



A Comparison between Repeat Discectomy versus Fusion for the Treatment of Recurrent Lumbar disc herniation: Systematic Review and Meta-analysis.

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Objective

- Primary : compare revision rate between repeat discectomy and fusion
- Secondary : analysis other outcome between repeat discectomy and fusion

Data source & Searching

- PubMed/Medline
- Ovid
- Scopus
- Cochrane database
- Embase

Database	Pubmed, Cochrane and google scholar
strategy	Search term
#1	(relapse OR recurrent OR repeat OR recurrence) AND (lumbar OR Back OR lumbosacral region) AND (disk OR disc) AND (herniation OR prolapse OR protusion)
#2	(Discectomy OR Discectomy OR Simple Discectomy OR Simple Discectomy)
#3	(Fusion OR spinal fusion)
#1 AND #2 AND #3	

Selection

Inclusion criteria

- Comparative study between discectomy and fusion
- Full text available

Exclusion criteria

- Exclusion criteria
 - Criteria diagnosis was not clearly defined or if criteria diagnosis was:
 - Recurrent disc must be confirmed by MRI and re-herniation of the same level in previous surgery.
 - Symptom free interval from the first discectomy for at least 6 months.
 - Follow up time less than 12 months
 - Re-operation details not described in the study
 - Low quality of study
 - Non-human study

