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Ms. Ref. No.: IJSCASEREPORTS-D-22-00908

Title: Lumbar Disc Herniation In Pediatric: A Case Report

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Ms. Ref. No.: IJSCASEREPORTS-D-22-00908

Title: Lumbar Disc Herniation In Pediatric: A Case Report

International Journal of Surgery Case Reports

Dear Dr. Faris,

Reviewers have now commented on your paper. You will see that they are advising that you revise your manuscript. If you are prepared to undertake the work required, we would be pleased to reconsider our decision.

For your guidance, reviewers' comments are appended below.

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Reviewers' comments:

Reviewer #1: Background: '...surgical surgery may be considered.' It is not an appropriate term please correct the sentence.

Case presentation: 'sciatica' There are term errors and grammatical errors throughout the article. It needs to be corrected.

'Conservative therapy' needs to be 'Conservative treatment'

Conclusion: 'Lumbar disc herniation in children is a relatively unusual condition.', 'On the other hand, lumbar disc herniation (LDH) rarely occurs in pediatric population' (Introduction), It is known to be rare. This sentence has been written many times in the highlight, introduction, abstract, discussion (Lumbar disc herniation is a very rare disorder in pediatrics) and conclusion (Lumbar disc herniation in the pediatric age group is a very rare condition). Instead, what is the contribution of the study to the literature, it should be written.

'BMI' Abbreviations used in the article should be explained before.

Case presentation: clinic in academic general hospital The name of the department, hospital, the province, the country and the time of application should be written.

'nonsteroidal anti-inflammatory drugs (the name of the drugs, dosage, firm, city, country should be written) and a history of piriformis injection (time,dosage, units must be written)'

'The surgery was done by a consultant spine surgeon in our institution.' which surgical approach and method was used.

Discussion 'This prolonged duration is due to both delay in diagnosis and the time needed to attempt at conservative therapy,treatment which should be the first line of therapytreatment (reference). This initial misdiagnosis reflects the fact that LDH is uncommon in children and radiculopathy is often not considered in the initial differential diagnosis of leg pain (reference). Patients with neurological deficit or intractable pain should go for surgery of the herniated disc..'Missing references must be written overall the article. Please use correct medical terms.

Conclusion: Which surgical approach and treatment was effective? Have you been treated with medication? are there any side effects? What is the contribution to the literature?

Ethical approval: It must be the ethics committee approval number and date because patient data was used. The article cannot be accepted without the ethics committee approval number and date.

Figure 1 needs scale bars, arrowheads, and abbreviations

Figure 2 must be removed.

Reviewer #2: \* The abstract is well written.

- \* All the parts whether introduction or case presentation are organized carefully. However the authors have not indicated the novelty of this case.
- \* There are no pieces of information about the details of surgical approaches and techniques.
- \* What about the follow-up of the patient?

Reviewer #3: Dear authors

Thank you for this interesting report

Padiatric LDH are rare but non exceptional conditions. The interest of discussing this condition is to emphasize its physiopathology in order to understand which these children suffer from LDH at such a low age. So I would recommend a wider review and discussion of the specific mechanisms of genesis of LDH in children. It would also be interesting to discuss mid and long term prognosis regarding the risk of recurrence and repercussion on spinal static.

Editor in Chief: CHANGE the title----you cannot state "in a paediatric" Perhaps "young child " or the age of the patient 'a - year old boy"

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International Journal of Surgery Case Reports

Title: Lumbar Disc Herniation in a 15-year-old Girl: A Case Report

Authors: Fachriy Balafif; Muhammad Faris; Eko Agus Subagio; Abdul Hafid Bajamal

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Title: Lumbar Disc Herniation in a 15-year-old Girl: A Case Report

International Journal of Surgery Case Reports

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Yours sincerely,

The Editors
International Journal of Surgery Case Reports

Comments from the editors and reviewers:

Muhammad Faris, MD, PhD, FINSS

(NeuroSpine Surgeon)

Secretary of Neuro-Spine committee, Indonesian Society of Neurosurgical Surgeons

Secretary General of Fellowship Indonesian Neuro-Spine Society

Secretary of Health Research Ethics Committee, Medical Faculty Airlangga University

Head of Spine Division, Medical Faculty Airlangga University, Dr. Soetomo General Academic Hospital

[Kutipan teks disembunyikan]

# Lumbar <del>Ddisc</del> Hherniation in a 15-year-old Ggirl: A <mark>€c</mark>ase <mark>Rr</mark>eport<mark></mark>

(i) The corrections made in this section will be reviewed and approved by a journal production editor.

