

World Journal of *Clinical Cases*

World J Clin Cases 2021 February 26; 9(6): 1247-1498



Contents

Thrice Monthly Volume 9 Number 6 February 26, 2021

EDITORIAL

- 1247 Interactive platform for peer review: A proposal to improve the current peer review system
Emile SH

MINIREVIEWS

- 1251 Animal models of cathartic colon
Meng YY, Li QD, Feng Y, Liu J, Wang EK, Zhong L, Sun QL, Yuan JY

ORIGINAL ARTICLE

Case Control Study

- 1259 New indicators in evaluation of hemolysis, elevated liver enzymes, and low platelet syndrome: A case-control study
Kang SY, Wang Y, Zhou LP, Zhang H

Retrospective Study

- 1271 Analysis of hospitalization costs related to fall injuries in elderly patients
Su FY, Fu ML, Zhao QH, Huang HH, Luo D, Xiao MZ
- 1284 Effect of alprostadil in the treatment of intensive care unit patients with acute renal injury
Jia Y, Liu LL, Su JL, Meng XH, Wang WX, Tian C

Clinical Trials Study

- 1293 Etomidate *vs* propofol in coronary heart disease patients undergoing major noncardiac surgery: A randomized clinical trial
Dai ZL, Cai XT, Gao WL, Lin M, Lin J, Jiang YX, Jiang X

Observational Study

- 1304 Healthy individuals *vs* patients with bipolar or unipolar depression in gray matter volume
Zhang YN, Li H, Shen ZW, Xu C, Huang YJ, Wu RH
- 1318 Impact of metabolism-related mutations on the heart rate of gastric cancer patients after peritoneal lavage
Yuan Y, Yao S, Luo GH, Zhang XY

CASE REPORT

- 1329 Efficacy of afatinib in a patient with rare EGFR (G724S/R776H) mutations and amplification in lung adenocarcinoma: A case report
He SY, Lin QF, Chen J, Yu GP, Zhang JL, Shen D

- 1336** Esophageal superficial adenosquamous carcinoma resected by endoscopic submucosal dissection: A rare case report
Liu GY, Zhang JX, Rong L, Nian WD, Nian BX, Tian Y
- 1343** Do medullary thyroid carcinoma patients with high calcitonin require bilateral neck lymph node clearance? A case report
Gan FJ, Zhou T, Wu S, Xu MX, Sun SH
- 1353** Femoral epithelioid hemangioendothelioma detected with magnetic resonance imaging and positron emission tomography/computed tomography: A case report
Zhao HG, Zhang KW, Hou S, Dai YY, Xu SB
- 1359** Noninvasive tools based on immune biomarkers for the diagnosis of central nervous system graft-vs-host disease: Two case reports and a review of the literature
Lyu HR, He XY, Hao HJ, Lu WY, Jin X, Zhao YJ, Zhao MF
- 1367** Periodontally accelerated osteogenic orthodontics with platelet-rich fibrin in an adult patient with periodontal disease: A case report and review of literature
Xu M, Sun XY, Xu JG
- 1379** Subtalar joint pigmented villonodular synovitis misdiagnosed at the first visit: A case report
Zhao WQ, Zhao B, Li WS, Assan I
- 1386** Wilson disease — the impact of hyperimmunity on disease activity: A case report
Stremmel W, Longerich T, Liere R, Vacata V, van Helden J, Weiskirchen R
- 1394** Unexplained elevation of erythrocyte sedimentation rate in a patient recovering from COVID-19: A case report
Pu SL, Zhang XY, Liu DS, Ye BN, Li JQ
- 1402** Thoracic pyogenic infectious spondylitis presented as pneumothorax: A case report
Cho MK, Lee BJ, Chang JH, Kim YM
- 1408** Unilateral pulmonary hemorrhage caused by negative pressure pulmonary edema: A case report
Park HJ, Park SH, Woo UT, Cho SY, Jeon WJ, Shin WJ
- 1416** Osseous Rosai-Dorfman disease of tibia in children: A case report
Vithran DTA, Wang JZ, Xiang F, Wen J, Xiao S, Tang WZ, Chen Q
- 1424** Abdominopelvic leiomyoma with large ascites: A case report and review of the literature
Wang YW, Fan Q, Qian ZX, Wang JJ, Li YH, Wang YD
- 1433** Unusual presentation of granulomatosis with polyangiitis causing periaortitis and consequent subclavian steal syndrome: A case report
Cho U, Kim SK, Ko JM, Yoo J
- 1439** Postoperative discal pseudocyst and its similarities to discal cyst: A case report
Fu CF, Tian ZS, Yao LY, Yao JH, Jin YZ, Liu Y, Wang YY