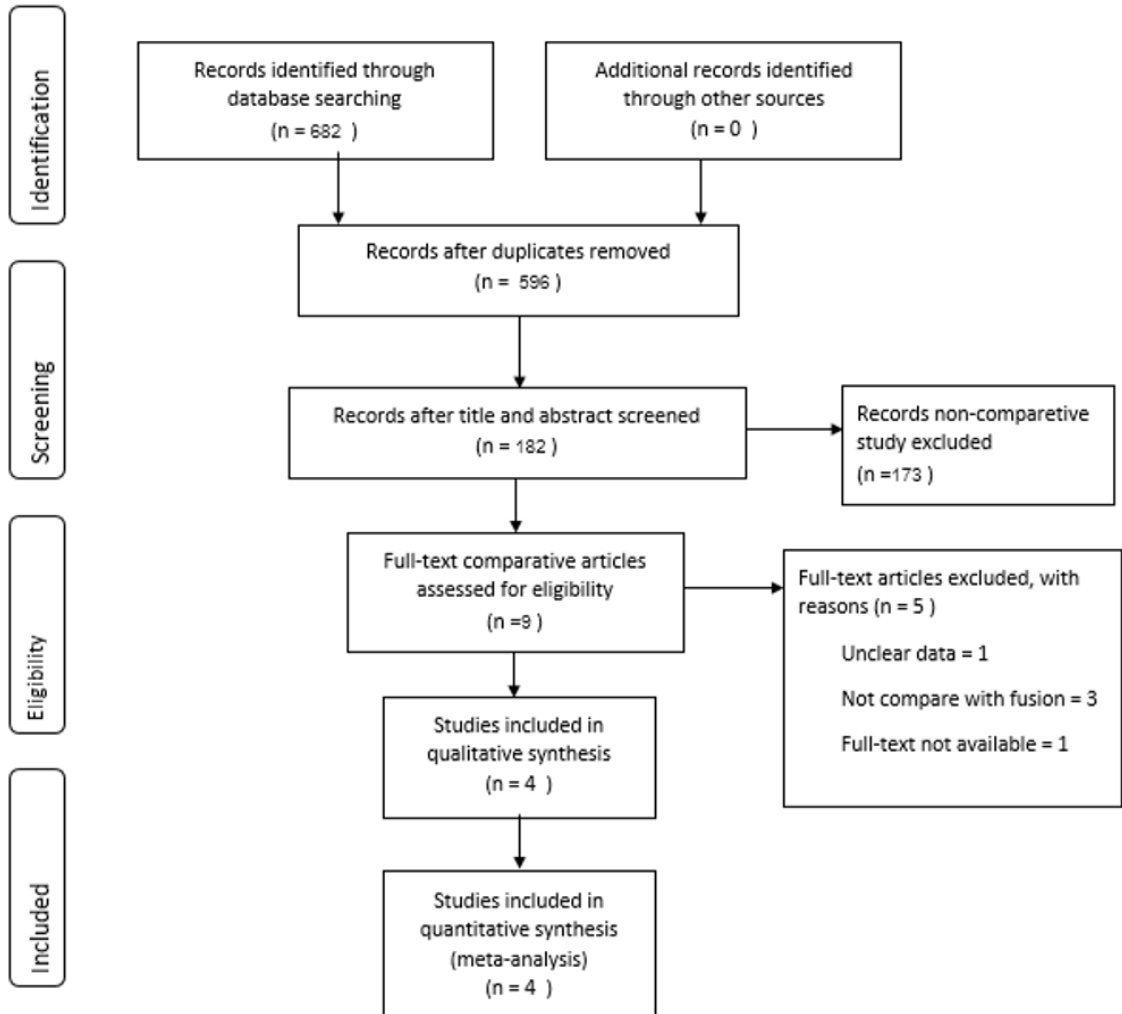
Method

- 2 Reviewer
- Analysis by software : Comprehensive Meta-Analysis version 2

- Comprehensive Meta-analysis (CMA), MetAnalysis, MetaWin, MIX, RevMan, and WEasyMA ,STATA

Ref : Bax L, Yu L-M, Ikeda N, Moons KG. A systematic comparison of software dedicated to meta-analysis of causal studies. *BMC Medical Research Methodology*. 2007;7:40. doi:10.1186/1471-2288-7-40.

Outcome



		Reviewer 1	
		Selected	Not selected
Reviewer 2	Selected	3	0
	Not selected	1	178

Kappa agreement = 0.85

(95% confidence interval: 0.573-1.000)

Quality assessment

- RCT Study
 - The Cochrane Collaboration's tool for assessing risk of bias

- Non-RCT Study
 - Newcastle-Ottawa Scale

Article : Ayman A. El Shazly (2013)

Domain	Review authors' judgement
Sequence generation	high risk of bias
Allocation concealment	high risk of bias
Blinding of participants, personnel	high risk of bias
Incomplete outcome data	low risk for bias
Selective outcome reporting	low risk for bias
Other sources of bias	unclear

Article	categories	quality		comment
Jian guan (2016)	slection	*****	8	high
	comparability	**		
	outcome	**		
ZHUO Xianglong (2009)	slection	*****	7	high
	comparability	*		
	outcome	**		
Tsai-Sheng Fu (2005)	slection	*****	8	high
	comparability	**		
	outcome	**		

Article	duration	study design	sample size	intervention	Demographic (Sex, Age)	pre operative score	Follow-up time
Jian guan (2016)	Nov 2012-May 2015	retrospective study comparative study	37		male 25 female 12	ODI ($\bar{x} \pm SD$)	at least 12 month
				disectomy = 25	51 +/- 12	26.9 \pm 10.5	mean 2.2 \pm 0.75 yrs (1.0-3.4)
				Fusion* = 12	53.4 +/- 15.2	24.8 \pm 9.7	mean 2.2 \pm 0.69 yrs (1.2-3.2)
Ayman A. El Shazly (2013)	Jan 2005-Jan 2010	prospective randomized comparative study	45		male 25 female 20	JOA ($\bar{x} \pm SD$)	range 24-54 months mean 37 \pm 7.85 months.
				disectomy= 15	41 +/- 11.10	16.7 \pm 4.94	
				TLIF = 15	40.5 +/- 9.68	15.7 \pm 5.39	
				PLF = 15	42.7 +/- 10.4	16.7 \pm 5.18	
ZHUO Xianglong (2009)	Jan 2000-Jan 2008	retrospective study comparative study	65		male 44 female 21	ODI ($\bar{x} \pm SD$)	range 12-36 month mean 20 month
				disectomy 25	39.5 (30-64)	54.4 +/- 5.5	
				PLIF = 22	41 (26-65)	53.5 +/- 4.9	
				TLIF = 18	43 (30-65)	55.1 +/- 5.6	
Tsai-Sheng Fu (2005)	Apr 1992-Sep 1998	retrospective study comparative study	41		male 30 female 11	JOA ($\bar{x} \pm SD$)	minimum 60 month
				disectomy = 23	41.1 +/- 13.4	9.5 +/- 3.7	mean 85.6 mo
				PLF = 18	42.2 +/- 9.3	8.7 +/- 2.6	mean 92.6 mo

*size : TLIF = 7 , MIS TLIF = 3 , PLIF = 2

Article	intervention (n)	reoperative rate	operative time (min) $\bar{x} \pm SD$	dura tear	post op stay(day) $\bar{x} \pm SD$
Jian guan (2016)	disectomy = 25	3	82.7 ±29.1	2	1.0 ±0.3
	Fusion* = 12	0	229.6 ±42.1	2	3.7 ± 0.9
			P<0.001		P<0.001
Ayman A. El Shazly (2013)	disectomy= 15	2	125.3 ±25.32	4	3.4 ±0.74
	TLIF =15	0	194 ±25.58	2	3.5 ±1.13
	PLF =15	0	186 ±16.82	1	3.3 ± 1.05
			P<0.05		P=0.852
ZHUO Xianglong (2009)	disectomy 25	3	95±25	3	8 ±2.1
	PLIF =22	0	150 ±33	3	10 ±3
	TLIF =18	0	105 ±18	1	9 ±1.5
			P<0.05		P>0.05
Tsai-Sheng Fu (2005)					
	disectomy =23	1	100.9 ±22.8	3	4.7 ±1.4
	PLF = 18	2	166.3 ±26.7	2	6.2 ±1.1
			P<0.05		P<0.05

