ScientificScholar®
Knowledge is power
Publisher of Scientific Journals

www.surgicalneurologyint.com

Surgical Neurology International

Editor-in-Chief: Nancy E. Epstein, MD, Clinical Professor of Neurological Surgery, School of Medicine, State U. of NY at Stony Brook.

SNI: Spine

Editor
Nancy E. Epstein, MD
Clinical Professor of Neurological Surgery, School of Medicine, State U. of NY at Stony Brook

SNI
Open Access

Review Article

Repeat discectomy for recurrent same level disc herniation: A literature review of the past 5 years

Gerald Musa[1], Rossi E.C Barrientos[1], Serik K. Makirov[2], Gennady E. Chmutin[1], Gennady I. Antonov[3], Alexander V. Kim[4], Olzhas Otarov[5]

[1]Department of Neurological Diseases and Neurosurgery, Peoples Friendship University of Russia, [2]Department of Traumatology and Orthopedics, Spinal Surgery, Scientific and Technical Center, Family Clinic, [3]3 Central Military Clinical Hospital named after A.A Vishnevsky, of the Ministry of Defense of the Russian Federation, [4]Department of Neurosurgery, City Clinical Hospital 68 Named after Demihov, [5]Department of Orthopedics and Traumatology, Scientific and Technical Center, Family Clinic, Moscow, Russia.

E-mail: Gerald Musa - gerryMD@outlook.com; *Rossi Evelyn Barrientos Castillo - rossiebarrientoscastillo@gmail.com; Serik K. Makirov - makirovsk@mail.ru; Gennady E. Chmutin - neuro2009@yandex.ru; Gennady I. Antonov - a.g.i@bk.ru; Alexander V. Kim - dr_alexkim@mail.ru; Olzhas Otarov - ol_otarov@mail.ru

***Corresponding author:**
Rossi Evelyn Barrientos Castillo, Neurosurgery Resident, Department of Neurological Diseases and Neurosurgery Peoples Friendship University of Russia, Moscow, Russia.

rossiebarrientoscastillo@gmail.com

Received : 17 February 2023
Accepted : 06 March 2023
Published : 24 March 2023

DOI
10.25259/SNI_168_2023

Quick Response Code:

ABSTRACT

Background: Recurrent disc herniations remain a challenge in spinal surgery. Although some authors recommend a repeat discectomy, others offer more invasive secondary fusions. Here, we reviewed the literature (2017–2022) regarding the safety/efficacy of treating recurrent disc herniations with repeated discectomy alone.

Methods: Our literature search of recurrent lumbar disc herniations included; Medline, PubMed, Google scholar, and the Cochrane database. We focused on the types of discectomy performed, perioperative morbidity, costs, length of surgery, pain scores, and incidence of secondary dural tears.

Results: We identified 769 cases that included 126 microdiscectomies, and 643 endoscopic discectomies. Rates of disc recurrence ranged from 1% to 25% with accompanying secondary durotomy varying from 2% to 15%. In addition, operative times were relatively short, ranging from 29.2 min to 125 min, with a relatively small average estimated blood loss (i.e., minimal to maximally 150 mls).

Conclusion: Repeated discectomy was the most commonly performed treatment for same-level recurrent disc herniations. Despite minimal intraoperative blood loss and short operating times, there was a significant risk of durotomy. Notably, patients must be informed that more extensive bone removal for treating recurrent disc increases the risk for instability warranting subsequent fusion.

Keywords: Degenerative disc disease, Disc herniation, Recurrent herniation, Spinal instability

INTRODUCTION

The optimal management of recurrent lumbar disc herniations (incidence 10–30%) remains controversial. The multiple discectomy methods include; routine open diskectomy, microdiscectomy and endoscopic discectomy.[1,8] Although repeat discectomy alone has several advantages (i.e., less invasive, shorter hospital stay, and reduced cost), a subset of up to 25% of these patients may later develop instability warranting fusions.[2,6,9] Here, we reviewed the literature over the past 5 years for treating recurrent lumbar discs with repeated diskectomy alone.

This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, transform, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.
©2023 Published by Scientific Scholar on behalf of Surgical Neurology International

Table 1: A summary the reviewed articles and collected data.