- 1446** Treatment of oral lichen planus by surgical excision and acellular dermal matrix grafting: Eleven case reports and review of literature
Fu ZZ, Chen LQ, Xu YX, Yue J, Ding Q, Xiao WL
- 1455** Nonalcoholic fatty liver disease as a risk factor for cytomegalovirus hepatitis in an immunocompetent patient: A case report
Khiatah B, Nasrollah L, Covington S, Carlson D
- 1461** Early reoccurrence of traumatic posterior atlantoaxial dislocation without fracture: A case report
Sun YH, Wang L, Ren JT, Wang SX, Jiao ZD, Fang J
- 1469** Intrahepatic cholangiocarcinoma is more complex than we thought: A case report
Zeng JT, Zhang JF, Wang Y, Qing Z, Luo ZH, Zhang YL, Zhang Y, Luo XZ
- 1475** Congenital hepatic fibrosis in a young boy with congenital hypothyroidism: A case report
Xiao FF, Wang YZ, Dong F, Li XL, Zhang T
- 1483** Polidocanol sclerotherapy for multiple gastrointestinal hemangiomas: A case report
Yao H, Xie YX, Guo JY, Wu HC, Xie R, Shi GQ
- 1490** Gastrointestinal stromal tumor with multisegmental spinal metastases as first presentation: A case report and review of the literature
Kong Y, Ma XW, Zhang QQ, Zhao Y, Feng HL

ABOUT COVER

Editorial Board Member of *World Journal of Clinical Cases*, Dr. Quach is an Associate Professor of Gastroenterology at the University of Medicine and Pharmacy at Hochiminh City, Viet Nam, where he received his MD in 1997 and his PhD in 2011. Dr. Quach has published more than 100 reviews and original papers in local and international journals. He has received several awards, including Outstanding Presentation at the Biannual Scientific Congress of Vietnamese Nationwide Medical Schools, Medal of Creativeness from the Vietnamese Central Youth League, etc. Currently, he serves as a Vice President of the Vietnam Association of Gastroenterology and Secretary General of the Vietnam Federation for Digestive Endoscopy. (L-Editor: Filipodia)

AIMS AND SCOPE

The primary aim of *World Journal of Clinical Cases* (WJCC, *World J Clin Cases*) is to provide scholars and readers from various fields of clinical medicine with a platform to publish high-quality clinical research articles and communicate their research findings online.

WJCC mainly publishes articles reporting research results and findings obtained in the field of clinical medicine and covering a wide range of topics, including case control studies, retrospective cohort studies, retrospective studies, clinical trials studies, observational studies, prospective studies, randomized controlled trials, randomized clinical trials, systematic reviews, meta-analysis, and case reports.

INDEXING/ABSTRACTING

The WJCC is now indexed in Science Citation Index Expanded (also known as SciSearch®), Journal Citation Reports/Science Edition, Scopus, PubMed, and PubMed Central. The 2020 Edition of Journal Citation Reports® cites the 2019 impact factor (IF) for WJCC as 1.013; IF without journal self cites: 0.991; Ranking: 120 among 165 journals in medicine, general and internal; and Quartile category: Q3. The WJCC's CiteScore for 2019 is 0.3 and Scopus CiteScore rank 2019: General Medicine is 394/529.

RESPONSIBLE EDITORS FOR THIS ISSUE

Production Editor: Ji-Hong Lin; Production Department Director: Xiang Li; Editorial Office Director: Jin-Lai Wang.

NAME OF JOURNAL

World Journal of Clinical Cases

ISSN

ISSN 2307-8960 (online)

LAUNCH DATE

April 16, 2013

FREQUENCY

Thrice Monthly

EDITORS-IN-CHIEF

Dennis A Bloomfield, Sandro Vento, Bao-Gan Peng

EDITORIAL BOARD MEMBERS

<https://www.wjgnet.com/2307-8960/editorialboard.htm>

PUBLICATION DATE

February 26, 2021

COPYRIGHT

© 2021 Baishideng Publishing Group Inc

INSTRUCTIONS TO AUTHORS

<https://www.wjgnet.com/bpg/gerinfo/204>

GUIDELINES FOR ETHICS DOCUMENTS

<https://www.wjgnet.com/bpg/GerInfo/287>

GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH

<https://www.wjgnet.com/bpg/gerinfo/240>

PUBLICATION ETHICS

<https://www.wjgnet.com/bpg/GerInfo/288>

PUBLICATION MISCONDUCT

<https://www.wjgnet.com/bpg/gerinfo/208>

ARTICLE PROCESSING CHARGE

<https://www.wjgnet.com/bpg/gerinfo/242>

STEPS FOR SUBMITTING MANUSCRIPTS

<https://www.wjgnet.com/bpg/GerInfo/239>

ONLINE SUBMISSION

<https://www.f6publishing.com>



Postoperative discal pseudocyst and its similarities to discal cyst: A case report

Chang-Feng Fu, Zhi-Sen Tian, Li-Yu Yao, Ji-Hang Yao, Yuan-Zhe Jin, Ying Liu, Yuan-Yi Wang

ORCID number: Chang-Feng Fu 0000-0001-8250-6694; Zhi-Sen Tian 0000-0002-7986-9416; Li-Yu Yao 0000-0001-8422-6194; Ji-Hang Yao 0000-0002-7325-4285; Yuan-Zhe Jin 0000-0001-9068-2778; Ying Liu 0000-0003-3866-1632; Yuan-Yi Wang 0000-0002-6163-5144.

