

Supplementary Table 1: Summary of reported cases of posterior epidural migration of disc fragment.

Author, Year	Sex, Age	Level	Spine disorders	Other comorbidities	Imaging
Lombardi, 1973 ^[9]	M,54	L4–L5			Myelography
Lombardi, 1973 ^[9]	M,58	L2–L3			Myelography
Sekerci <i>et al.</i> , 1992 ^[10]	M,58	L3–L4	LBP		X-rays, Myelography
Sakas <i>et al.</i> , 1995 ^[11]	M,70	L4–L5			CT
Robe <i>et al.</i> , 1999 ^[13]	M,68	L3–L4			X-ray, CT, Myelography, MRI
Saruhashi <i>et al.</i> , 1999 ^[12]	F,44	L5–S1			MRI
Eysel and Herbstrofer, 2001 ^[14]	M,41	L3–L4			
Eysel and Herbstrofer, 2001 ^[14]	F,37	L3–L4			
Eysel and Herbstrofer, 2001 ^[14]	M,45	L4–L5			MRI
Sen <i>et al.</i> , 2001 ^[15]	M,36	L4–L5	LBP		MRI w cont
Şenel <i>et al.</i> , 2003 ^[16]	M,44	L3–L4			MRI w cont
Walsh <i>et al.</i> , 2004 ^[17]	M,62	L2–L3, L3–L4	Chronic LBP, left side laminectomy L4–L5		MRI w cont
Tatlı, <i>et al.</i> 2005 ^[18]	M,53	L3–L4			MRI w cont
Tatlı, <i>et al.</i> 2005 ^[18]	M,54	L5–S1			MRI
El Asri, <i>et al.</i> 2008 ^[19]	M,36	L5–S1			CT
El Asri, <i>et al.</i> 2008 ^[19]	M,42	L5–S1			CT
Carvi y Nievas and Hoellerhage, 2009 ^[20]	M,72	L1–L2			MRI
Carvi y Nievas and Hoellerhage, 2009 ^[20]	F,59	C6–C7			MRI
Carvi y Nievas and Hoellerhage, 2009 ^[20]	M,83	L2–L4			MRI
Carvi y Nievas and Hoellerhage, 2009 ^[20]	M,45	L3–L4			MRI
Carvi y Nievas and Hoellerhage, 2009 ^[20]	M,67	L4–L5			MRI
Carvi y Nievas and Hoellerhage, 2009 ^[20]	F,60	L4–L5			MRI
Carvi y Nievas and Hoellerhage, 2009 ^[20]	F,58	L5–S1			MRI
Carvi y Nievas and Hoellerhage, 2009 ^[20]	F,71	T12–L1			MRI
Derinçek <i>et al.</i> , 2009 ^[21]	F,60	L1–L2		Bilateral gonarthrosis	MRI
Teufack <i>et al.</i> 2010 ^[5]	M,49	L4–L5			MRI w cont
Akhaddar <i>et al.</i> , 2011 ^[24]	F,60	L2–L3			MRI
Akhaddar <i>et al.</i> 2011 ^[24]	M,59	L5–S1			MRI, CT
Akhaddar <i>et al.</i> , 2011 ^[24]	M,67	L3–L4			MRI, CT
Akhaddar <i>et al.</i> , 2011 ^[24]	M,43	L3–L4			CT

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Supplementary Table 1: (Continued).