Author	No.	Sex		Type of discectomy		Complication		Operative time (min)		Blood loss (mL)	
		M	F	Micro	Endoscopy	Durotomy %	Recurrence %	Microdiscectomy	Endoscopic	Microdiscectomy	Endoscopic
Yoshikane *et al.* 2021	52	13	39		52	1	5.80				
Yao *et al.* 2017	47	20	27		47	8.51	10.64		33.0–33.7		NA
Wang and Yu *et al.* 2020	24	14	10		24	8.33	20.83		63.38±20.25		Not measurable
Yao *et al.* 2017	48	20	28		48	MED 10.00 - PELD 14.29	MED 15 - PELD 25		113.3±45.44		17.75±17.05
Lee *et al.* 2017	83	40	43	48	35	9	PELD 2.4 - Micro 8.4		MED 85.25±41.60 - PELD 75.00±31.56		Not measurable
Liu *et al.* 2020	24	10	14		24	2	4.20	NA	NA	NA	
Goker and Aydin 2020	60	43	17	36	24	FEID 5.2 - MD 5.6	FEID 5.2 - Micro 5.6		72.4 (45–125)		Minimal
Kang *et al.* 2020	36	21	15	20	16	Endo 6.3 - Open 15	Endo 12.5 - Micro 15	36.8±11.4	29.2±9.0	NA	Not measurable
Ahsan *et al.* 2020	22	15	7	22		5	4.60	58.00±7.33	52.81±5.76	NA	NA
Fujita *et al.* 2022	373	277	96		373	MED 2.8	MED 6.4 - FED 5.6	95.0 (65–125)	MED 59.3±27.0 - FED 47.7±19.9		MED 14.0±45.5 - FED 6.1±26.7
Total	769	473	296	126	643	1–15	2.4–25				

NA: Not available, MED: Microscope assisted endoscopic discectomy, PELD: Percutaneous endoscopic lumbar discectomy, FED: Full endoscopic discectomy; M: Male; F: Female

Table 2: The demographic data and the type of discectomy performed.

Author	Number	Sex		Type of discectomy	
		M	F	Microdiscectomy	Endoscopy
Yoshikane *et al*. 2021	52	13	39		52
Yao *et al*. 2017	47	20	27		47
Wang *et al*. 2020	24	14	10		24
Yao *et al*. 2017	48	20	28		48
Lee *et al*. 2017	83	40	43	48	35
Liu *et al*. 2020	24	10	14		24
Goker and Aydin 2020	60	43	17	36	24
Kang *et al*. 2020	36	21	15	20	16
Ahsan *et al*. 2020	22	15	7	22	
Fujita *et al*. 2022	373	277	96		373
Total	769	473	296	126	643

M: Male; F: Female

Table 3: The rates of durotomy and recurrence following repeat discectomy.

Author	Durotomy %	Recurrence %
Yoshikane *et al*. 2021	1	5.80
Yao *et al*. 2017	8.51	10.64
Wang *et al*. 2020	8.33	20.83
Yao *et al*. 2017	MED 10.00 - PELD 14.29	MED 15 - PELD 25
Lee *et al*. 2017	9	PELD 2.4 - Micro 8.4
Liu *et al*. 2020	2	4.20%
Goker and Aydin 2020	FEID 5.2 - MD 5.6	FEID 5.2 - Micro 5.6
Kang *et al*. 2020	Endo 6.3 - Open 15	Endo 12.5 - Micro 15
Ahsan *et al*. 2020	5	4.60%
Fujita *et al*. 2022	MED 2.8	MED 6.4 - FED 5.6
	1–15	2.4–25

MED: Microendoscopic discectomy; FEID: Full endoscopic interlaminar discectomy; MD: Microsurgical discectomy; FED: Full-endoscopic discectomy; Endo: Endoscopic; Open: Open microscopic; NA: Not available; Micro: Microsurgical, PELD: Percutaneous endoscopic lumbar discectomy,

Table 4: The operative time and intraoperative blood loss.

Operative time (min)		Blood loss (mL)	
Microdiscectomy	Endoscopic	Microdiscectomy	Endoscopic
	33.0–33.7		NA
	63.38±20.25		Not measurable
	113.3±45.44		17.75±17.05
	MED 85.25±41.60/PELD 75.00±31.56		Not measurable
NA	NA	NA	
	72.4 (45–125)		Minimal
36.8±11.4	29.2±9.0	NA	Not measurable
58.00±7.33	52.81±5.76	NA	NA
95.0 (65–125)		85 (70–150)	
	MED 59.3±27.0/FED 47.7±19.9		MED 14.0±45.5/FED 6.1±26.7

NA: Not available; MED: Microscope assisted endoscopic discectomy; PELD: Percutaneous endoscopic lumbar discectomy: FED: Full endoscopic discectomy

MATERIALS AND METHODS

A non-systematic MEDLINE search for the literature (2017–2022) was performed on Google Scholar, clinical trials, and PubMed using the keywords "discectomy for recurrent herniation," "recurrent disc herniation", "repeat discectomy", and "re-herniation management." Articles had to include more than ten patients who underwent discectomy for recurrent disc herniations. Variables studied included; demographic, clinical, surgical, and outcome data (i.e., including postoperative complications, and disc recurrence rates). There were also multiple exclusions [Table 1].

