

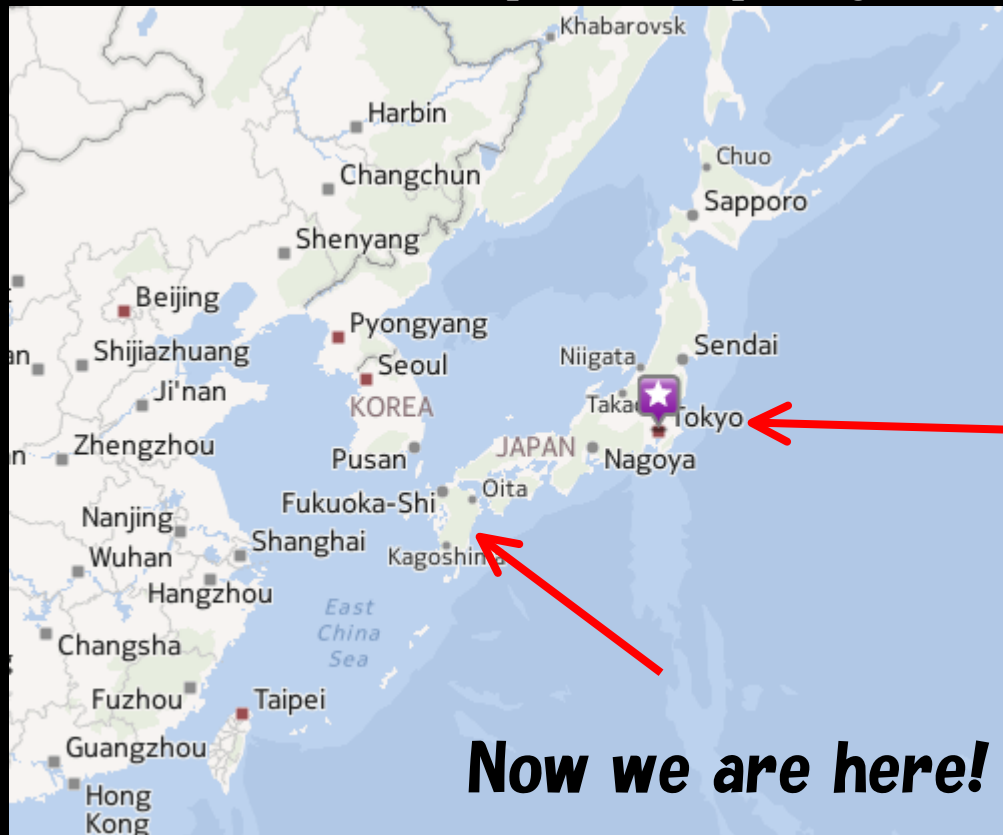


# **Microendoscopic unilateral posterior lumbar interbody fusion (ME-PLIF) with percutaneous pedicle screw fixation and its complications**

