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Management of bilateral indirect inguinal hernia in a Pediatric patient: A case report

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Abstract
Background: Indirect inguinal hernia is one of the most common congenital surgical conditions in children. Bilateral occurrence, though less frequent, demands careful diagnosis and minimally invasive repair. The Percutaneous Internal Ring Suturing (PIRS) method offers a simple, effective alternative to conventional open herniotomy, with fewer complications and faster recovery.
Case Presentation: A 7-year-old male presented with painless bilateral inguinal swelling that increased on straining and resolved on lying down. Examination confirmed a soft, smooth, reducible swelling with positive cough impulse. Routine blood and serological investigations were normal. Diagnostic laparoscopy confirmed bilateral patent internal rings. The patient underwent laparoscopic PIRS under spinal anaesthesia. The procedure was uneventful, with successful closure of both internal rings using extracorporeal knotting.
Results: Post-operative recovery was smooth with no complications. The patient was discharged on the next day with advice for supportive care and follow-up. No recurrence or post-operative morbidity was noted at review.
Conclusion: The PIRS technique is a safe, minimally invasive option for the management of pediatric bilateral indirect inguinal hernia, providing excellent surgical and cosmetic outcomes with minimal operative time and hospital stay.

Keywords: Pediatric hernia, indirect inguinal hernia, PIRS technique, laparoscopic hernia repair, bilateral hernia

Introduction
Inguinal hernia is one of the most common surgical conditions encountered in the pediatric population, with an estimated incidence of 1-5% in full-term infants and up to 30% in preterm infants. It primarily results from a failure of the processus vaginalis to obliterate, leading to an indirect hernia. The condition is more common in boys and predominantly unilateral; however, bilateral involvement is seen in about 10% of cases, which often necessitates meticulous evaluation and surgical planning [1].
Early diagnosis and timely surgical intervention are crucial to prevent complications such as incarceration and strangulation. Traditionally, open herniotomy has been the standard surgical approach for pediatric inguinal hernia repair, with high success rates. However, open repair is associated with certain limitations such as larger incisions, higher risk of contralateral recurrence, and longer recovery time [2].
With advancements in minimally invasive pediatric surgery, laparoscopic techniques have gained popularity due to their ability to inspect both internal rings, detect contralateral patent processus vaginalis, and perform repair through small incisions with better cosmetic results. Among these, the Percutaneous Internal Ring Suturing (PIRS) method, first described by Patkowski in 2006, has emerged as a simple, safe, and effective alternative to conventional open repair [3].
The PIRS technique involves the placement of a suture around the internal ring under laparoscopic vision using a percutaneous approach, without the need for extensive intracorporeal dissection or knotting. This minimally invasive procedure reduces operative time, post-operative pain, and recurrence rates, and is increasingly accepted in many pediatric surgical centers [4].

In this case report, we present a 7-year-old male child with bilateral indirect inguinal hernia managed successfully with the PIRS technique. The report emphasizes the clinical features, operative procedure, and outcome, supporting the growing evidence that PIRS is an excellent option for bilateral pediatric inguinal hernia repair [5].

Case Report

A 7-year-old male child presented to Raj Hospital with complaints of painless swelling in the bilateral inguinal region, more prominent on straining and disappearing on lying down. On clinical examination, the swelling was soft, smooth, reducible, and showed a positive cough impulse. There was no history of pain, trauma, previous surgery, or any significant medical or family history. All routine investigations, including CBC, CRP, BT, CT, PT, TSH, RBS, HIV, VDRL, and HBsAg, were within normal limits. Diagnostic laparoscopy confirmed bilateral patent internal rings indicative of indirect inguinal hernia. Under spinal anesthesia, a percutaneous internal ring suturing (PIRS) procedure was performed, during which both internal rings were closed using a 2-0 Prolene suture and extracorporeal knotting via an umbilical port with a 4 mm telescope. The intraoperative and post-operative periods were uneventful, and the patient was discharged the next day with advice to avoid straining and follow-up after five days. No recurrence or complications were observed during the follow-up.