Author contributions: Fu CF and Wang YY performed the percutaneous endoscopic lumbar discectomy surgery and applied the continuous treatment; Tian ZS and Yao LY validated the data and visualization; Yao JH and Jin YZ searched the literature; Wang YY and Tian ZS drafted the manuscript; Wang YY conceptualized the study.

Informed consent statement:

Informed written consent was obtained from the patient for publication of this report and any accompanying images.

Conflict-of-interest statement: The authors declare that they have no conflict of interest to disclose.

CARE Checklist (2016) statement:

The authors have read the CARE Checklist (2016), and the manuscript was prepared and revised according to the CARE Checklist (2016).

Open-Access: This article is an open-access article that was

Chang-Feng Fu, Yuan-Zhe Jin, Ying Liu, Yuan-Yi Wang, Department of Spine Surgery, The First Hospital of Jilin University, Changchun 130021, Jilin Province, China

Zhi-Sen Tian, Department of Spine Surgery, China-Japan Union Hospital of Jilin University, Changchun 130021, Jilin Province, China

Li-Yu Yao, Department of Pediatric Surgery, The First Hospital of Jilin University, Changchun 130021, Jilin Province, China

Ji-Hang Yao, Department of Traumatology, The First Hospital of Jilin University, Changchun 130021, Jilin Province, China

Yuan-Yi Wang, Department of Spine Surgery, Jilin Engineering Research Center for Spine and Spinal Cord Injury, Changchun 130021, Jilin Province, China

Corresponding author: Yuan-Yi Wang, MD, PhD, Associate Professor, Department of Spine Surgery, The First Hospital of Jilin University, No. 1 Xinmin Street, Changchun 130021, Jilin Province, China. wangyuanyi@jlu.edu.cn

Abstract

BACKGROUND

Postoperative discal pseudocyst (PDP) is a rare condition that presents after surgery for lumbar disc herniation. Due to the lack of information, the diagnosis and treatment of PDP remain controversial. Herein, we report a PDP case that occurred following percutaneous endoscopic lumbar discectomy and received conservative treatment. Additionally, we review all the published literature regarding PDP and propose our hypothesis regarding PDP pathology.

CASE SUMMARY

A 23-year-old man presented with a relapse of low back pain and numbness in his left lower extremity after undergoing percutaneous endoscopic lumbar discectomy for lumbar disc herniation. Repeat magnetic resonance imaging demonstrated a cystic lesion at the surgical site with communication with the inner disc. The patient was diagnosed as having PDP. The patient received conservative treatment, which resulted in rapid improvement and spontaneous regression of the lesion, and had a favorable outcome in follow-up.

CONCLUSION

PDP and discal cyst (DC) exhibit similarities in both histological and

selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

Manuscript source: Unsolicited manuscript

Specialty type: Medicine, research and experimental

Country/Territory of origin: China

Peer-review report's scientific quality classification

Grade A (Excellent): 0
Grade B (Very good): 0
Grade C (Good): C
Grade D (Fair): 0
Grade E (Poor): 0

Received: October 15, 2020

Peer-review started: October 15, 2020

First decision: December 21, 2020

Revised: December 23, 2020

Accepted: January 5, 2021

Article in press: January 5, 2021

Published online: February 26, 2021

P-Reviewer: Berra LV

S-Editor: Zhang L

L-Editor: Wang TQ

P-Editor: Li JH



epidemiological characteristics, which indicates the same pathological origin of PDP and DC. The iatrogenic annular injury during discectomy might accelerate the pathological progression of DC. For patients with mild to moderate symptoms, conservative treatment can lead to great improvement, even inducing spontaneous regression. However, surgical cystectomy is necessary in patients with neurological deficits and where conservative treatment is ineffective.

Key Words: Postoperative discal pseudocyst; Discal cyst; Percutaneous endoscopic lumbar discectomy; Cystectomy; Case report

©The Author(s) 2021. Published by Baishideng Publishing Group Inc. All rights reserved.

Core Tip: In the present paper, we present a rare case of postoperative discal pseudocyst (PDP). At presentation, the patient showed relapse symptoms after discectomy for lumbar disc herniation. He underwent conservative treatment, and revealed excellent outcomes. We review and discuss the symptoms, previous operations, and histological findings of PDP. We found that PDP mainly occurs in physically active young Asian males and is composed of dense fibrous connective tissue without epithelial lining and bloody serous fluid as cyst wall and content, respectively, which suggested that PDP and discal cyst have the same pathogenesis.