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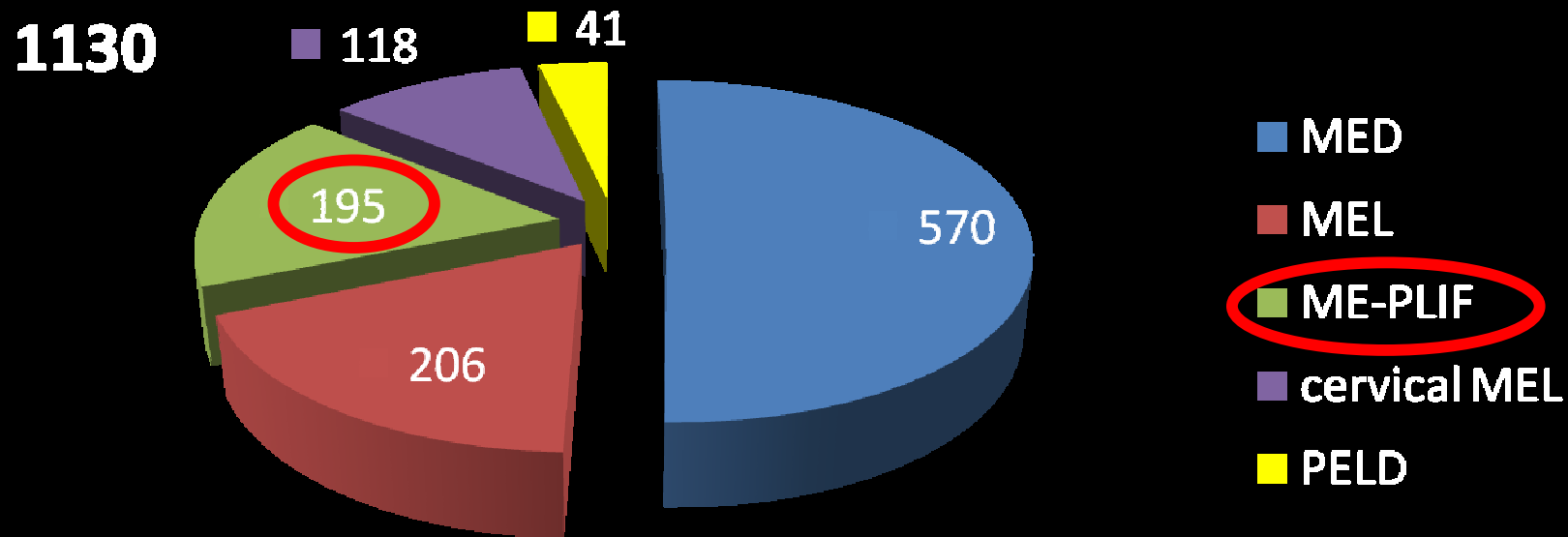
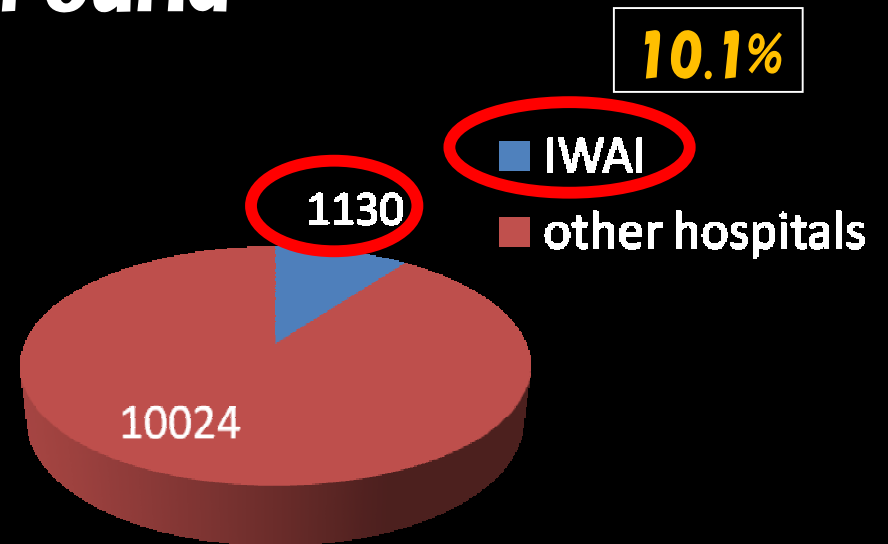
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# Background

In Japan  
11154 microendoscopic spine surgeries  
in 287 hospitals in 2011  
(Hasegawa T. JOA incident report 2012)