Author, Year	Sex, Age	Level	Spine disorders	Other comorbidities	Imaging
Akhaddar <i>et al.</i> , 2011 ^[24]	M,48	L3–L4			MRI
Akhaddar <i>et al.</i> , 2011 ^[24]	M,35	L4–L5			CT
Hur <i>et al.</i> , 2011 ^[23]	M,50	L3–L4	Discectomy L4–5 ten years ago, chronic LBP		MRI
Hur <i>et al.</i> , 2011 ^[23]	F,60	L1–L2			MRI
Hur <i>et al.</i> , 2011 ^[23]	M,69	L2–L3	Infective spondylitis		MRI
Sengoz <i>et al.</i> , 2011 ^[25]	M,54	L3–L4			
Sengoz <i>et al.</i> , 2011 ^[25]	M,34	L4–L5			
Sengoz <i>et al.</i> , 2011 ^[25]	F,44	L3–L4			
Sengoz <i>et al.</i> , 2011 ^[25]	M,39	L3–L4			
Sengoz <i>et al.</i> , 2011 ^[25]	M,42	L3–L4			MRI w cont
Sengoz <i>et al.</i> , 2011 ^[25]	M,55	L4–L5			
Sengoz <i>et al.</i> , 2011 ^[25]	M,72	L3–L4	10 year LBP	Diabetes, prosthetic heart valve,	CT
Sengoz <i>et al.</i> , 2011 ^[25]	F,43	L3–L4			CT
Gonçalves <i>et al.</i> , 2012 ^[26]	M,51	L2–L3	3 years LBP	DM, IRC	x-rays, MRI
Ba <i>et al.</i> , 2014 ^[27]	M,48	L4–L5	Chronic LBP		MRI w cont
Ba <i>et al.</i> , 2014 ^[27]	M,47	L4–L5			MRI
Ba <i>et al.</i> , 2014 ^[27]	M,52	L4–L5			CT
Ba <i>et al.</i> , 2014 ^[27]	M,42	L4–L5	2 months sciatica		MRI
Rahimizadeh <i>et al.</i> , 2013 ^[28]	M,57	L3–L4			MRI
Rahimizadeh <i>et al.</i> , 2013 ^[28]	M,53	L4–L5			MRI
Tarukado <i>et al.</i> 2015 ^[30]	M,62	L2–L3			MRI
Tarukado <i>et al.</i> 2015 ^[30]	M,83	L2–L3	1 month LBP		MRI
Tarukado <i>et al.</i> 2015 ^[30]	M,53	L3–L4			MRI
Tarukado <i>et al.</i> 2015 ^[30]	M,79	L4–L5			MRI
Abe <i>et al.</i> , 2015 ^[31]	M,65	L4–L5	Cervical laminoplasty (C3–4) 1 year before. His history showed lumbar canal stenosis at L4–5		MRI
Abe <i>et al.</i> , 2015 ^[31]	M,73	L4–L5	2-year LBP and RP		MRI
Li <i>et al.</i> , 2016 ^[34]	M,48	L5–S1	4 years LBP		CT, MRI w cont
Yoo <i>et al.</i> , 2015 ^[29]	M,32	L2–L3			MRI
Ajayi <i>et al.</i> , 2016 ^[33]	F,65	L3–L4	LBP, RP	Obesity and pulmonary fibrosis	MRI
Damjibhai Diyora <i>et al.</i> , 2016 ^[35]	M,44	L3–L4, L4–L5			MRI
Turan <i>et al.</i> , 2015 ^[32]	F,32	L5–S1	Intermittent LBP for 6 months		MRI
Turan <i>et al.</i> , 2015 ^[32]	M,51	L4–L5			MRI
Turan <i>et al.</i> , 2015 ^[32]	M,41	L3–L4			MRI
Turan <i>et al.</i> , 2015 ^[32]	M,58	L2–L3			MRI
Turan <i>et al.</i> , 2015 ^[32]	M,56	L3–L4			MRI

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Supplementary Table 1: (Continued).