Citation: Fu CF, Tian ZS, Yao LY, Yao JH, Jin YZ, Liu Y, Wang YY. Postoperative discal pseudocyst and its similarities to discal cyst: A case report. *World J Clin Cases* 2021; 9(6): 1439-1445

URL: <https://www.wjgnet.com/2307-8960/full/v9/i6/1439.htm>

DOI: <https://dx.doi.org/10.12998/wjcc.v9.i6.1439>

INTRODUCTION

Postoperative discal pseudocyst (PDP) is a rare condition that develops after surgery for lumbar disc herniation. Young *et al*^[1] first reported PDP as an independent pathological condition in 2009 and characterized it as a cystic lesion that is attached to the site of surgery at the disc that underwent discectomy^[2]. As a post-surgical condition, PDP occurs after open discectomy, percutaneous endoscopic lumbar discectomy (PELD), and micro-endoscopic discectomy. However, unlike discal cyst (DC), which is another cystic lesion occurring at the intervertebral disc, the pathogenesis of PDP remains unclear^[3-5]. The two principal strategies for the treatment of PDP are conservative treatment and surgical cystectomy. Although both are reportedly effective, the indications for the treatments remain controversial. Here, we report a case with PDP that developed after PELD and underwent conservative treatment. We investigate the characteristics of PDP and DC by comparing the reported histological findings of the two conditions and further discuss the ideal treatment for PDP by reviewing all the published literature pertaining to PDP.

CASE PRESENTATION

Chief complaints

A 23-year-old man presented to the spine surgery clinic with mild low back pain and slight numbness in his left leg.

History of present illness

The patient reported recurrence of low back pain and numbness in the same area after receiving PELD surgery.

History of past illness

The patient was diagnosed with lumbar disc herniation at L4-5 (Figure 1A) and underwent percutaneous endoscopic lumbar discectomy. During the operation of