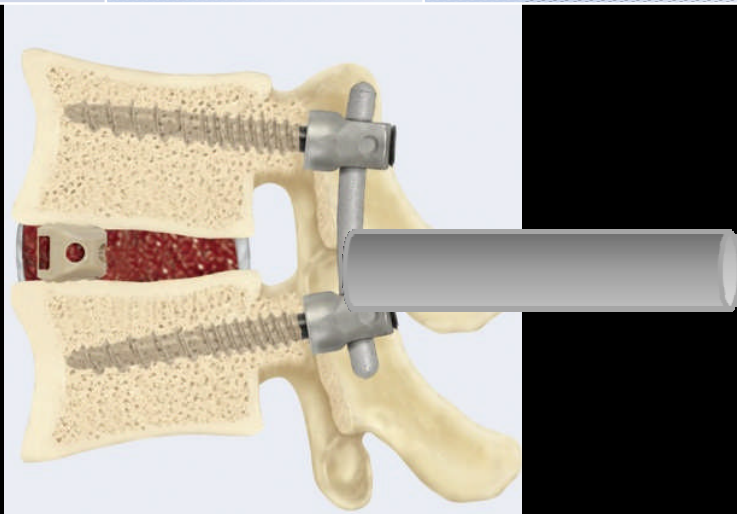


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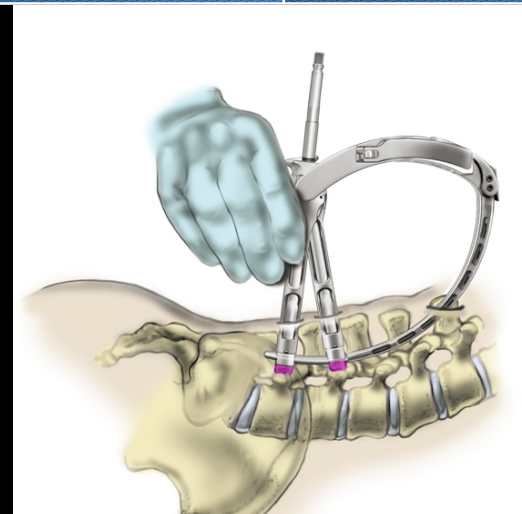
(Takano Y., et al. JSSR 2013)

## Comparison of incident rate in this study with JOA report

	This study (Takano 2013)		JOA report (Hasegawa 2012)	
	Total (n)	Rate (%)	Total (n)	Rate (%)
MED	570	1.9	5762	2.1
MEL	206	6.3	2936	3.9
ME-PLIF	195	8.7	649	3.7
MECD	118	0.8	324	0.93
PELD	41	0	1302	0.31
	1130	3.7	10973	2.39



## PLIF via 18mm Tubular retractore



## Percutaneous pedicle screw (PPS)

# Evaluation chart for incident level

(国立大学病院医療安全管理協議会)

Level		Continuity of injury	Grade of injury	Contents
0	INCIDENT	—	—	エラーや医薬品・医療用具の不具合が見られたが、患者には実施されなかった
1		なし	—	患者への実害はなかった(何らかの影響を与えた可能性は否定できない)
2		Temporary	mild	処置や治療は行わなかった(患者観察の強化、バイタルサインの軽度変化、安全確認のための検査などの必要性は生じた)
3a		Temporary	Moderate	<b>Hospitalization extension (—)</b> の縫合、 疼痛管理が必要など)
3b	ACCIDENT	Temporary	Severe	縫合や加療を要した(バイタルサインの高度変化、 <b>Hospitalization extension (+)</b> 外来患者の入院、骨折など)
4a		Permanent	mild～moderate	永続的な障害や後遺症が残ったが、有意な機能障害や美容上の問題は伴わない
4b		Permanent	Moderate～Severe	永続的な障害や後遺症が残り、有意な機能障害や美容上の問題を伴う
5		Death	—	死亡(原疾患の自然経過によるものを除く)

# Incident rate of ME-PLIF in this study

(Takano Y., et al. JSSR 2013)

	Total (n)	(%)	Incident (n)	Rate (%)	1	2	3a	3b	4
MED	570	50.5	11	1.9		2	8	1	
MEL	206	18.2	13	6.3	1	1	9	2	
ME-PLIF	195	17.3	17	8.7			11	6	
MECD	118	10.4	1	0.8				1	
PELD	41	3.6	0 *	* MED conversion in 3 cases					
	1130	100	42	3.7	1	3	28	10	

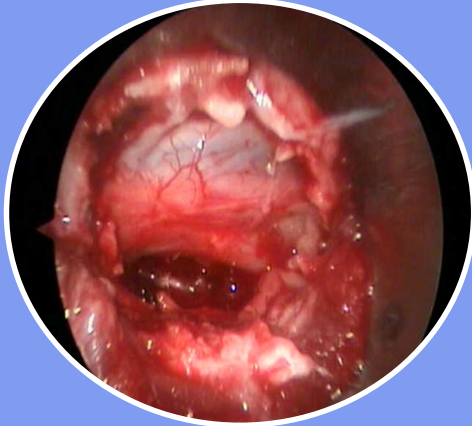
## Aims

- The purposes of this study were to investigate complications of microendoscopic ME-PLIF with PPS and to introduce microendoscopic techniques for complication.