Total N
Disectomy 88
Fusion 100

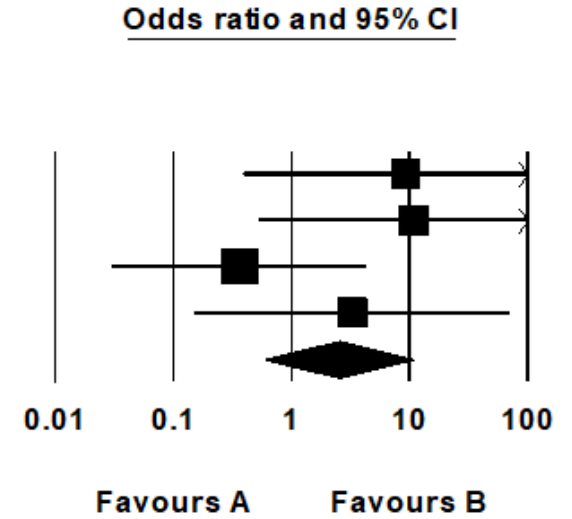
10% vs 2%

10% vs 2%

Article	intervention (n)	total mean JOA	recovery rate (%)	mean ODI	improvement rate (%) $\bar{x} \pm SD$	satisfactory rate (%)	blood loss (ml) $\bar{x} \pm SD$	Cost (dollar) $\bar{x} \pm SD$
Jian guan (2016)	disectomy = 25			11.6 ±8.2				11,567.05 ±2,937.44
	Fusion* = 12			15.6 ±9.5				54,458.29 ± 6,1060.29
				P=0.222				P<0.001
Ayman A. El Shazly (2013)	disectomy= 15	26.1 ±6.54	82.8 ±31.15			86.7	256.7 ±67.13	1,520 ±36.84
	TLIF =15	27.9 ±0.74	90.1 ±7.73			93.3	653.3 ±183.68	2,776.7 ±56.27
	PLF =15	27.9 ±0.80	88.8 ±10.18			86.7	660 ±164.97	2,186.7 ±52.33
		P=0.327	P=0.554			P=0.968	P<0.05	P<0.05
ZHUO Xianglong (2009)	disectomy 25			11.9 ±2.7	76.4 ±8.3	84	300 ±45.4	
	PLIF =22			12 ±2.5	75.5 ±7.2	88.9	600 ±125.7	
	TLIF =18			11.7 ±1.8	78.1 ±7.7	81.8	330 ±75.2	
				P>0.05	P>0.05	P>0.05	P<0.05	
Tsai-Sheng Fu (2005)								
	disectomy =23	25.3 +/-4.7	81.4 ±20.8			78.3	162.7 +/- 106.8	
	PLF = 18	25.6 +/-4.7	83.2 ±22.8			83.3	546.7 +/- 206.1	
		P=0.837	P=0.799				P<0.05	

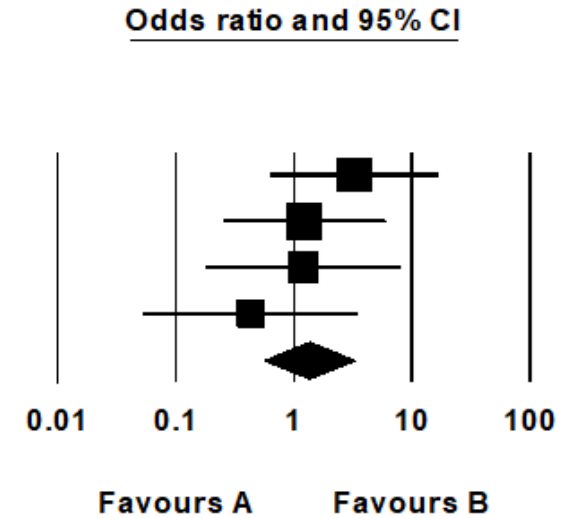
Revision case

<u>Study name</u>	<u>Statistics for each study</u>				
	Odds ratio	Lower limit	Upper limit	Z-Value	p-Value
Ayman A. El Shazly	9.231	0.389	219.010	1.376	0.169
ZHUO Xianglong	10.909	0.522	227.774	1.541	0.123
Tsai-Sheng Fu	0.364	0.030	4.366	-0.798	0.425
Jian guan	3.273	0.151	70.883	0.756	0.450
	2.533	0.594	10.797	1.256	0.209