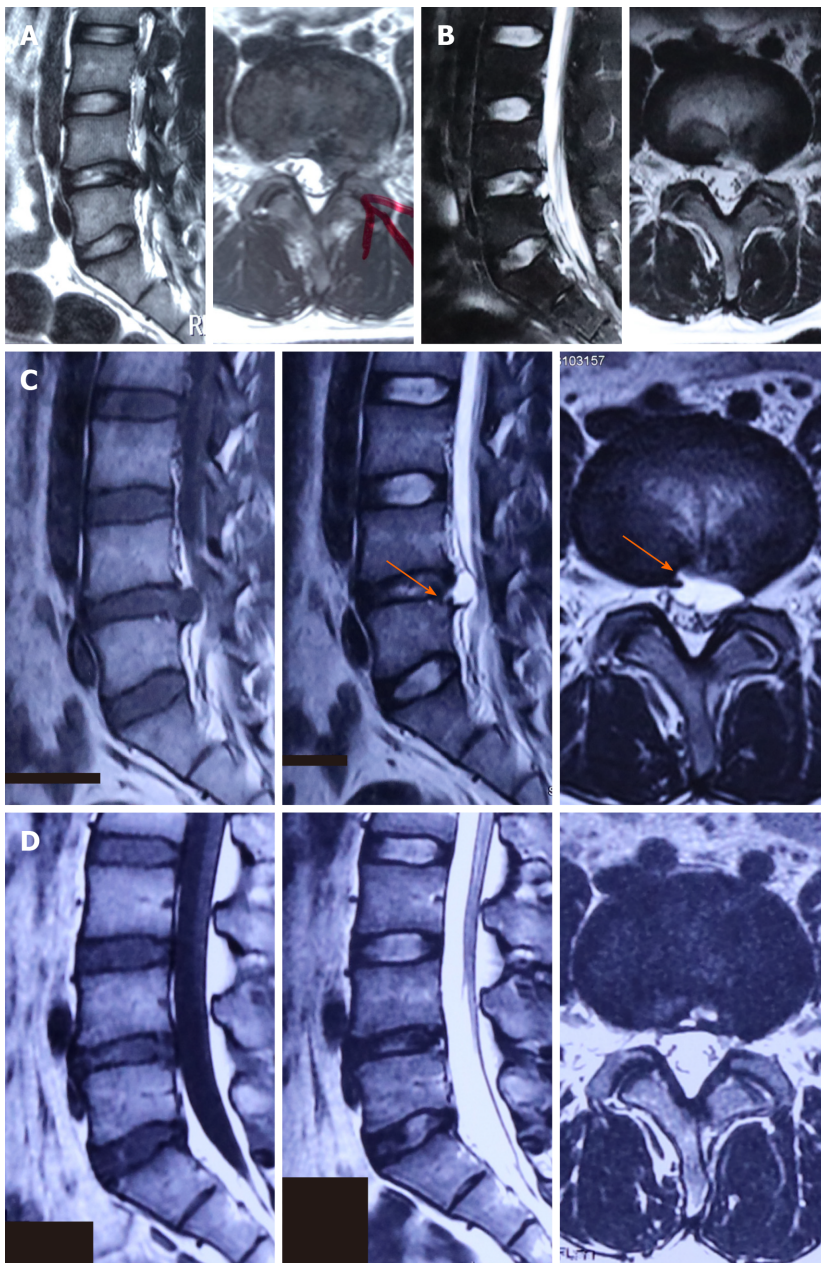


Figure 1 Magnetic resonance imaging of case 1. A: Pre-surgical magnetic resonance imaging (MRI) showing lumbar disc herniation at L4-5; B: Post-surgical MRI confirming complete removal of the herniated disc fragment; C: Re-examination MRI revealed a cystic lesion at the surgical site with a communication stalk between the cyst and inner disc (arrow); D: Follow-up MRI after 6 mo demonstrating complete spontaneous regression of the lesion.

PELD, the nerve root and dural sac were well-preserved and no cerebral fluid leakage occurred after surgery. His symptoms were relieved immediately post-surgery, and postoperative magnetic resonance imaging (MRI; 3 d after the surgery) revealed normal post-surgery changes with complete resection of the migrating disc (Figure 1B). The patient was discharged on the 5th postoperative day without any residual symptoms. However, 40 d after surgery, the patient reported recurrence of low back pain and numbness in the same area as in the pre-surgical period.

Imaging examinations

Repeat MRI demonstrated the development of a cystic lesion at the surgical site (Figure 1C). The lesion presented a hypointensive signal in T1-weighted image and hyperintensity in T2-weighted image, with a clear communication with the nucleus pulposus, which led to a diagnosis of PDP (Figure 1C).

FINAL DIAGNOSIS

The patient was diagnosed with PDP at the segment of L4-5.

TREATMENT

The patient received conservative treatment, including nonsteroidal anti-inflammatory drugs (celecoxib, 200 mg, BID) and bed rest.

OUTCOME AND FOLLOW-UP

After 2 wk, the patient's symptoms were effectively improved. On follow-up examinations, he reported no residual symptoms, and MRI after 6 mo showed spontaneous regression of PDP (Figure 1D).

DISCUSSION

PDP is an extremely rare post-discectomy complication, which was first reported by Young *et al*^[1] in 2009. Subsequently, several reports have described this infrequent condition using different terms, including postoperative annular pseudocyst^[1], post-discectomy pseudocyst^[4], and postoperative discal pseudocyst^[2]. Due to the compression of nearby nerve roots, PDP can be symptomatic, and patients usually present with recurrent-lumbar disc herniation-like symptoms within a short period after surgery, such as low back pain or radiculopathy of the lower extremities. For better understanding of PDP, we review all the reported PDP cases in addition to our case. There are a total of 36 cases (33 men, 3 women) with the development of PDP after discectomy, with an average age of 26.1 years and average onset time of 24.5 ± 10.3 d post-surgery (Table 1). All cases had PDP in the lumbar segments, predominantly at the lower lumbar disc (L4-L5 and L5-S1).

Among the PDP cases, previous operations consisted of micro-endoscopic discectomy (12 cases) and open discectomy (3 cases), and it is worth mentioning that post-PELD PDP cases (21 cases) appeared and rose rapidly along with the popularization of PELD (Table 1)^[1-8]. Almost all PDP cases were reported after less-aggressive discectomy focusing on the herniated disc fragment and ruptured annulus fibrosus, which maintains the physiological function of the majority of the discal complex, and thus fulfills the requirement of containing the fluid supply. Moreover, the focal inflammatory response caused by the minimally invasive surgery with little disturbance of the surrounding tissue may contribute to pseudo-capsule formation. In the reported PDP cases, the average onset time of PDP was 24.5 ± 10.3 d, which conforms to the plasticity period of inflammation and post-surgical scar formation. Young *et al*^[1] hypothesized that PDP is caused by fluid accumulation within a potential space that communicates with the inner annulus fibrosus and is layered by a fibrous pseudo-membrane that is reactively formed due to the inflammatory response after surgery. Based on this theory, Chung *et al*^[2] suggested that post-surgical movement of the unfixed segment may pump fluid from the mildly degenerated disc complex to the inflammatory response area *via* a defective annulus fibrosis, leading to the formation of a cystic lesion. These two reports have adequately explained the formation of these cystic lesions and proposed four necessary factors for their development: (1) Mildly degenerated hydrous disc; (2) Post-surgical plasticity; (3) Residual ends of annulus fibrosus; and (4) Unfixed segment^[4]. Therefore, PDP is a unique condition caused by specific circumstances after less-aggressive discectomy without fixation. To prevent it, an appropriate operation of the annulus fibrosus ends might be effective.