# Materials & Methods

- 195 Pts of ME-PLIF in 2011 (one-level :160 two-level :35)
- ME-PLIF procedure through 18 mm tubular retractor



Total facetectomy  
Neural  
decompression



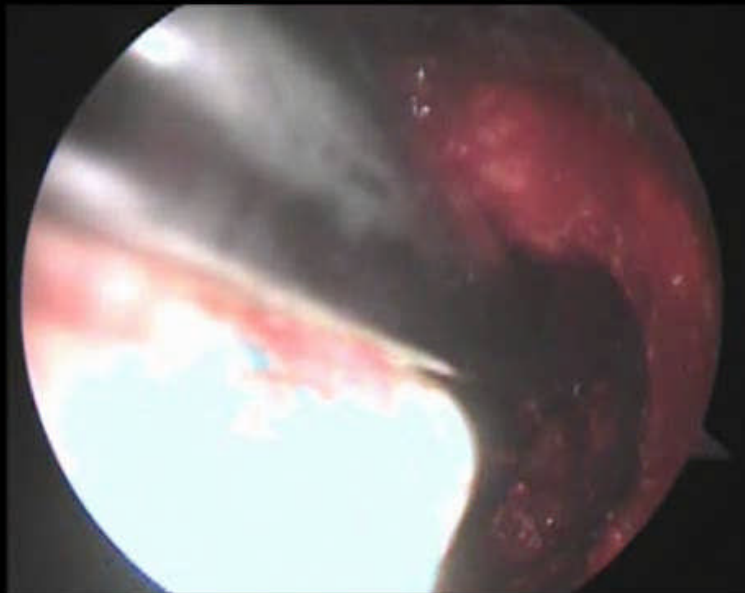
EP preparation  
bone graft  
cage insertion



Percutaneous  
pedicle screw  
fixation (PPS)