Table 1: Vital Examination

Parameter	Before Surgery (1/6/25)	After Surgery (2/6/25)
Pulse Rate	80/min	78/min
Temperature	98.6°F	98.4°F
Respiratory Rate	20/min	18/min
Blood Pressure	Normal	Normal
Pallor	Absent	Absent
Icterus	Absent	Absent
Cyanosis	Absent	Absent
Oedema	Absent	Absent
Deformity	Nil	Nil
Dehydration	Nil	Nil

Table 2: Systemic Examination

System	Before Surgery (1/6/25)	After Surgery (2/6/25)
Cardiovascular System (CVS)	S1 S2 normal, no murmurs	S1 S2 normal, no murmurs
Central Nervous System (CNS)	No abnormality detected	No abnormality detected
Respiratory System (RS)	Clear breath sounds, no added sounds	Clear breath sounds, no added sounds
Per Abdomen	Bilateral inguinal swelling present, soft, reducible, positive cough impulse	No swelling, no tenderness, surgical site clean & dry, no signs of recurrence

Table 3: Bilateral indirect inguinal hernia examination

Parameter	Before Surgery (1/6/25)	After Surgery (2/6/25)
Site	Bilateral inguinal regions	No visible swelling
Nature of Swelling	Soft, smooth, reducible	No swelling
Cough Impulse	Positive	Negative
Reducibility	Disappears on lying down	Not applicable
Pain	Absent	Absent
Tenderness	Absent	Absent
Signs of Incarceration/Strangulation	Absent	Absent

Inspection

The child was first positioned standing and then lying down. On inspection in the standing position, a visible bulge was noted in both inguinal regions. The swelling was more evident when the child coughed or strained, and it reduced spontaneously on lying down. The swelling appeared soft and smooth, with well-defined margins and normal overlying skin. There was no redness, ulceration, or any visible signs of inflammation.

Palpation

Gentle palpation of the inguinal region confirmed the presence of soft, non-tender swellings on both sides. The swellings were compressible and reducible with slight manual pressure. A distinct cough impulse was elicited on both sides, confirming the diagnosis of indirect hernia. There was no evidence of tenderness, local rise of temperature, or any signs of irreducibility, incarceration, or strangulation.

Examination of Spermatic Cord and Testes:

Palpation of the spermatic cord structures revealed no thickening or abnormal nodules. The testes were palpable bilaterally in the scrotum, normal in size and position, mobile, non-tender, and without signs of hydrocele or any other associated anomaly.

Differential Movements

The swelling was noted to increase with straining and decrease or disappear when the child was calm or supine, a classic sign of a reducible indirect inguinal hernia. The ring occlusion test was not required intraoperatively as diagnostic laparoscopy was planned.

Intraoperative Confirmation

During laparoscopy under spinal anaesthesia on 1/6/25, the patency of both internal inguinal rings was confirmed — measuring approximately 16 mm on the left side and 11 mm on the right side. No other intra-abdominal anomalies were noted.

Postoperative Examination: On follow-up examination after surgery (2/6/25), the operative sites were inspected and found to be clean and dry with no signs of discharge, redness, or infection. There was no residual swelling in either inguinal region. No cough impulse was present. The spermatic cord structures were palpated and found normal. Both testes were in normal position, non-tender, and freely mobile.

Final Impression

The step-wise examination confirmed a diagnosis of *bilateral indirect inguinal hernia* before surgery, with complete resolution postoperatively following PIRS technique, with no evidence of recurrence or complications.

Table 4: Procedure and Methodology (SOP)

Intraoperative Findings	Details (1/6/25)
Diagnostic Laparoscopy	Bilateral internal rings patent
Size	Left ~16 mm, Right ~11 mm (As per UGC report)
Procedure	Percutaneous Internal Ring Suturing (PIRS)
Closure	Complete closure using 2-0 Prolene, extracorporeal knot
Ports Used	Umbilical port, 4 mm telescope
Complications	None
Sponge/Drain	Nil
Postoperative Recovery	Uneventful, stable vitals, no complications

Preoperative Phase

- Detailed history, clinical exam, vital signs and systemic examination done.
- Routine investigations: CBC, CRP, BT, CT, PT, TSH, RBS, HIV, VDRL, HBsAg — normal.
- Informed consent from parents/guardian.

Anaesthesia & Positioning

- Spinal anaesthesia administered.
- Supine position with slight Trendelenburg tilt for better visualization.

Pneumoperitoneum & Port Placement

- Small supraumbilical incision, 4 mm telescope introduced via umbilical port.
- Pneumoperitoneum established under controlled pressure.

Diagnostic Laparoscopy

- Visualization of both internal inguinal rings confirmed patency.

PIRS Procedure

- 18-G cannula inserted percutaneously adjacent to internal ring under laparoscopic vision.
- 2-0 Prolene suture passed around the internal ring, ensuring no injury to vas deferens or spermatic vessels.
- Suture ends exteriorized and extracorporeal knot tied securely.
- Ring closure verified laparoscopically.