Author, Year	Sex, Age	Level	Spine disorders	Other comorbidities	Imaging
Turan <i>et al.</i> , 2015 ^[32]	M,70	L3–L4			CT
Turan <i>et al.</i> , 2015 ^[32]	M,28	L4–L5			MRI
Turan <i>et al.</i> , 2015 ^[32]	F,48	L4–L5			MRI
Turan <i>et al.</i> , 2015 ^[32]	M,62	L3–L4			MRI
Zarrabian <i>et al.</i> , 2016 ^[36]	M,69	L2–L3			MRI
Zarrabian <i>et al.</i> , 2016 ^[36]	M,77	L3–L4			MRI w cont
Zarrabian <i>et al.</i> , 2016 ^[36]	M,48	L4–L5			MRI w cont
Zarrabian <i>et al.</i> , 2016 ^[36]	M,60	L4–L5			MRI
Zarrabian <i>et al.</i> , 2016 ^[36]	M,61	L3–L4			MRI
Zarrabian <i>et al.</i> , 2016 ^[36]	M,35	L4–L5			MRI
Deora <i>et al.</i> , 2017 ^[38]	M,52	L3–L4			MRI
Deora <i>et al.</i> , 2017 ^[38]	M,60	L3–L4			MRI
Deora <i>et al.</i> , 2017 ^[38]	M,57	L3–L4			MRI
Kutty <i>et al.</i> , 2017 ^[37]	M,57	L2–L3	Transforaminal epidural block at L2–3 at a local hospital.	Previous infarction and essential hypertension	MRI
Elsharkawy <i>et al.</i> , 2018 ^[45]	M,78	L1–L2	4 months LBP, RP		MRI
Frioui and Khachnaoui, 2018 ^[41]	,29	L3–L4			MRI
Hawkins <i>et al.</i> , 2018 ^[43]	M,40	L4–L5	chronic LBP		MRI
Kim <i>et al.</i> , 2018 ^[46]	M,76	L2–L3			MRI, PES, MEP
Montalvo Afonso <i>et al.</i> , 2018 ^[42]	M,45	L4–L5			MRI w cont
Montalvo Afonso <i>et al.</i> , 2018 ^[42]	M,64	L3–L4			EMG and MRI
Montalvo Afonso <i>et al.</i> , 2018 ^[42]	M,33	L4–L5	L5–S1 listhesis		MRI
Park <i>et al.</i> , 2018 ^[39]	M,76	L2–L3			MRI w cont
Tamburrelli <i>et al.</i> , 2018	M,53	L3–L4			CT, MRI
Tamburrelli <i>et al.</i> , 2018	M,49	T6–T7			MRI
Himmiche <i>et al.</i> , 2019 ^[49]	M,50	L4–L5	LBP	Psychosis	MRI
Hur <i>et al.</i> , 2019 ^[47]	M,65	T10–T11			MRI
Mugge <i>et al.</i> , 2019 ^[48]	M,19	L3–L4		DM I	MRI
Mallepally <i>et al.</i> , 2020 ^[52]	M,72	L5–S1	LBP		MRI
Theodorou <i>et al.</i> , 2022 ^[58]	M,72	L2–L3			MRI
Theodorou <i>et al.</i> , 2022 ^[58]	M,26	L4–L5			MRI
Theodorou <i>et al.</i> , 2022 ^[58]	F,33	L4–L5			MRI
Chang <i>et al.</i> , 2024 ^[54]	F,55	L4–L5	L3–L4 listhesis		MRI
Jain <i>et al.</i> , 2020 ^[51]	F,39	L1–L2			MRI
Passanisi <i>et al.</i> , 2021 ^[53]	M,49	L4–L5	LBP 6 months		MRI w cont
Kanbara <i>et al.</i> , 2024 ^[55]	M, 69	T10–T11	T11–iliac fixation		MRI, CT, Myelography
Ayyappan Unnithan, 2022 ^[56]	M, 41	L4–L5			MRI w cont

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Supplementary Table 1: (Continued).

Author, Year	Sex, Age	Level	Spine disorders	Other comorbidities	Imaging
Ayyappan Unnithan, 2022 ^[56]	M, 67	L4–L5			MRI w cont
Elmi Saad <i>et al.</i> , 2024 ^[57]		L4–L5			MRI
Author, Year	Differential diagnosis	Clinical presentation	Surgery	Outcome	
Lombardi, 1973 ^[9]		LBP, MI, SI, HR	Total laminectomy	FR	
Lombardi, 1973 ^[9]		LBP, MI, SI, HR, UR	Total laminectomy	FR	
Sekerci <i>et al.</i> , 1992 ^[10]	No	MI, SI, HR, UR	Total laminectomy L3–L4–L5 and herniectomy	IM	
Sakas <i>et al.</i> , 1995 ^[11]	Synovial cyst	LBP, MI	L4–L5		
Robe <i>et al.</i> , 1999 ^[13]		SI	L4–L5 laminectomy and dec	NR	
Saruhashi <i>et al.</i> , 1999 ^[12]	Dumbbell tumor	LBP	L4–L5 Dorsolateral showed epidural mass connected to the L5/S1 intervertebral disc	FR	
Eysel and Herbstrofer, 2001 ^[14]	Tumor	LBP		FR	
Eysel and Herbstrofer, 2001 ^[14]	Tumor	LBP		FR	
Eysel and Herbstrofer, 2001 ^[14]	Lipoma	LBP, MI, SI, HR, UR	Inter laminotomy L3–4	PR	
Sen <i>et al.</i> , 2001 ^[15]		LBP, MI, SI, HR, UR	Total laminectomy L4 and L4–L5 discectomy	FR	
Şenel <i>et al.</i> , 2003 ^[16]	Tumor or abscess	LBP	Partial hemilaminectomy right L3	FR	
Walsh <i>et al.</i> , 2004 ^[17]		LBP, MI, SI, HR, UR	Bilateral complete laminectomy both levels	IM	
Tatlı, <i>et al.</i> 2005 ^[18]		LBP, MI, SI, HR, UR	L3 Laminectomy	FR	
Tatlı, <i>et al.</i> 2005 ^[18]		LBP, MI, HR, UR	L5 Laminectomy	IM	
El Asri, <i>et al.</i> 2008 ^[19]		LBP, MI, SI, UR	L5 Laminectomy and discectomy	IM	
El Asri, <i>et al.</i> 2008 ^[19]		LBP, MI, SI	L5 Laminectomy and discectomy	IM	
Carvi y Nievias and Hoellerhage, 2009 ^[20]	Tumor, hematoma		Hemilaminectomy	FR	
Carvi y Nievias and Hoellerhage, 2009 ^[20]	Hematoma		2 Levels hemilaminectomy, AD	FR	
Carvi y Nievias and Hoellerhage, 2009 ^[20]	Synovial cyst		Hemilaminectomy+ discectomy	FR	

