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Functional Outcome of Microscopic Lumbar Discectomy for the Treatment of Lumbar Disc Prolapse

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Abstract

Background: The majority of cases of back pain and sciatica may be traced back to a lumbar disc herniation (LDH). There has been a rise in the number of individuals diagnosed with LDH across all age groups.

Aim of Study: The purpose of the research is to assess the surgical outcome of microscopic lumbar discectomy in selected patients with herniated lumbar disc in Neurosurgery Department at Banha University Hospitals.

Patients and Methods: This prospective clinical trial involved 30 individuals of middle aged population who were presented with clinical symptoms of low back pain and radiculopathy due to lumbar disc prolapse who failed sufficient conservative treatment and were subjected for surgery. All cases underwent microdiscectomy at Banha University Hospitals through the period from January 2022 to June 2023. All patients had a preoperative L.S.S MRI at least four months before surgery. All patients had preoperative L.S.S X-ray A-P, lateral, lateral dynamic views and oblique views.

Results: Hospital stay and surgery time were short. Significance improvement occurred in VAS and ODI; VAS enhanced from 7.67±1.06 to 1.47±0.78 (p<0.001), and ODI enhanced from 73.37±7.8 to 10.10±3.8 (p<0.001). Also patient generally returned early to their usual activities. Complications were minimal including one case of csf leak (3.3%), one case of dural tear (3.3%), two cases of infection (6.7%) and 2 cases had intra-operative bleeding <300cc and had drains (6.7%).

Conclusion: Microscopic lumbar discectomy in middle aged population is a safe & effective for cases with symptomatic lumbar disc prolapse who failed proper non-surgical treatment. It offered short surgical time, short hospital stay, less complication, and excellent results, with early return to usual activities.

Key Words: *Microscopic lumbar discectomy – Discectomy – Sciatica – Lower back pain.*

Introduction

ONE of the most frequent reasons for both back pain and sciatica is a lumbar disc herniation (LDH). The prevalence of LDH is rising across all age groups, involving children. Seventy to eighty-five percent of the population will have lower back pain, often accompanied by leg discomfort, at some point in their life **[1]**.

The prevalence of lumbar disc herniation is highest in persons aged 24 to 45, with the incidence leading to surgery happening most frequently in those aged 30 to 39. Surgery for sciatica is performed in between two and ten percent of these individuals **[2]**.

Disc herniation occurs mainly between the fourth and fifth decades of life (mean age of 37 years), although it has been described in all age groups. It has been estimated that 2 to 3% of the population may be affected, with prevalence of 4.8% among men over 35 years of age and 2.5% among women over this age **[3]**.

Initial low back pain, which may progress to lumbar sciatica (often after one week) and may ultimately continue as pure sciatica is the typical clinical picture of disc herniation. Due to the wide variety of acute and chronic manifestations, it is important to keep an eye out for unusual symptoms and be prepared to do a differential diagnosis **[3]**.

There has been no reported difference in clinical outcomes or complications among individuals requiring an inpatient stay and those who can have lumbar microdiscectomy as a day-case treatment, suggesting that this is a feasible and safe option **[4]**.

Although open discectomies seem to be the option of choice for LDH surgery, it appears to be a safe procedure with few operative complications in the younger population. With a 1% complication rate, our research shows that lumbar microdiscectomy is likewise safe. Our study's low complication rate may be due, in part, to the young age of the

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patients included and the exclusion of people who had previously undergone surgery on their lumbar spine **[5]**.

Aim of the work:

The objective of the research is to assess the surgical outcome of microscopic lumbar discectomy in selected patients with herniated lumbar disc in Neurosurgery Department at Banha University Hospitals.

Material and Methods

This prospective clinicalresearch was performed on 30 individuals of middle aged population who were presented with clinical symptoms of low back pain and radiculopathy due to lumbar disc prolapse who failed sufficient conservative treatment and were subjected for surgery. All patients underwent microdiscectomy at Banha University Hospitals through the period from January 2022 to June 2023.

Thirty patients 17 male, 13 female in middle age population with the age ranged from 21-42y, mean age (33.10±5.66) years old.

All patients were assessed carefully, their history was taken and their complaints were analyzed. Also past history of chronic disease was taken to assess co morbidity and fitness for surgery.

All cases had a preoperative L.S.S MRI at least four months before surgery. All subjects had preoperative L.S.S X-ray A-P, lateral, lateral dynamic views and oblique views.