After reviewing the histological findings of PDP, we notice that PDP shares many features with DC, which is defined as an extradural cyst with a distinctive communication with the corresponding intervertebral disc. Hence, we review all PDP and DC cases with a histology report since 2009 (first PDP report) and identify several notable features shared by both PDP and DC (Table 2)^[9-20]. First, all DC (12 cases) and PDP (2 cases) patients who underwent histological examination of the cyst wall reported that it was composed of dense fibrous connective tissue without any specific lining cell layer. Second, 8/9 cases of DC and 3/4 cases of PDP who received histological examination of the cyst content had a serous bloody fluid inside the cyst.

Table 1 Patients with pseudocyst after lumbar discectomy

Citation	Patients	Age/gender	Previous operation	Country	Days till symptom aggravation (d)	Days till MRI detection (d)	Treatment of PDP
Young <i>et al</i> ^[1] , 2009	2	60/M; 38/M	MED; partial discectomy	US	30; 60	390; 420	No treatment; conservative
Kang <i>et al</i> ^[4] and Park <i>et al</i> ^[18]	15	20-25 M, mean 22.5	PELD	Korea	N/A	53.7	5 surgical (1 OC, 4 PELC); 10 conservative
Chung <i>et al</i> ^[2] , 2012	12	11 M, 1 F, mean 29.3	9/12 MED; 3/12 PELD	Korea	Mean 23.3 (range, 9–38)	Mean 31.2 (range, 14–60)	5 surgical (UA); 7 conservative
Jha <i>et al</i> ^[6] , 2016	2	16/M; 18/F	MED; MED	Japan	7; 7	30; 60	Conservative; conservative
Yu <i>et al</i> ^[3] , 2016	1	27/M	Open discectomy	Korea	14	21	Conservative
Prasad and Menon ^[7] , 2017	1	30/M	Discectomy	Indian	25	25	OC
Shiboi <i>et al</i> ^[8] , 2017	2	14/F; 27/M	PELD; PELD	Japan; Japan	30; 20	30; 20	PELC; MED
Manabe <i>et al</i> ^[5] , 2019	1	21/M	PELD	Japan	42	42	PELC
Present cases	1	23/M	PELD	China	40	40	Conservative

M: Male; F: Female; PDP: Postoperative discal pseudocyst; MED: Micro-endoscopic discectomy; PELD: Percutaneous endoscopic discectomy; MEC: Micro-endoscopic cystectomy; PELC: Percutaneous endoscopic cystectomy; OC: Open cystectomy; UA: Unknown approach.

Table 2 Comparison of histological results between discal cyst and post-discectomy pseudocyst cases since 2009

Location	Results	DC	PDP
Cyst wall	Dense fibrous connective tissue without specific lining cell layer	12 cases ^[9-19]	2 cases ^[2,7]
	N/A	1 case ^[20]	2 cases ^[3,8]
Content	Serous bloody fluid	8 cases ^[9-11,13-15,20]	3 cases ^[2,3,8]
	Clear fluid, similar to spinal fluid	1 case ^[12]	1 case ^[7]
	N/A	4 cases ^[16-19]	0 case
Communicating stalk	Confirmed	13 cases ^[9-20]	2 cases ^[2,3]
	N/A	0 case	2 cases ^[7,8]

DC: Discal cyst; PDP: Post-discectomy pseudocyst; N/A: No histology results.

Third, the existence of a stalk was proven in all DC (13 cases) and PDP (2 cases) patients who underwent the relevant examination. DC and PDP are not only similar in histology but also similar in epidemiological characteristics. Aydin *et al*^[9] summarized the risk factors for DC and found that DC occurs predominantly in physically active young Asian males. These findings concur with the results of our analysis of PDP cases, in which as many as 28/36 cases were Asian males aged under 30 years (Table 1). Based on these findings and comparing the features above, we speculate that PDP and DC might be the same histological entity and have the same origin, and PDP probably is a DC that is formed post-surgery. In other words, an iatrogenic annular injury during discectomy might accelerate the pathological progression of a DC. As per this hypothesis, the controversial mechanism of the formation of DC might be to some extent uncovered, and those mechanisms that can be affected by operations are more likely to lead to DC. Supported by the presence of fibrous connective tissue, the imaging finding of an annular fissure and the communication between the intervertebral disc and cyst, Kono *et al*^[21] first proposed the pseudo-membrane theory, which suggests that the process starts with a focal degeneration of the back disc wall and fluid formation, followed by fluid leakage into the epidural space and finally, the formation of the cyst. On the other hand, Matsumoto *et al*^[11] reported the presence of hemosiderin deposits within the cyst wall and indicated that the cystic lesion is

formed by inflammatory epidural venous plexus hemorrhage. Regarding the pathological mechanisms proposed by these two studies, both pseudo-membrane formation and communication in the annulus fibrosus can be induced by surgery; nevertheless, the routine application of drainage is more likely to retard the hematoma process than to accelerate it. Therefore, our study supports the hypothesis proposed by Kono *et al*^[21].