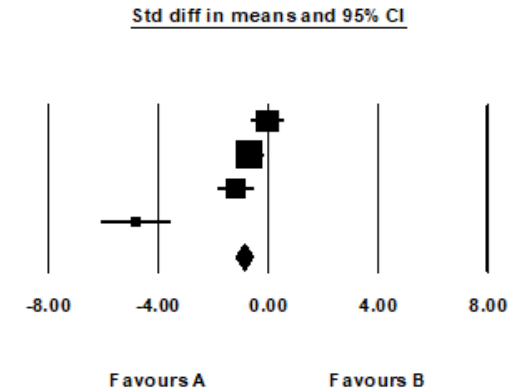
Dura tear case

<u>Study name</u>	<u>Statistics for each study</u>				
	Odds ratio	Lower limit	Upper limit	Z-Value	p-Value
Ayman A. El Shazly	3.273	0.627	17.092	1.406	0.160
ZHUO Xianglong	1.227	0.251	6.007	0.253	0.800
Tsai-Sheng Fu	1.200	0.178	8.073	0.187	0.851
Jian guan	0.435	0.053	3.536	-0.779	0.436
	1.346	0.553	3.274	0.655	0.513



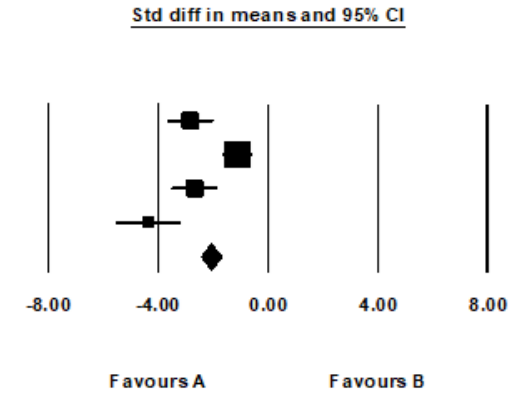
Post op stay

Study name	Statistics for each study						
	Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
Ayman A. El Shazly	0.000	0.316	0.100	-0.620	0.620	0.000	1.000
ZHUO Xianglong	-0.664	0.262	0.068	-1.177	-0.152	-2.540	0.011
Tsai-Sheng Fu	-1.174	0.340	0.116	-1.841	-0.507	-3.449	0.001
Jian guan	-4.801	0.659	0.435	-6.093	-3.509	-7.281	0.000
	-0.869	0.168	0.028	-1.197	-0.540	-5.180	0.000



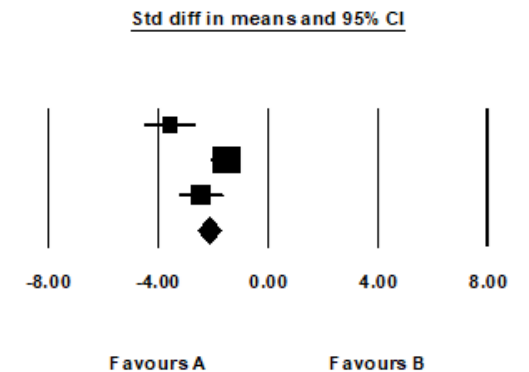
Operative time

Study name	Statistics for each study						
	Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
Ayman A. El Shazly	-2.824	0.434	0.189	-3.675	-1.972	-6.502	0.000
ZHUO Xianglong	-1.095	0.272	0.074	-1.629	-0.561	-4.020	0.000
Tsai-Sheng Fu	-2.661	0.431	0.185	-3.505	-1.817	-6.180	0.000
Jian guan	-4.355	0.616	0.380	-5.563	-3.148	-7.068	0.000
	-2.073	0.193	0.037	-2.451	-1.694	-10.730	0.000



Blood loss

Study name	Statistics for each study						
	Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
Ayman A. El Shazly	-3.561	0.491	0.241	-4.523	-2.599	-7.255	0.000
ZHUO Xianglong	-1.521	0.288	0.083	-2.085	-0.957	-5.287	0.000
Tsai-Sheng Fu	-2.431	0.414	0.171	-3.242	-1.620	-5.877	0.000
	-2.146	0.213	0.045	-2.563	-1.729	-10.081	0.000



Disclosure

- All authors have nothing to disclose
- The manuscript submitted does not contain information about medical device(s)/drug(s).
- No funds were received in support of this work.
- No relevant financial activities outside the submitted work.