After surgery all patients were ordered for early ambulation usually after 6h from surgery, no special recommendations for getting up and to the bed and also patients can sit during eating and in bathroom, butusually avoided to sit a rather than to situations except for short periods less than 15min. and this was only in the first week then patients can change positionand start activity according to their preference and tolerance to any post-operative pain.

The medical information was documented employing a report form. Microsoft Excel 2016 and SPSS (Statistical Package for the Social Sciences) 26.0 were employed to compile and analyze these numbers.

Results

Participants in our research varied in age from 21 to 42 years old, with a mean age of 33.10 ±5.66. There were seventeen males (56.7%) and 13 females (43.3%), with a male to female ratio of 1.31:1.

Table (1): Demographic characteristics of the studied patients.

Parameters	Studied patients (N=30)	
	N	%
Gender:		
Male	17	56.7
Female	13	43.3
Age (years):		
Mean ± SD	33.10±5.66	
Median	34.5	
Range	21-42.0	

This table illustrates demographic characteristics of the studied patients. The age of patients ranged from 21 to 42 years with mean age ±SD was 33.98± 13.49 years. There were 17 (56.7%) males and 13 (43.3%) were females with male to female ratio was 1.31:1.

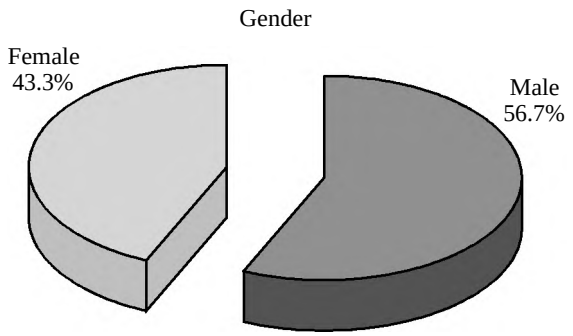

Fig. (1): Gender distribution in the studied cases.

All cases complained from sciatica, 60% of cases had sciatica on the left side, 33.3% of them in right side while 6.7% of cases had sciatica in both sides. Back pain was reported in 25 (83.3%) cases. None of cases had claudication. The mean VAS score was 7.67± 1.06 and ranged from 6 to 9.

This table shows distribution of studied patients regarding clinical presentation. All cases complained from sciatica, 60% of cases had sciatica on the left side, 33.3% of them in right side while 6.7% of cases had sciatica in both sides. Back pain was reported in 25 (83.3%) cases. None of cases had claudication. The mean VAS score was 7.67 ± 1.06 and ranged from 6 to 9.

In our research group, the most prevalent degree of disc herniation was at L5/S1, with 53.3% of the subjects having intervertebral disc prolapse at L5/S1, 43.3% having intervertebral disc prolapse at L4/L5, and 3.3% having intervertebral disc herniation at L4/L5 & L5/S 1.

Table (2): Distribution of studied patients regarding clinical presentation.

Clinical presentation	Studied patients (N=30)	
	N	%
Back pain:		
Negative	5	16.7
Positive	25	83.3
Back pain (VAS):		
Mean ± SD	7.67±1.06	
Median	8.0	
Range	6.0-9.0	
Claudication:		
Negative	30	100.0
Positive	0	0.0
Sciatica:		
Negative	0	0.0
Positive (right)	10	33.3
Positive (left)	18	60.0
Positive (bilateral)	2	6.7
Sciatica (VAS):		
Mean ± SD	7.67±1.06	
Median	8.0	
Range	6.0-9.0	

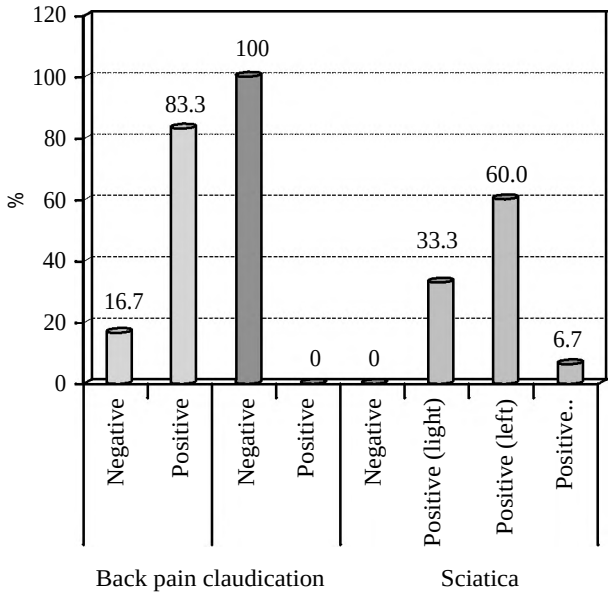

Fig. (2): Distribution of studied cases regarding clinical presentation.