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Supplementary Table 1: (Continued).

Author, Year	Differential diagnosis	Clinical presentation	Surgery	Outcome
Carvi y Nievas and Hoellerhage, 2009 ^[20]	Tumor		Partial laminotomy	FR
Carvi y Nievas and Hoellerhage, 2009 ^[20]	Synovial cyst, tumor		Hemilaminotomy, pt facetectomy	FR
Carvi y Nievas and Hoellerhage, 2009 ^[20]	Epidural metastasis		Hemilaminectomy, undercutting	FR
Carvi y Nievas and Hoellerhage, 2009 ^[20]	Meningioma		Partial laminotomy	FR
Carvi y Nievas and Hoellerhage, 2009 ^[20]	Meningioma		Hemilaminectomy	PR
Derincek <i>et al.</i> , 2009 ^[21]	Abscess, epidural tumor	LBP, MI	Hemilaminectomy	FR
Teufack <i>et al.</i> 2010 ^[5]		LBP, MI	Laminectomy	FR
Akhaddar <i>et al.</i> , 2011 ^[24]	Epidural abscess or tumor	LBP, MI, SI, UR	Laminectomy	FR
Akhaddar <i>et al</i> 2011 ^[24]		LBP, RP, MI, SI, HR	2 Laminectomy and discectomy	FR
Akhaddar <i>et al.</i> , 2011 ^[24]		LBP, RP, MI, SI, HR	2 Laminectomy and discectomy	FR
Akhaddar <i>et al.</i> , 2011 ^[24]		LBP, RP, MI, SI, HR, UR	2 Laminectomy	IM
Akhaddar <i>et al.</i> , 2011 ^[24]		LBP, RP, MI, SI, HR	Laminectomy and discectomy	IM
Akhaddar <i>et al.</i> , 2011 ^[24]		LBP, RP, MI, SI, HR	2 Laminectomy and discectomy	IM
Hur <i>et al.</i> , 2011 ^[23]		MI, SI, RP	Endoscopic laminectomy	FR
Hur <i>et al.</i> , 2011 ^[23]		LBP, RP, MI, SI	Endoscopic laminectomy	IM
Hur <i>et al.</i> , 2011 ^[23]		LBP, RP, MI, HR	Endoscopic laminectomy	IM
Sengoz <i>et al.</i> , 2011 ^[25]		LBP, RP, UR	Hemilaminectomy	FR
Sengoz <i>et al.</i> , 2011 ^[25]		LBP, RP, UR	Hemilaminectomy	FR
Sengoz <i>et al.</i> , 2011 ^[25]		LBP, RP	Hemilaminectomy	IM
Sengoz <i>et al.</i> , 2011 ^[25]		LBP, RP, UR	Hemilaminectomy	PR
Sengoz <i>et al.</i> , 2011 ^[25]	Tumor	LBP, MI, SI, HR, UR	Hemilaminotomy	IM
Sengoz <i>et al.</i> , 2011 ^[25]		LBP, RP, UR	Hemilaminectomy	IM
Sengoz <i>et al.</i> , 2011 ^[25]		LBP, RP, UR	Minihemilaminotomy	IM
Sengoz <i>et al.</i> , 2011 ^[25]		LBP, RP, MI, SI, HR, UR	Laminectomy	IM
Gonçalves <i>et al.</i> , 2012 ^[26]	Epidural hematoma, epidural empyema, nerve sheath tumor and meningioma were included in the differential diagnosis		Hemilaminectomy	FR
Ba <i>et al.</i> , 2014 ^[27]		RP, MI, SI, UR	Laminectomy and discectomy	FR
Ba <i>et al.</i> , 2014 ^[27]		LBP, RP, MI, SI, HR, UR	Laminectomy	IM