Closure

- Pneumoperitoneum released, telescope removed, port site closed.
- Sponge count and drain check done — nil noted.

Postoperative Phase

- Monitored in recovery room.
- Vitals stable, patient shifted to ward.
- Antibiotics, analgesics, antiulcer medication given as per plan.
- Discharged on 2/6/25 with follow-up instructions.

Table 5: Treatment Plan Table

Parameter	Preoperative (1/6/25)	Intraoperative (1/6/25)	Postoperative (1/6/25 - 2/6/25)
Vital Signs	Pulse: 80/min Temp: 98.6°F RR: 20/min BP: Normal	Stable throughout procedure Monitored continuously	Pulse: 78/min Temp: 98.4°F RR: 18/min BP: Normal
Systemic Examination	CVS: S1 S2 normal, no murmurs CNS: NAD RS: Clear, no added sounds Abdomen: Bilateral inguinal swelling, soft, reducible	Diagnostic laparoscopy done Bilateral patent internal rings confirmed Internal ring sizes: Lt. 16 mm, Rt. 11 mm	CVS: Stable CNS: Conscious, oriented RS: Clear, no distress Local site: Clean, dry, no swelling
Procedure	Patient fitness confirmed Pre-op antibiotic given	PIRS performed under spinal anaesthesia 2-0 Prolene used, extracorporeal knotting done No drain used	Observation in ward Wound care advised Discharged next day with follow-up
Drugs Given	Inj. Amoxyclav 7.5 ml IV BD Inj. Ranitidine 1.2 ml IV BD	—	• Inj. Amoxyclav 7.5 ml IV BD Inj. Voveran 0.7 ml IV TDS Inj. Ranitidine 1.2 ml IV BD Discharge Prescription • Sup. Amoxyclav DS 6.5 ml BD × 3 days Sup. • Ibugesic 6.5 ml TDS × 3 days Sup. • Rantac 5 ml BD × 3 days

Table 6: Follow-Up Plan

Date	Day	Clinical Assessment	Examination/Observation	Advice/Instructions
2/6/25	Postoperative Day 1	Immediate post-op follow-up before discharge	• Vitals stable (Pulse 78/min, Temp 98.4°F, RR 18/min, BP normal) • Operative wound clean & dry • No swelling or discharge • Testes normal, no tenderness • No signs of recurrence	• Discharged with drug chart • Rest advised for 3-5 days • Avoid straining, lifting heavy objects • Maintain wound hygiene
5/6/25	3 Days Post-Discharge	First OPD follow-up	• General physical examination • Inspect incision site for healing, signs of infection or seroma • Palpate groin for any residual swelling • Check testes & spermatic cord	• Continue wound care • If healing proper, discontinue antibiotics • Encourage normal daily activities except strenuous play • Educate parents on signs of recurrence
10/6/25	1 Week Post-Discharge	Second OPD follow-up	• Confirm complete wound healing • Confirm no local tenderness • Re-examine for cough impulse or swelling • Check general health & nutrition	• Normal diet resumed • Allowed light play activities • Advise parents about when to seek urgent care (pain, bulge, discharge)
30/6/25	4 Weeks Post-Op	Final planned review	• Full systemic exam • Check for late recurrence • Inspect scar site for keloid or stitch granuloma • Confirm testicular position & growth	• Declare fit for routine school/play • No restrictions needed • Parents advised to report any future signs of hernia promptly