Table (3): Distribution of studied patients regarding level of injury.

	Studied patients (N=30)	
	N	%
Level of injury:		
L4-5	13	43.3
L4-5 & L5-S 1	1	3.3
L5-S1	16	53.3

This table shows distribution of studied patients regarding level of injury. More than half cases (53.3%) had injury at L5-S 1 level, 13 (43.3%) cases had injury at L4-5 level while one case had injury in both L4-5 & L5-S 1 levels.

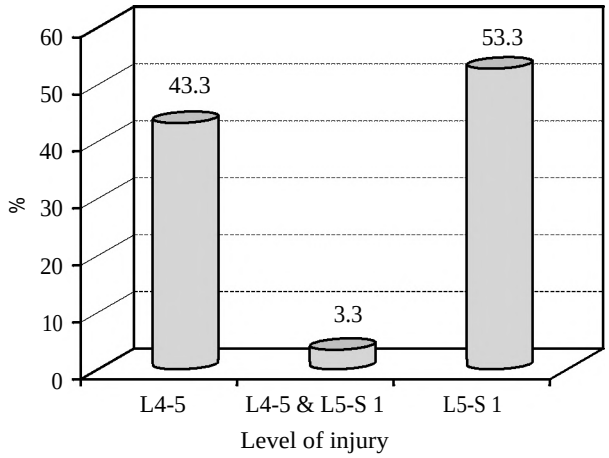

Fig. (3): Distribution of studied cases regarding level of injury.

The average length of hospitalization in our sample was 1.16 days (1-3 days). There was a one-day hospital stay for 86.7% of the participants and a two-day hospital stay for 10%. 3.3% of the participants were hospitalized for three days as shown in Table (4).

Table (4): Hospital stay after surgery in days.

	Studied patients (N=30)	
	N	%
Hospital stay:		
1 day	26	86.7
2 days	3	10
3 days	1	3.3

The mean duration of return of patients to work was 4.27 weeks (ranged from 3 to 6 weeks). 30% of patients returned to work after 3 weeks, 30% after 4 weeks, 23.3% after 5 weeks and 16.7% of patients returned to work after 6 weeks as shown in Table (5).

Table (5): Return of patients to work in weeks.

	Studied patients (N=30)	
	N	%
Return to work:		
3 weeks	9	30
4 weeks	9	30
5 weeks	7	23.3
6 weeks	5	16.7

The mean ODI preoperative which was 73.37 ± 7.8 (56 to 84) had gone down to 10.10±3. 8 (5 to 19). According to the ODI scoring method, scores ranging from 0% to 20% indicate a mild impairment. As a consequence, our research produced great results, for individuals scoring below twenty percent. The mean VAS pre-operative was 7.67 ± 1.06 (6 to 9) had gone down to 1.47 ±0.78 (1 to 4) post-operative.

Table (6): Distribution of studied patients regarding intraoperative and postoperative complications.

	Studied patients (N=30)	
	N	%
Dural tear:		
Negative	29	96.7
Positive	1	3.3
CSF leak:		
Negative	29	96.7
Positive	1	3.3
Intra-operative Hemorrhage more than 300 cc:		
Negative	28	93.3
Positive	2	6.7
Infection:		
Negative	28	93.3
Positive	2	6.7

This table shows distribution of studied patients regarding intraoperative and postoperative complications. Dural tear was observed in one case, CSF leak was observed in one case, hemorrhage was reported in two cases and infection was reported in two cases.

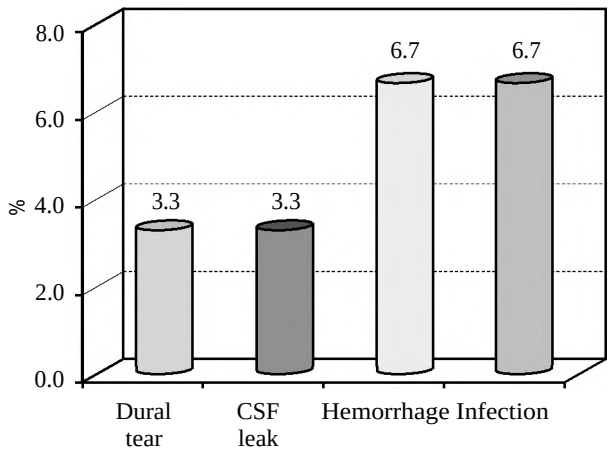

Fig. (4): Distribution of studied cases regarding intraoperative and postoperative complications.