Fachriy Balafif<sup>a</sup>, Muhammad Faris<sup>a,b,\*,\*\*</sup>, mfarisns@fk.unair.ac.id, Eko Agus Subagio<sup>a</sup>, Abdul Hafid Bajamal<sup>a</sup>

<sup>a</sup>Department of Neurosurgery, Universitas Airlangga - Dr. Soetomo General Academic Hospital, Surabaya, East Java, Indonesia

<sup>b</sup>Department of Neurosurgery, Adi Husada Undaan Hospital, Surabaya, Ea[Instruction: 1. Additional Author:Name : Annie Kusumadewi Institution: Department of Pediatrics, Adi Husada Undaan Hospital, Surabaya, East Java, Indonesia 2. Figure 2 is removed. (See Fig. 2 on Case presentation paragraph also removed)]st Java, Indonesia

\*Corresponding author at: Department of Neurosurgery, Airlangga University - Dr. Soetomo General Academic Hospital, Surabaya, East Java, Indonesia.

\*\*Corresponding author at: Department of Neurosurgery, Adi Husada Undaan Hospital, Surabaya, East Java, Indonesia.

### Abstract

**Introduction:** Lumbar disc herniation (LDH) is uncommon in the pediatric population. The lumbar spine biodynamics and architecture change with age, with adults being more susceptible to LDH than children. When conservative treatment fails for pediatric LDH, surgery may be considered. We described an unusual instance of pediatric lumbar disc herniation that was successfully treated with microdiscectomy.

Case presentation: A 15-year-old patient presented with back discomfort and pain in her left leg that had been deteriorating for over 4 years. Conservative treatment with nonsteroidal anti-inflammatory medications and piriformis injection is ineffective. An MRI of her lumbosacral spine revealed that the left L4 root was compressed by a disc herniation at the L4/L5 level. A microdiscectomy was performed on the patient. Within 48 hoursh of surgery, the patient was released home with significant alleviation in sciatic discomfort.

Discussion: In the pathogenesis of LDH, trauma and a sedentary lifestyle are important factors. Back pain and radiating pain are typical LDH symptoms. If conservative treatment does not result in a positive outcome, the microdiscectomy procedure is the surgical approach of choice. Long-term outcomes have demonstrated the efficacy and safety of this procedure.

Conclusion: Every child who presents with back pain or radiculopathy should undergo a thorough evaluation for LDH especially if they have a high body mass index (BMI) or a history of trauma. Careful patient selection and preoperative evaluation result in extremely excellent surgery outcomes in pediatric LDH.

## Keywords:

#### **Abbreviations**

MRI Magnetic resonance imaging LDH Lumbar Disc Herniation

# 1-1 Introduction

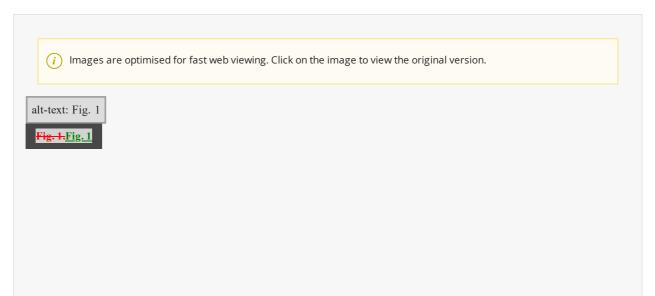
Herniation of lumbar intervertebral discs is a common lumbar spine disorder that is frequently encountered in the adult population. On the other hand, lumbar disc herniation (LDH) rarely occurs in the pediatric population. The changes in lumbar spine biodynamics and anatomy are age-related, where adults are at greater risk for LDH than pediatrics [1]. It is unclear whether findings in adult LDH can be compared to those in pediatric patients, but they may be related to one another and have different clinical and natural histories [2]. Additionally, pediatric LDH is still poorly understood [3].

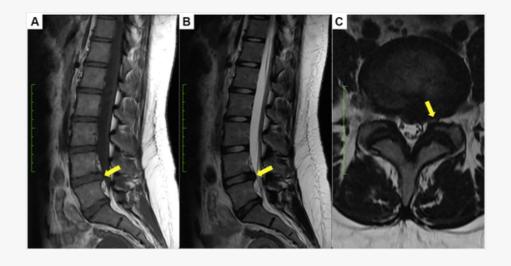
Due to the low prevalence of pediatric LDH cases, pediatric patients with LDH are frequently misdiagnosed [2]. The incidence of pediatric LDH accounts for 0.4-15.4 % of surgically treated patients with LDH [4]. In pediatric LDH without neurological deficit, a trial of conservative treatment is typically advised as the appropriate initial management before surgery. Surgical management may be indicated for pediatric LDH that fails with conservative treatment [2,3]. We reported an uncommon case of lumbar disc herniation in pediatrics, which was successfully treated with microdiscectomy. This case report has been reported in line with the SCARE Criteria [5].