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Supplementary Table 1: (Continued).

Author, Year	Differential diagnosis	Clinical presentation	Surgery	Outcome
Ba <i>et al.</i> , 2014 ^[27]		LBP, RP, MI, SI, HR, UR	Laminectomy	IM
Ba <i>et al.</i> , 2014 ^[27]		RP, MI, SI, UR	Laminectomy	PR
Rahimizadeh <i>et al.</i> , 2013 ^[28]		RP, MI	Laminectomy	FR
Rahimizadeh <i>et al.</i> , 2013 ^[28]	Synovial cyst	LBP, RP, MI, SI, UR	Laminectomy and discectomy	FR
Tarukado <i>et al.</i> 2015 ^[30]		LBP, RP	NO	FR
Tarukado <i>et al.</i> 2015 ^[30]		SI	NO	FR
Tarukado <i>et al.</i> 2015 ^[30]		LBP, RP, MI, SI	Laminotomy	FR
Tarukado <i>et al.</i> 2015 ^[30]		RP, MI, SI	NO	FR
Abe <i>et al.</i> , 2015 ^[31]		MI, RP	Left laminectomy	IM
Abe <i>et al.</i> , 2015 ^[31]		LBP, MI	Laminectomy d unroofed right L5 root	IM
Li <i>et al.</i> , 2016 ^[34]		RP, MI, SI, HR, UR	Laminectomy	IM
Yoo <i>et al.</i> , 2015 ^[29]	Intraspinal facet cyst	LBP, MI, SI	Laminectomy	IM
Ajayi <i>et al.</i> , 2016 ^[33]		MI, SI, HR	Laminectomy	FR
Damjibhai Diyora <i>et al.</i> , 2016 ^[35]		LBP, UR	Laminectomy	FR
Turan <i>et al.</i> , 2015 ^[32]		LBP, RP, MI, SI, HR, UR	Laminectomy and discectomy	FR
Turan <i>et al.</i> , 2015 ^[32]				FR
Turan <i>et al.</i> , 2015 ^[32]		LBP, RP, MI, SI, HR, UR	Hemilaminectomy and discectomy	IM
Turan <i>et al.</i> , 2015 ^[32]				IM
Turan <i>et al.</i> , 2015 ^[32]				IM
Turan <i>et al.</i> , 2015 ^[32]				IM
Turan <i>et al.</i> , 2015 ^[32]				IM
Turan <i>et al.</i> , 2015 ^[32]				PR
Zarrabian <i>et al.</i> , 2016 ^[36]	Synovial cyst	LBP, RP, MI	Laminectomy	FR
Zarrabian <i>et al.</i> , 2016 ^[36]	Epidural hematoma, synovial cyst, or sequela of a recent epidural injection	LBP, RP, MI	Laminectomy	FR
Zarrabian <i>et al.</i> , 2016 ^[36]	Abscess	LBP, RP, SI	Laminectomy	FR
Zarrabian <i>et al.</i> , 2016 ^[36]	Abscess		Laminectomy	FR
Zarrabian <i>et al.</i> , 2016 ^[36]	Epidural hematoma	LBP, MI	Laminectomy	IM
Zarrabian <i>et al.</i> , 2016 ^[36]			Laminectomy	IM
Deora <i>et al.</i> , 2017 ^[38]		LBP, MI, SI, HR, UR	Laminectomy	FR
Deora <i>et al.</i> , 2017 ^[38]		MI, UR	Laminectomy	FR
Deora <i>et al.</i> , 2017 ^[38]		MI, SI, HR, UR	Laminectomy	IM

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Supplementary Table 1: (Continued).

