrotum, with skin color similar to the surrounding area. There were no visible wounds, discharge, or venous dilatation. On palpation, the mass was elastic, oval, well-defined, and mobile. When lying down, the lump may reduce spontaneously or with pressure. On testicular examination, both testes were palpable within the scrotum and were of normal size. Other physical examination findings were within normal limits. Hematological laboratory examination results are presented in the **Table**.

The patient was diagnosed with an uncomplicated left lateral inguinal hernia. An open inguinal hernia repair procedure was planned for the left inguinal region. The patient was discharged one day after surgery without postoperative complications. He was advised to return for follow-up one week after the procedure.

DISCUSSION

Inguinal hernia is a pathological condition characterized by an opening in the oblique and transverse abdominal muscles, allowing herniation of intra-abdominal or extraperitoneal organs.[5] Based on location, inguinal hernias are classified into indirect and direct types. Indirect inguinal hernia, which is more commonly found in the pediatric population, including this case, is caused by the failure of closure of the processus

Table. Laboratory examination results.

Examination	Results	Unit	Reference Value
Hb	14.3	g/dL	13.5–17.5 gr/dL
Ht	42.3	%	35.4–44.4
Leukocyte	7.65	$10^3/mm^3$	3.54–9.06
Erythrocyte	4.74	million/uL	4.3–5
Thrombocyte	330.0	thousand/uL	165–415
MCV	89.2	fL	79.0–93.3
MCH	30.2	pg/dL	26.7–31.9
MCHC	33.8	g/dL	32.3–35.9

Abbreviations: Hb: Hemoglobin; Ht: Hematocrit; MCV: Mean corpuscular volume; MCH: Mean corpuscular hemoglobin; MCHC: Mean corpuscular hemoglobin concentration.

vaginalis, which should normally undergo spontaneous obliteration after testicular descent. An indirect inguinal hernia protrudes through the internal inguinal ring along the inguinal canal toward the external inguinal ring. Its location is lateral to the inferior epigastric vessels, distinguishing it from a direct hernia, which appears medial to these structures, specifically through Hesselbach's triangle.[1]

In children, an indirect inguinal hernia has a strong congenital etiology. The primary cause of this condition is the persistence of the processus vaginalis (PPV), a peritoneal channel that normally closes physiologically between 36–40 weeks of gestation. In male pediatric patients, the pathway of testicular descent through the inguinal canal increases the risk of hernia formation if the PPV remains patent.[5] Additional risk factors include prematurity, family history, and connective tissue disorders such as Ehlers-Danlos syndrome.[1,2,4]

The diagnosis of a hernia is primarily distinguished from other conditions that cause scrotal swelling, such as hydrocele, epididymitis, and retractile testis. A hydrocele is a condition characterized by an abnormal accumulation of serous fluid within the tunica vaginalis of the testis.[9] Transillumination test can help differentiate the contents of the scrotum, allowing these conditions to be distinguished on physical examination.[10]

During history-taking, it is important to identify the lump's characteristics, particularly enlargement on standing, coughing, or straining, and disappearance in the supine position. Patients usually do not complain of pain, which helps distinguish this condition from epididymitis and from complications of hernia, such as incarceration and a strangulation.[11] Physical examinations should be performed in both standing and supine positions, with the Valsalva maneuver used to provoke the appearance of the lump. In uncomplicated or reducible hernias, the lump will return spontaneously or with gentle pressure. In this case, a characteristic lump consistent with a lateral indirect inguinal hernia was found. Although the diagnosis of inguinal hernia in children is largely clinical, ultrasonography can help identify a patent processus vaginalis (PPV), determine the hernia contents, and exclude other possible inguinal masses. This examination is particularly useful in cases with minimal symptoms or when the diagnosis is uncertain.

Surgical intervention is the definitive treatment for an inguinal hernia. The most common indication for surgery is pain. Symptomatic hernias should be managed electively, whereas hernias with minimal or no symptoms may be observed with a watchful waiting approach.[4]

In children, however, early surgical repair is generally recommended because of the higher risk of incarceration compared to adults.[12] Emergency surgery is indicated when there is a threat of compromised intestinal blood flow (vascular compromise), such as in strangulated hernia. Clinical signs of strangulation include tenderness over the hernia mass, fever, leukocytosis, and hemodynamic instability, such as hypotension and tachycardia. Additionally, the hernia mass is typically warm, painful, and the overlying skin may appear erythematous or discolored. This condition may also be accompanied by symptoms of bowel obstruction, such as nausea, vomiting, and abdominal distension.[2,5]

In general, hernia management in children can be performed laparoscopically or by open surgery; to date, no significant difference in effectiveness or complication rates has been found between the two techniques.[13–15] Even in high-risk populations such as premature infants, open surgery has shown good outcomes with minimal complications.[16] There are variations in open surgical techniques, one of which does not involve opening the external oblique muscle, and this approach has been reported to have a shorter duration of surgery. In terms of complications and effectiveness, the results are similar to techniques that involve opening the muscle.[17]

Open surgical repair with herniotomy in children is performed through an inguinal incision, with layer-by-layer dissection to expose the inguinal canal, followed by identification of the hernia sac, which is typically a patent processus vaginalis.1 Once the hernia sac is identified, dissection is carried out up to the neck of the sac near the internal inguinal ring. The sac is then ligated and excised at its neck, without the need to reinforce the posterior wall of the inguinal canal, as the abdominal wall structures in children are generally still strong and elastic. This procedure does not require mesh placement, unlike in adult patients. After ligation of the hernia sac, the tissue layers are closed anatomically. Herniotomy is a safe and effective procedure with a low recurrence rate when performed with aseptic techniques and careful dissection.[1,5]

In patients with mild or minimal symptoms, clinicians must weigh the risk of hernia complications, such as bowel incarceration, against the short- and long-term risks associated with surgical intervention. Taxis (manual reduction of the hernia contents back into the abdominal cavity) should not be performed if there is suspicion of incarceration, as it may result in necrotic bowel being returned into the abdominal cavity, which can be fatal.[1,5] Patients with mild symptoms may be managed non-operatively, focusing on pain reduction by decreasing pressure. Lying in a supine position helps reduce protrusion due to gravity and the relaxation of the abdominal wall muscles. The use of a truss or hernia belt can help keep the hernia reduced and may relieve symptoms in approximately 65% of patients.[2,5]

CONCLUSION

Lateral or indirect inguinal hernia in children is a congenital condition caused by the persistence of an incompletely closed processus vaginalis, with clinical manifestations in the form of an intermittent lump in the inguinal region. Diagnosis is primarily established clinically through history taking and physical examination, and may be supported by ultrasonography when necessary. Emergency management is required in cases of incarceration or strangulation, while definitive treatment is achieved through herniotomy.

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