# 2.2 Case presentation

A 15-year-old female patient was brought by her parents to the neurosurgery outpatient clinic in Adi Husada Undaan Hospital, Surabaya, East Java, Indonesia on January 2022 due to back discomfort and pain in her left leg for over 4 years worsening over the last 6 months. The patient frequently carries heavy loads and experiences repetitive trauma. There was no improvement in her symptoms despite treatment with nonsteroidal anti-inflammatory drugs (NSAIDs). The patient consumed Ibuprofen 400 mg three times a day (Farsifen®, Ifars Pharmaceutical Laboratories, Central Java, Indonesia). She also had piriformis injection of Triamcinolone (10 mg/mL) 2 mL (Trilac\*. Novell Pharmaceutical Labs, Jakarta, Indonesia) in the past. A physical examination was then performed, and it revealed that the left leg had tested positive for straight-leg raising. There was no evidence of hypoesthesia, bladder dysfunction, or bowel dysfunction, and the motor function was unaffected. She had a body mass index of 27.3 kg/m<sup>2</sup> (overweight). Magnetic resonance imaging (MRI) of her lumbosacral spine revealed a disc herniation at the L4/L5 level, compressing the left L4 root, as shown in (Fig. 1). The patient was diagnosed with LDH at the L4/L5 level and prepared for surgery. Full laboratory investigations showed normal results. The surgery was done by a consultant spine surgeon in our institution. The open microdiscectomy method was then chosen because it is minimally invasive, has good visualization, and carries a low

Q4 risk of complications. (See Fig. 2.)





 $A\ Sagittal\ T1, B\ sagittal\ T2, and\ C\ axial\ T2\ show\ the\ disc\ hermiation\ compressing\ the\ left\ L4\ root.$ 

*i* Images are optimised for fast web viewing. Click on the image to view the original version.

alt-text: Fig. 2

Fig. 2

Q1



1 remove this picture

The patient underwent a microdiscectomy. Prolapsed part of the L4/L5 intervertebral disc was gently removed from the intervertebral foramen and spinal canal. Some free parts of the degenerated disc were removed through the annulus fibrosus. There were no complications during surgery. After surgery, the patient made significant progress. Within 48 hoursh after surgery, the patient was sent home with a marked reduction in sciatic pain. Following discharge, the patient returned for follow-up visits at regular intervals (every 1 month) to the neurosurgery unit. At each patient visit, a clinical and neurological examination was performed. The patient showed good clinical improvement as well as remarkable motor function. No signs of neurological deficit or sciatic pain in her left leg after a three-month follow-up period.

## 3.3 Discussion

Lumbar disc herniation is a very rare disorder in pediatrics, and it accounts for about 0.5–6.8 % of entire patients hospitalized for LDH, with a higher incidence in Japanese children [6–8]. This study itself is the first pediatric LDH case report in Indonesia. Theoretically, there are typically no degenerative changes in pediatric LDH. Trauma, particularly from sports or self-reported incidents like heavy lifting, is anticipated to be a trigger for LDH in children and adolescents [3]. The incidence of trauma in pediatric patients with herniated discs ranges from 36 to 100 % [9]. Genetic factors and vertebral abnormalities such as scoliosis are also associated with LDH in children and adolescents [10]. Compared to age and gender, this patient's body mass index of 27.3 indicates that she was overweight, which is a risk factor for the development of lumbar disc disease [11].

One of the factors that contribute to LDH in this patient is axial overloading, which is typically brought on by sedentary and seated lifestyle [12]. Recent research on caprine intervertebral discs revealed that, when compared to physiological loading and dynamic overloading, static overloading particularly increased the risk of posterior herniation [12,13]. Additionally, studies have demonstrated that being overweight can hasten the metabolism, add to the load on the lumbar disc, and accelerate degenerative processes [14].