Author, Year	Differential diagnosis	Clinical presentation	Surgery	Outcome
Kutty <i>et al.</i> , 2017 ^[37]		LBP, MI	Laminectomy	FR
Elsharkawy <i>et al.</i> , 2018 ^[45]	Epidural tumor	LBP, RP, SI	Interlaminar approach	FR
Frioui and Khachnaoui, 2018 ^[41]		LBP, RP, MI, SI, HR, UR	Herniectomy	PR
Hawkins <i>et al.</i> , 2018 ^[43]		MI, SI, HR,	Laminectomy	IM
Kim <i>et al.</i> , 2018 ^[46]	Epidural tumor	LBP, MI, SI, HR	Laminectomy	FR
Montalvo Afonso <i>et al.</i> , 2018 ^[42]	Pseudotumoral	RP, MI, SI, HR	Laminectomy	FR
Montalvo Afonso <i>et al.</i> , 2018 ^[42]		LBP, RP, SI, HR	Durotomy	IM
Montalvo Afonso <i>et al.</i> , 2018 ^[42]		LBP	TLIF L4–S1 and herniectomy	IM
Park <i>et al.</i> , 2018 ^[39]		MI, SI, HR	Laminectomy	FR
Tamburrelli <i>et al.</i> , 2018		LBP, RP, MI, SI	Hemilaminectomy	FR
Tamburrelli <i>et al.</i> , 2018		MI, SI	Laminectomy	FR
Himmiche <i>et al.</i> , 2019 ^[49]		MI, SI, UR	Laminectomy	FR
Hur <i>et al.</i> , 2019 ^[47]		MI, SI	Interlaminar approach endoscopic	FR
Mugge <i>et al.</i> , 2019 ^[48]		MI, SI, HR, UR	Laminectomy and foraminotomy	FR
Mallepally <i>et al.</i> , 2020 ^[52]		LBP, MI, SI	Laminotomy and discectomy	IM
Theodorou <i>et al.</i> , 2022 ^[58]		RP, MI, SI	Laminectomy	FR
Theodorou <i>et al.</i> , 2022 ^[58]		LBP, MI, SI, HR	Laminectomy and discectomy	FR
Theodorou <i>et al.</i> , 2022 ^[58]		MI, SI, HR	2-level laminectomy	FR
Chang <i>et al.</i> , 2024 ^[54]		LBP, RP, MI, SI, HR, UR	Laminectomy	IM
Jain <i>et al.</i> , 2020 ^[51]		LBP, RP, MI, SI	Laminectomy	PR
Passanisi <i>et al.</i> , 2021 ^[53]	Tumor cyst	MI, SI, HR, UR	Hemilaminectomy	IM
Kanbara <i>et al.</i> , 2024 ^[55]		LBP, MI, SI, HR	Laminectomy and fusion	IM
Ayyappan Unnithan, 2022 ^[56]		LBP, MI, SI, HR, UR	Laminectomy	IM
Ayyappan Unnithan, 2022 ^[56]	Intradural tumor	LBP, MI, SI, HR, UR	Laminectomy	IM
Elmi Saad <i>et al.</i> , 2024 ^[57]		LBP, MI, SI	Laminectomy	FR
Case 1	Abscess	LBP, RP, MI, SI, HR, UR	Laminectomy and discectomy	IM
Case 2		MI, SI, HR, UR	Hemilaminectomy	IM
Case 3		RP, SI	Hemilaminectomy	FR
Case 4		LBP, RP, HR, UR	Laminectomy	FR
Case 5	Abscess, tumor	LBP, RP, HR, UR	Laminectomy	FR

LBP: Low back pain, RP: Radicular pain, MI: Motor involvement, SI: Sensitive involvement, HR: Hyporeflexia, UR: Urinary retention, FR: Full recovery, IM: Improvement, PR: Presence of sequelae, NR: None reported, MRI: Magnetic resonance imaging, CT: Computed tomography, M: Male, F: Female, DM: Diabetes mellitus, CKD: Chronic kidney disease, MEP: Motor-evoked potential, PES: Peripheral sensory-nerve electrical stimulation, EMG: Electromyography.