Table 7: Discharge Report

Parameter	Details
Patient Name	XYZ
Age/Sex	7 Years / Male
Hospital No. (CR No.)	4346
Date of Admission	1/6/25
Date of Surgery	1/6/25
Date of Discharge	2/6/25
Provisional Diagnosis	Bilateral Indirect Inguinal Hernia
Final Diagnosis	Bilateral Indirect Inguinal Hernia
Brief History	c/o swelling in bilateral inguinal region, increasing on straining, reducible on lying down, soft and painless.
Clinical Findings	Bilateral soft, reducible swelling with positive cough impulse; no tenderness; no signs of strangulation.
Investigations Done	CBC, CRP, BT, CT, PT, TSH, RBS, HIV, VDRL, HBsAg — all normal.
Treatment Given	Laparoscopic Percutaneous Internal Ring Suturing (PIRS) under spinal anaesthesia.
Intraoperative Findings	Bilateral internal ring patent — left side ~16 mm, right side ~11 mm; no other anomalies.
Operation Details	PIRS performed with 2-0 Prolene, extracorporeal knotting; no drain required; sponge count correct.
Anaesthesia	Spinal Anaesthesia (S.A.)
Surgeon	Dr. Manish Sharma
Anaesthesiologist	Dr. Arvind
Postoperative Vitals	Pulse 78/min, Temp 98.4°F, RR 18/min, BP Normal
Postoperative Condition	Stable, wound clean & dry, no swelling, no discharge, testes normal.
Drugs on Discharge	Sup. Amoxyclav DS 6.5 ml BD × 3 days, Sup. Ibugesic 6.5 ml TDS × 3 daysSup. Rantac 5 ml BD × 3 days
Diet Advice	Normal diet; light, easily digestible food
Activity Advice	Rest at home for few days; avoid straining, jumping, lifting heavy objects
Follow-Up Plan	First OPD review on 5/6/25; further follow-ups as advised

Discussion

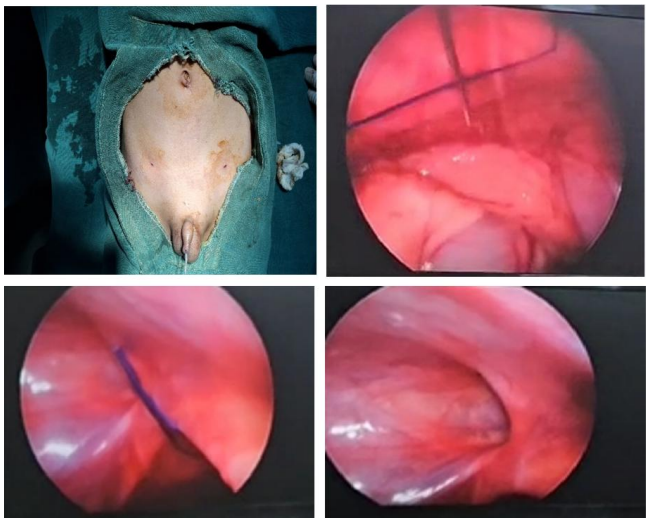
Inguinal hernia is a common pediatric surgical condition, with indirect hernias accounting for the majority of cases due to the persistence of a patent processus vaginalis. Although more common unilaterally, bilateral involvement is not rare and demands careful clinical evaluation to prevent missed contralateral defects. Delayed or untreated cases can lead to complications such as incarceration and strangulation, which may result in serious consequences like bowel obstruction and testicular atrophy [6].

Traditionally, pediatric inguinal hernias have been managed using open herniotomy, which has excellent long-term success rates. However, open repair carries some limitations, such as larger incisions, longer recovery time, risk of damage to cord structures, and the potential for missing a contralateral patent processus vaginalis. With advancements in minimally invasive pediatric surgery, laparoscopic techniques now allow simultaneous inspection and repair of bilateral defects through small ports, improving both functional and cosmetic outcomes [7].

The Percutaneous Internal Ring Suturing (PIRS) technique, described by Patkowski, is one of the simplest and most effective laparoscopic procedures for pediatric inguinal hernia repair. It eliminates the need for extensive

intracorporeal suturing and dissection, reducing operative time and surgical trauma. In this case, PIRS was chosen to manage a bilateral indirect inguinal hernia in a 7-year-old boy. The procedure was completed safely with no intraoperative or postoperative complications, and the patient recovered well, with no recurrence noted at follow-up [8].

This case supports the increasing evidence that PIRS is a reliable alternative to open herniotomy for indirect inguinal hernia repair in children. The advantages include a minimal incision, quick recovery, excellent cosmetic results, and the ability to diagnose and treat bilateral hernias in a single sitting. Wider adoption of this technique may improve surgical outcomes in pediatric hernia management and reduce the incidence of overlooked contralateral hernias [9].



Conclusion

In this case, the successful management of a bilateral indirect inguinal hernia in a 7-year-old child using the Percutaneous Internal Ring Suturing (PIRS) technique demonstrates that minimally invasive laparoscopic repair is a safe, effective, and cosmetically superior alternative to traditional open herniotomy. The procedure allowed simultaneous inspection and repair of both internal rings through a single umbilical port with minimal trauma, no complications, and excellent post-operative recovery. This case highlights that with careful patient selection and proper technique, PIRS offers significant benefits in pediatric hernia surgery and should be considered as a reliable option for routine practice.

Conflict of interest: Nil

Source of support: None

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