Conclusion

Herniation of nucleus pulposus causes radiculopathy that is produced by combination of mechanical, inflammatory & chemical changes.

Sciatica is often the symptom lumbar disc disease and patient may complain of parasthesia, numbness, bladder disturbances & weakness.

Hospital stay and surgery time were short. Significance improvement occurred in VAS and ODI; VAS improved from 7.67 ± 1.06 to 1.47±0.78 (p<0.001), and ODI improved from 73.37 ±7.8 to 10.10±3.8 (p<0.001). Also patient generally returned early to their usual activities. Complications were minimal include one case of CSF leak (3.3%), one case of dural tear (3.3%), two cases of infection (6.7%) and 2 cases had intra-operative bleeding <300cc and had drains (6.7%).

Lumbar microdiscectomy surgery is a good and effective option for patients with symptomatic lumbar disc prolapsed who failed proper medical and non-medical treatment.

Lumbar microdiscectomy can offer excellent pain releif regarding low back pain and sciatica and can offer shorter hospital stay, shorter surgery time, less operativebleeding, less postoperative complication, rapid recovery, and early return to usual activities and work.

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النتائج الوظيفة لاستئصال الغضروف القطنى المنزلق بالميكروسكوب فى علاج مرضى

تعد آلام أسفل الظهر وآلام عرق النسا من أكثر آلالام انتشاراً على مستوى العالم ومع تقدم وسائل التشخيص المساعدة بعد الفحص الإكلينيكى مثل الرنين المغناطيسى والتى يستطيع بها الطبيب تقييم مدى الضغط على جذور الأعصاب عند خروجها من القناة العصبية الشوكية ويساعد الجراح على اتخاذ القرار الجراحى المناسب وطريقة العلاج المناسب من علاج تحفظى أو جراحى تقليدى أو محدود التدخل الجراحى. وقد تم دخول تقنيات حديثة لإستئصال الغضروف القطنى مثل الليزر أو الكى الكهربائى أو المنظار الضوئى أو الميكروسكوب الجراحى وذلك لتقليل حجم المضاعفات الناتجة عن الجراحة والوصول لنتائج أفضل ونعرض فى هذه الرسالة وهى النتائج الوظيفية لإستئصال الانزلاق الغضروفى القطنى المنزلق بالميكروسكوب فى علاج مرضى الانزلاق الغضروفى القطنى والتى تم اجراؤها لـ ٣٠ مريضاً تتراوح أعمارهم بين ٢١ إلى ٤٢ سنة و منهم ١٧ ذكراً و ١٣ أنثى بعد ما فشلت معهم جميع وسائل العلاج التحفظى لفترة كافية والفحص الكامل للمرضى وإجراء جميع الفحوصات والأشعة اللازمة قبل الجراحة وقد تم عمل جميع العمليات بطريقة آمنة بإجراء جرح قطنى صغير واستئصال الغضروف القطنى باستخدام الميكروسكوب الجراحى ولم يتم نقل دم للمرضى وتم السماح للمرضى بالحركة بعد إجراء الجراحة بدون قيود وخروجهم من المستشفى فى نفس يوم الجراحة أو بعد يومين على الأكثر. وهذه الجراحة كغيرها من جراحات العمود الفقرى تحمل بعض المضاعفات الجراحية وأن كانت قليلة فى هذه الدراسة مثل حد وث تسرب السائل المخى من خلال الجرح بنسبة ٣.٣٪ وقطع فى كيس الأعصاب بنسبة ٣.٣٪ والتهابات بالجرح بنسبة ٦.٧٪ وحدوث نزيف أثناء الجراحة أكثر من ٣٠٠ مليلتر وتركيب درنقة خارجية بنسبة ٦.٧٪ من مزايا الجراحة الميكروسكوبية محدودة التدخل الجراحى استخدام جرح قطنى صغير، فقد بسيط للدم وعظيمات الفقرة، استخدام الميكروسكوب يقلل نسبة حدوث ضرر بالجذور العصبية أو القناة الشو كية، تقليل فترة المكوث بالمستشفى، العودة السريعة للعمل.