As PDP greatly resembles DC in many aspects, the management of DC illustrates the treatment of PDP. However, the ideal treatment for DC and PDP remains controversial. Among the 36 PDP cases, 21 received conservative therapy, 14 underwent cystectomy, and 1 received no further treatment. There seem to be no universally accepted surgical indications other than the tolerance of individuals and therapeutic effect of conservative treatment^[2,4]. Conservative treatments, including physical therapy, analgesics, and aspiration, were administered to those with mild to moderate symptoms, and improvement and spontaneous regression of the lesion were detected in several patients, including our case. Zekaj *et al*^[22] proposed that the communicating stalk is the key for prognosis estimation and that the cysts with a sharp turning stalk may have a higher probability of spontaneous regression^[22], which provides another clue to surgeons for devising treatment strategies for these patients.

Patients who have neurological deficits and show little improvement after receiving conservative therapy should receive surgical cystectomy. Similar to previous surgeries, micro-endoscopic cystectomy and percutaneous endoscopic lumbar cystectomy are preferred by surgeons. Reoperation of the spinal canal is usually associated with the problem of serious adhesions. Depending on the approach of the previous surgery, the dorsal and ventral spaces of the dura might be occupied with scars and inflammatory tissue, which can lead to difficulty in dissection and requires careful operation in case of a dural tear. The main limitation of the study is the small quantity of PDP histological results, and the reason is because of the severe adhesion caused by previous surgery, thus, PDP is usually resected in unclear pieces, which leads to a lack of histological results of PDP.

CONCLUSION

In summary, PDP is a rare condition that develops after less-aggressive discectomy without fixation. Here, we have described a PDP case who underwent conservative treatment, and revealed excellent outcome. By reviewing the reported literature, we found that PDP mainly occurs in physically active young Asian males and is composed of dense fibrous connective tissue without epithelial lining and bloody serous fluid as cyst wall and content, respectively, which suggests that PDP and DC have the same pathogenesis.

REFERENCES

- 1 **Young PM**, Fenton DS, Czervionke LF. Postoperative annular pseudocyst: report of two cases with an unusual complication after microdiscectomy, and successful treatment by percutaneous aspiration and steroid injection. *Spine J* 2009; **9**: e9-e15 [PMID: 18280218 DOI: 10.1016/j.spinee.2007.12.013]
- 2 **Chung D**, Cho DC, Sung JK, Choi E, Bae KJ, Park SY. Retrospective report of symptomatic postoperative discal pseudocyst after lumbar discectomy. *Acta Neurochir (Wien)* 2012; **154**: 715-722 [PMID: 2223287 DOI: 10.1007/s00701-011-1219-7]
- 3 **Yu HJ**, Park CJ, Yim KH. Successful Treatment of a Symptomatic Discal Cyst by Percutaneous C-arm Guided Aspiration. *Korean J Pain* 2016; **29**: 129-135 [PMID: 27103969 DOI: 10.3344/kjp.2016.29.2.129]
- 4 **Kang SH**, Park SW. Symptomatic post-discectomy pseudocyst after endoscopic lumbar discectomy. *J Korean Neurosurg Soc* 2011; **49**: 31-36 [PMID: 21494360 DOI: 10.3340/jkns.2011.49.1.31]
- 5 **Manabe H**, Higashino K, Sugiura K. A Rare Case of a Discal Cyst Following Percutaneous Endoscopic Lumbar Discectomy via a Transforaminal Approach. *Int J Spine Surg* 2019; **13**: 92-94 [PMID: 30805291 DOI: 10.14444/6012]
- 6 **Jha SC**, Tonogai I, Higashino K, Sakai T, Takata Y, Goda Y, Abe M, Nagamachi A, Fukuta S, Sairyo K. Postoperative discal cyst: An unusual complication after microendoscopic discectomy in teenagers. *Asian J Endosc Surg* 2016; **9**: 89-92 [PMID: 26781537 DOI: 10.1111/ases.12227]
- 7 **Prasad GL**, Menon GR. Post-discectomy annular pseudocyst: A rare cause of failed back syndrome. *Neurol India* 2017; **65**: 650-652 [PMID: 28488645 DOI: 10.4103/neuroindia.NI_558_16]
- 8 **Shiboi R**, Oshima Y, Kaneko T, Takano Y, Inanami H, Koga H. Different operative findings of cases predicted to be symptomatic discal pseudocysts after percutaneous endoscopic lumbar discectomy. *J Spine Surg* 2017; **3**: 233-237 [PMID: 28744506 DOI: 10.21037/jss.2017.05.07]