# Microendoscopic techniques for C-shape cage insertion

Microendoscopic view



Lateral view



## Typical case

68 y.o. female

Right L4/5 intraforaminal stenosis

L4 degenerative spondylolisthesis

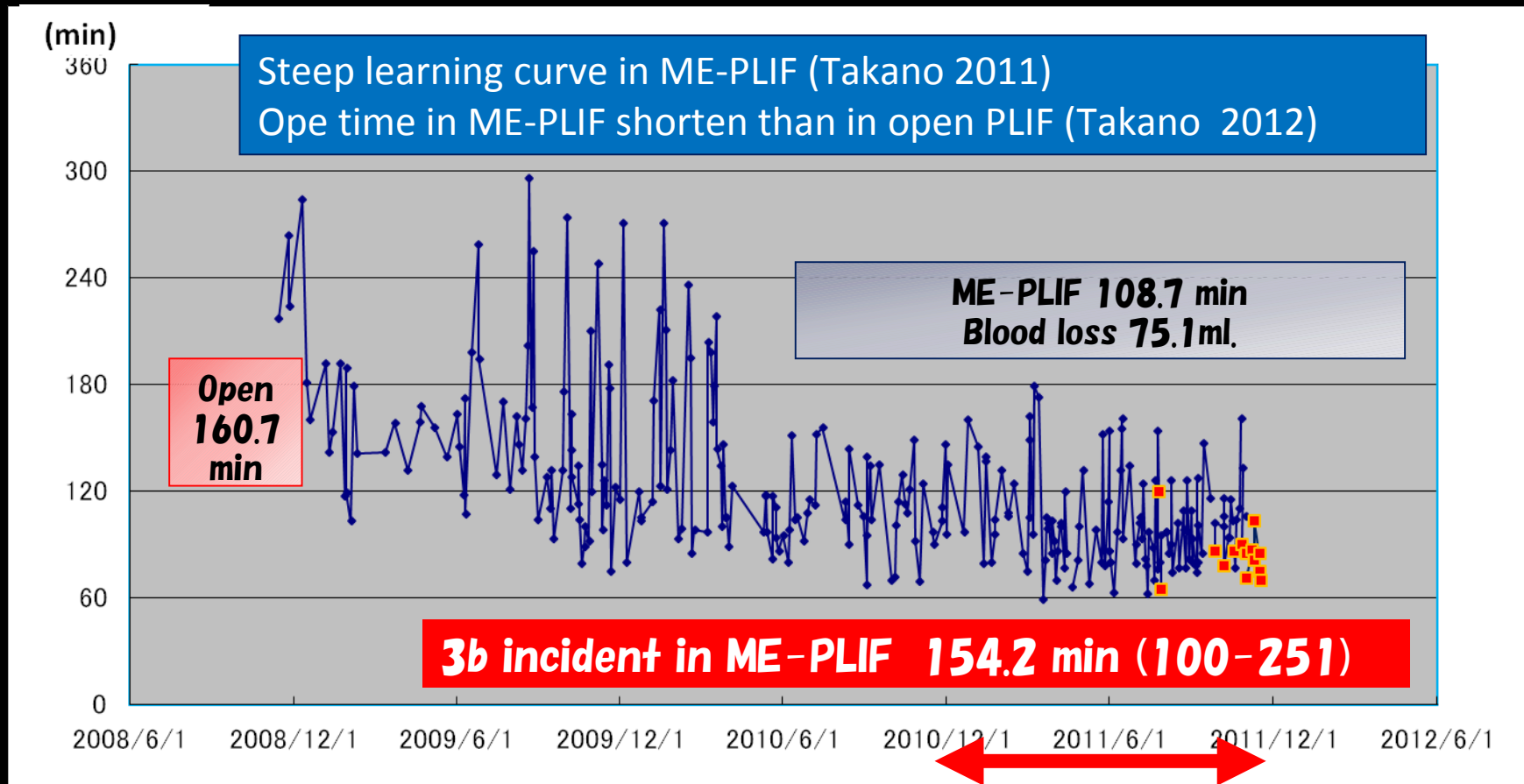
JOA score pre 14 → post 27/29

Excellent





# Complications in ME-PLIF



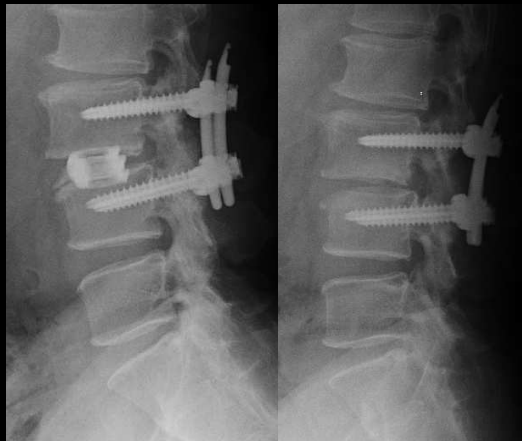
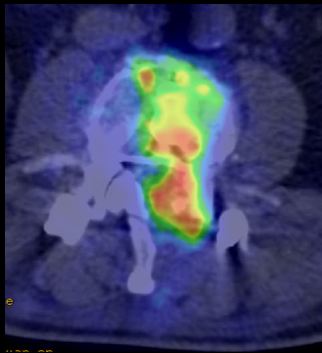
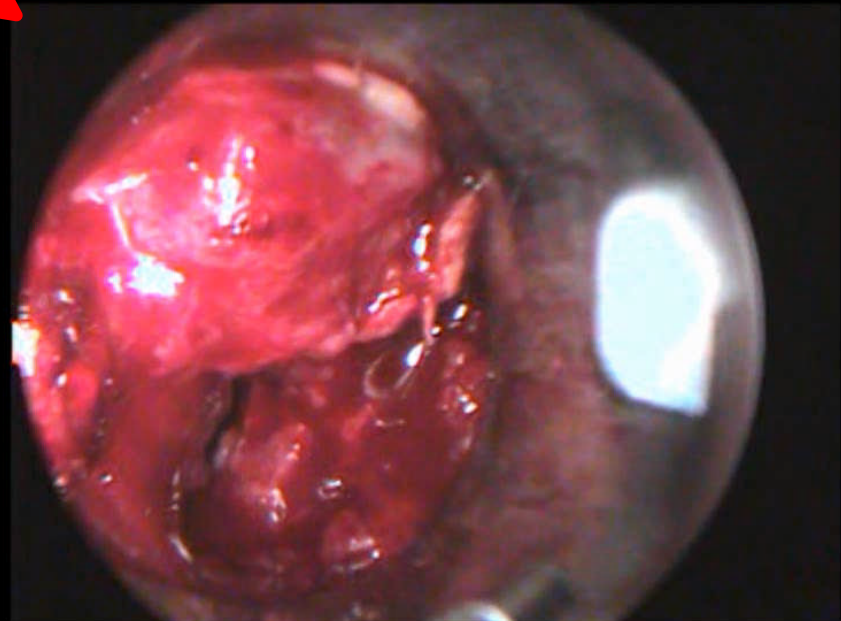
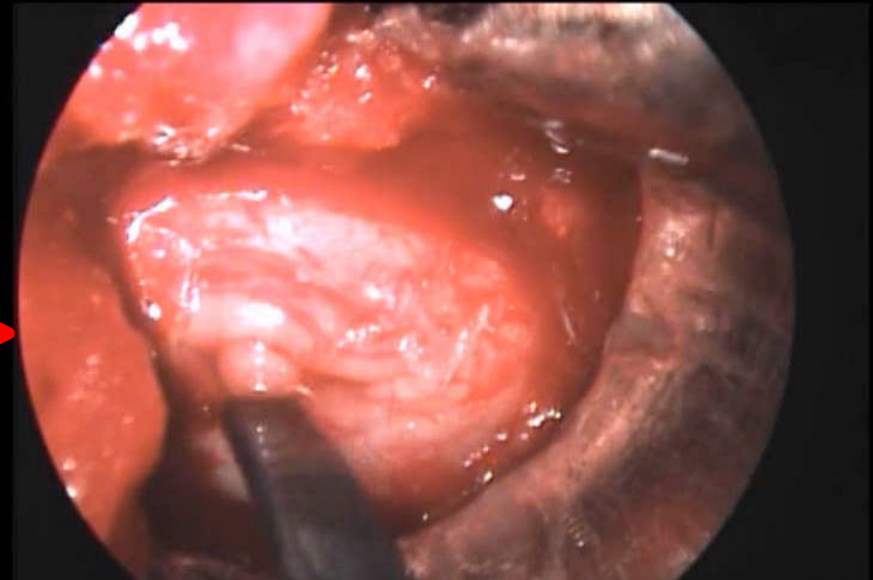
## 3b incidents in ME-PLIF in 2011

dural tears	1/12	infections	3/3
hematoma	1/1	cage deviation	1/1

# 3b level incidents in ME-PLIF

## 3b level incident

- dural tears 1/12  
    ME dural repair
- infections 3/3  
    ME cage removal
- hematoma 1/1  
    ME decompression
- cage deviation 1/1  
    removal via anterior  
    approach



# Surgical site infection in ME-PLIF

Case	Age	Sex	PLIF level	1st hospitalization	Time to detection (day)	WBC	CRP	Past history	Positive culture
1	59	M	L3/4	11	35	9300	4.12	Revision	MRSE
2	86	M	L5/S1	47	19	13350	16.45	DM Revision	CNS
3	78	M	L4/5	8	73	9560	3.27	DM	

	Time to detection of SSI for deep infections		Incident rate (%)		
	Mean (days)	Median (days)	Total (%)	Deep Infection	PLIF
Pull ter Gunne AF (Spine 2010)	<b>29.9</b>	<b>15.0</b>	4.2 % 132/3174	<b>2.6 %</b> 84/3174	- 67/?
In this study	<b>42.3</b>	<b>35.0</b>	0.2% 3/1130	<b>0.2%</b> 3/1130	1.5% 3/195

# Conclusion



- ME-PLIF allows for safe and efficient minimally invasive treatment of lumbar degenerative disorders.
- Most of the complications in ME-PLIF were treated with microendoscopic techniques.
- In ME-PLIF, the rate of 3b level incident was 3.0%. The evitable complications were present.
- The development of a new technique and a new device to prevent surgical site infection is expected in future.