Cahill et al reported that 95 % of LDH in children complained of pain radiating down the leg and 85 % complained of back pain [15]. Bladder and bowel dysfunction is rare complaints. The most common operated segment in pediatric LDH is L4–5, accounting for 45 % of surgeries, followed by L5–S1 (36%), and L3–4 (7 %). The time from symptom onset to surgical treatment in pediatric LDH is often delayed. This extended period of time is the result of both the delayed diagnosis and the time required to try conservative treatment, which should be the initial course of action [3]. This initial misdiagnosis is a reflection of the low prevalence of LDH in children and the frequent exclusion of radiculopathy from the initial differential diagnosis of leg pain [15]. Patients should undergo herniated disc surgery if they have neurological deficits or unremitting pain [16]. Spinal fusion is not recommended for children, thus a minimally invasive approach should be chosen to avoid complications of spinal growth in children [3,15]. Importantly, this case report indicates that microdiscectomy is an effective and safe procedure for pediatric patients. The prolapsed part of the L4/L5 intervertebral disc was gently removed from the intervertebral foramen and spinal canal. Some free parts of the degenerated disc were removed through the annulus fibrosus. The patient was discharged home within 48 hoursh after surgery.

In pediatric patients with symptomatic lumbar disc disease for whom conservative management has failed, microdiscectomy is a safe and effective treatment for long-term pain relief and return to daily activities [16]. According to studies, the microdiscectomy procedure has a good outlook, with an overall success rate of 79–84 % over the following 20 years [17]. To further improve the quality of life, a healthy lifestyle is required, including regular exercise, a balanced diet, and regular follow-up [14]. In this instance, the patient was instructed to follow up every month for three months, and there was a clinically significant improvement in our patient.

The patient feels that each choice made by the clinician will improve their quality of life. The doctor has given the patient's necessary treatment. The patient and family continue to have high expectations for our team because they are appreciative of the treatment's initial success.

# 4.4 Conclusion

This is the first pediatric LDH case report in Indonesia. Lumbar disc herniation is often not considered in the pediatric age group. Diagnosis is often delayed due to lack of experience in dealing with this condition in children. Any pediatric

patient who presents with back pain or radiculopathy must be thoroughly investigated to avoid misdiagnosis, especially in those with a high body mass index or history of trauma. The surgical technique with open microdiscectomy has been shown to provide good clinical effectiveness for pediatric LDH cases. During the time of follow-up, there were no issues with the surgery itself or its aftermath. LDH should be taken into account in all age groups so that a more accurate diagnosis and course of treatment can be followed to enhance the patient's quality of life.

## Provenance and peer review

Not commissioned, externally peer-reviewed.

## **Funding**

None.

# Ethical Aapproval

All ethical principles were considered in conducting this case report. All patient information kept confidential.

## Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

## Author contribution

Muhammad Faris - data collection, manuscript writing, critically revising article, reviewed final version of article

Fachriy Balafif - study concept, patient contribution, revising article, reviewed final version of article, study oversight, creation of figures

Eko Agus Subagio - data collection, critically revising article, reviewed final version of article

Abdul Hafid Bajamal - study concept, patient contribution, revising article, reviewed final version of article

# Registration of research studies

Not applicable.

## Guarantor

Dr. Muhammad Faris.

# **Declaration of competing interest**

The authors declare that they have no conflict of interest.

## References



(i) The corrections made in this section will be reviewed and approved by a journal production editor. The newly added/removed references and its citations will be reordered and rearranged by the production team.

- [1] S. Ozgen, D. Konya, O. Toktas, A. Dağçınar, M. Ozek, Lumbar disc herniation in adolescence, Pediatr. Neurosurg. 43 (2007) 77–81, doi:10.1159/000098377.
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#### **Footnotes**

#### **Article Footnotes**

[☆] Submission statement: This manuscript is original and has not been submitted elsewhere in part or in whole.

# **Highlights**

Q3

- This is the first pediatric LDH case report published in Indonesia
- Lumbar disc herniation (LDH) rarely occurs in the pediatric population.
- Due to the rarity of LDH in pediatrics, the diagnosis is frequently made incorrectly.
- Surgical management may be indicated for pediatric LDH that fails with conservative treatment.
- Microdiscectomy for pediatric LDH at the L4/L5 level resulted in immediate relief of pain and there was no neurological deficit during follow-up.

## **Queries and Answers**

Q1

Query: Please provide a caption for Fig. 2.

Answer: Done

Q2

**Query:** Please review the **given names and surnames** to make sure that we have identified them correctly and that they are presented in the desired order. Carefully verify the spelling of all authors' names as well. If changes are needed, please provide the edits in the author section.

Answer: Yes

Q3

**Query: Highlights** should only consist of 125 characters per bullet point, including spaces. The highlights provided are too long; please edit them to meet the requirement.

Answer: Done

Query: Fig. 2 were not cited in the text. Please check that the citations suggested are in the appropriate place, and correct if necessary.

Answer: Done