- 9 **Aydin S**, Abuzayed B, Yildirim H, Bozkus H, Vural M. Discal cysts of the lumbar spine: report of five cases and review of the literature. *Eur Spine J* 2010; **19**: 1621-1626 [PMID: [20364391](#) DOI: [10.1007/s00586-010-1395-9](#)]
- 10 **Kobayashi S**, Takeno K, Uchida K, Yayama T, Nakajima H, Miyazaki T, Guerrero A, Baba H. Pathogenesis of the discal cysts communicating with an adjacent herniated disc. Histological and ultrastructural studies of two cases. *Joint Bone Spine* 2010; **77**: 184-186 [PMID: [20138794](#) DOI: [10.1016/j.jbspin.2009.09.009](#)]
- 11 **Matsumoto M**, Watanabe K, Tsuji T, Ishii K, Takaishi H, Nakamura M, Toyama Y, Chiba K. Microendoscopic resection of lumbar discal cysts. *Minim Invasive Neurosurg* 2010; **53**: 69-73 [PMID: [20533137](#) DOI: [10.1055/s-0030-1249052](#)]
- 12 **Lin N**, Schirmer CM, Proctor MR. Presentation and progression of a disc cyst in a pediatric patient. *J Neurosurg Pediatr* 2011; **7**: 209-212 [PMID: [21284469](#) DOI: [10.3171/2010.11.PEDS10227](#)]
- 13 **Hyung-Jun K**, Dae-Yong K, Tae-Ho K, Ho-Sang P, Jae-Sung K, Jae-Won J, Jung-Kil L. Lumbar discal cyst causing bilateral radiculopathy. *Surg Neurol Int* 2011; **2**: 21 [PMID: [21427789](#) DOI: [10.4103/2152-7806.77026](#)]
- 14 **Shibata S**, Hanakita J, Takahashi T, Minami M, Kuraishi K, Watanabe M. Bilateral discal cysts managed by partial hemilaminectomy and microscopic resection of hemilateral cyst. *Spine (Phila Pa 1976)* 2011; **36**: E1655-E1658 [PMID: [21301393](#) DOI: [10.1097/BRS.0b013e3182134b77](#)]
- 15 **Khalatbari MR**, Moharamzad Y. Discal cyst in pediatric patients: case report and review of the literature. *Neuropediatrics* 2012; **43**: 289-292 [PMID: [22941777](#) DOI: [10.1055/s-0032-1324742](#)]
- 16 **Ha SW**, Ju CI, Kim SW, Lee S, Kim YH, Kim HS. Clinical outcomes of percutaneous endoscopic surgery for lumbar discal cyst. *J Korean Neurosurg Soc* 2012; **51**: 208-214 [PMID: [22737300](#) DOI: [10.3340/jkns.2012.51.4.208](#)]
- 17 **Bansil R**, Hirano Y, Sakuma H, Watanabe K. Transition of a herniated lumbar disc to lumbar discal cyst: A case report. *Surg Neurol Int* 2016; **7**: S701-S704 [PMID: [27843689](#) DOI: [10.4103/2152-7806.191081](#)]
- 18 **Park JW**, Lee BJ, Jeon SR, Rhim SC, Park JH, Roh SW. Surgical Treatment of Lumbar Spinal Discal Cyst: Is It Enough to Remove the Cyst Only without Following Discectomy? *Neurol Med Chir (Tokyo)* 2019; **59**: 204-212 [PMID: [31068543](#) DOI: [10.2176/nmc.0a.2018-0219](#)]
- 19 **Chen S**, Suo S, Li C, Wang Y, Li J, Zhang F, Zhang W. Clinical Application of Percutaneous Transforaminal Endoscopic Surgery in Lumbar Discal Cyst. *World Neurosurg* 2020; **138**: e665-e673 [PMID: [32194264](#) DOI: [10.1016/j.wneu.2020.03.048](#)]
- 20 **Lame A**, Kaloshi G, Xhumari A, Vreto G, Petrela M. Insights on the natural history and pathogenesis of multilevel discal cysts. *J Clin Neurosci* 2012; **19**: 617-619 [PMID: [22277564](#) DOI: [10.1016/j.jocn.2011.05.037](#)]
- 21 **Kono K**, Nakamura H, Inoue Y, Okamura T, Shakudo M, Yamada R. Intraspinal extradural cysts communicating with adjacent herniated disks: imaging characteristics and possible pathogenesis. *AJNR Am J Neuroradiol* 1999; **20**: 1373-1377 [PMID: [10473000](#)]
- 22 **Zekaj E**, Franzini A, Bona AR, Servello D. Spontaneous regression of a discal cyst: a physiopathological hypothesis. *J Neurosurg Sci* 2020; **64**: 304-307 [PMID: [29808633](#) DOI: [10.23736/S0390-5616.18.04427-2](#)]



Published by **Baishideng Publishing Group Inc**
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA

Telephone: +1-925-3991568

E-mail: bpgoffice@wjgnet.com

Help Desk: <https://www.f6publishing.com/helpdesk>

<https://www.wjgnet.com>