RESULTS

The ten studies included 769 patients, who underwent; 126 microdiscectomies and 643 endoscopic discectomies (i.e., 269 microscope assisted endoscopic discectomy and 200 full endoscopic interlaminar endoscopy) [Table 2]. No patients had open discectomy. The disc recurrence rate ranged from 1% to 25%, and the most common complication was durotomy (2–15%) [Table 3]. Operative times and blood loss were also measured [Table 4].

DISCUSSION

The major options for treating recurrent lumbar disc herniations (rates ranging from 2.4 to 25%), include open procedures, microdiskectomies, or endoscopic approaches.[4,5,8] These repeat surgeries require variable operative times (i.e., range 29 min to 113.3 ± 45.44 min) and usually incur significant additional risks due to scar, including intraoperative durotomy (2%[3] to 15%), and hemorrhage.[3,10] An estimated 25% of patient who present with recurrent discs already exhibit instability, warranting consideration of simultaneous fusion that could increase perioperative morbidity and costs.[4,7]

CONCLUSION

Recurrent lumbar disc herniations may be managed with repeat diskectomy without fusion. Nevertheless, repeat diskectomies alone, although minimizing blood loss and operative times, typically require greater bone removal to adequately expose recurrent disc fragments increases the risk of postoperative instability.

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Ahsan MK, Hossain MR, Khan MS, Zaman N, Ahmed N, Montemurro N, *et al*. Lumbar revision microdiscectomy in patients with recurrent lumbar disc herniation: A single-center prospective series. Surg Neurol Int 2020;11:404.
2. Fujita M, Inui T, Oshima Y, Iwai H, Inanami H, Koga H. Comparison of the outcomes of microendoscopic discectomy versus full-endoscopic discectomy for the treatment of L4/5 lumbar disc herniation. Global Spine J 2022:21925682221127997.
3. Goker B, Aydin S. Endoscopic surgery for recurrent disk herniation after microscopic or endoscopic lumbar diskectomy. Turk Neurosurg 2020;30:112-8.
4. Kang MS, Hwang JH, Choi DJ, Chung HJ, Lee JH, Kim HN, *et al*. Clinical outcome of biportal endoscopic revisional lumbar diskectomy for recurrent lumbar disk herniation. J Orthop Surg Res 2020;15:557.
5. Lee JS, Kim HS, Pee YH, Jang JS, Jang IT. Comparison of percutaneous endoscopic lumbar diskectomy and open lumbar microdiskectomy for recurrent lumbar disk herniation. J Neurol Surg A Cent Eur Neurosurg 2018;79:447-52.
6. Liu KC, Hsieh MH, Yang CC, Chang WL, Huang YH. Full endoscopic interlaminar discectomy (FEID) for recurrent lumbar disc herniation: Surgical technique, clinical outcome, and prognostic factors. J Spine Surg 2020;6:483-94.
7. Wang A, Yu Z. Comparison of percutaneous endoscopic lumbar diskectomy with minimally invasive transforaminal lumbar interbody fusion as a revision surgery for recurrent lumbar disk herniation after percutaneous endoscopic lumbar diskectomy. Ther Clin Risk Manag 2020;16:1185-93.
8. Yao Y, Zhang H, Wu J, Liu H, Zhang Z, Tang Y, *et al*. Comparison of three minimally invasive spine surgery methods for revision surgery for recurrent herniation after percutaneous endoscopic lumbar diskectomy. World Neurosurg 2017;100:641-7.e1.
9. Yao Y, Zhang H, Wu J, Liu H, Zhang Z, Tang Y, *et al*. Minimally invasive transforaminal lumbar interbody fusion versus percutaneous endoscopic lumbar discectomy: Revision surgery for recurrent herniation after microendoscopic discectomy. World Neurosurg 2017;99:89-95.
10. Yoshikane K, Kikuchi K, Izumi T, Okazaki K. Full-endoscopic lumbar diskectomy for recurrent lumbar disk herniation: A retrospective study with patient-reported outcome measures. Spine Surg Relat Res 2021;5:272-7.

How to cite this article: Musa G, Barrientos Castillo RE, Makirov SK, Chmutin GE, Antonov GI, Kim AV, *et al.* Repeat discectomy for recurrent same level disc herniation: A literature review of the past 5 years. Surg Neurol Int 2023;14:100.

Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Journal or its management. The information contained in this article should not be considered to be medical advice; patients should consult their own physicians for advice as to their specific medical needs.