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Return to Work Following Lumbar Micro discectomy

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Abstract

Background: Return to work following lumbar micro discectomy has a great influence on the financial burden experienced by society because of the lumbar spine pathology. Likewise, it has been proposed as a predictor of the success of lumbar microdiscectomy.

Objective: We analyse the epidemiological characteristics of the patients who had undergone a microdiscectomy and several factors involved on their return to work: the economic factor studied as the patient's healthcare card code, the job type, and the surgeon's experience.

Methods: A prospective study of 30 occupationally active patients who had undergone lumbar microdiscectomies during the second semester of 2016.

Results: The 30% of the patients returned to their previous jobs within 3 months, the 46.7% within 6 months and the 67% within a year after surgery. Only the 6.7% of the high physical load workers and the 9.1% of the patients who presented preoperative claudication returned before 3 months. The 88.9% of the ones who did not return before 3 months have had symptoms for more than one year. Patients who had been operated on by surgeons with less than 10 years of experience have had 4.3 times greater risk of non-return to work one year after the surgery. There was no significant correlation between the patient's healthcare card code (as an economic indicator) and the return to work.

Conclusion: There is less reincorporation to work among patients with high physical load jobs, preoperative claudication, long duration of preoperative symptoms and patients who had been operated on by surgeons with less than 10 years of experience.

Keywords: Discectomy; Lumbosacral region; Return to work; Economics

Abbreviations: PHCC: Patient Health Care Card Codes;
BMI: Body Mass Index.

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Introduction

Lumbar pain affects 80% of the global population through their lifetime, leading to a loss of labour productivity, with the main cause being lumbar disc herniation. Intervertebral discs play a main role in the stability, durability, and flexibility of the spine by absorbing and transferring mechanical stress. A herniated intervertebral disc is the result of the herniation of the nucleus pulposus through the surrounding annulus fibrosis. This is more frequently produced in the lumbar spine; in fact, between 90% and 97% of cases occur at the L4–L5 and L5–S1 levels [1-5].

The main symptoms of this pathology are lumbar pain and irradiated pain through sciatic nerve territory with or without neurological deficit [6,7]. Nevertheless, the impacts of this health problem in affected patients present in the physical sphere but also in the psychological one as well, as patients may develop anxious or depressive episodes [8].

Most patients with lumbar herniated disc respond to conservative treatment [2], but 5% to 20% of cases will require surgical treatment to address the symptoms. Open discectomy is considered the gold standard in surgical treatment in this regard, even though it is associated with a high risk of segmental instability. On the other hand, microdiscectomy [9-11] allows for better surgical field visibility and a smaller surgical incision. It also minimises iatrogenic lesions of the paraspinal muscles and posterior osteoligamentous structures. Therefore, it is a contributing factor to better segmental stability, early relief of symptoms, and shortened hospital stay [10], helping patients to more quickly return to work and resume everyday activities.

There is no consensus regarding what the best variable is for evaluating the success of the surgical treatment. However, lumbar pain and functional capacity after surgery are currently established as principal ones to take into consideration [9]. Successful microdiscectomy rates range from 46% to 75% at six to eight weeks and from 78% to 95% at one or two years after surgery. Between 3% and 12% of patients must undergo further surgery [12].

According to the Clinical Standards Advisory Group, the return to work is one of the most important parameters to evaluate low-back pain–associated disability. Several studies have shown that between 56% and 80% of patients return to work after a microdiscectomy surgery [13], with 70% of them doing so within the first year [1]. However, a return to work not only relies on the resolution of clinical symptoms; it is also influenced as well by psychosocial and labour factors, such as satisfaction or the capability of handling physical loads [9]. Other studies have shown that financial compensation due to the incapacity present after lumbar disc surgery is associated with worse functional capacity results or quality of life after surgery [14]. Likewise, patients with higher incomes try to return to work earlier, as there is a wider difference between their salary and their financial compensation due to incapacity [9].

Return to work plays a part in the economic burden that lumbar pathology represents in society [15]. Likewise, it has been used in many other studies as a prognostic factor following lumbar microdiscectomy. Rushton, et al. [1] reviewed the success of this surgery in the context of return to work time. Separately, Kohlboeck, et al. [13] considered return to work as a prognostic factor in their search for predicting factors of the success of this surgery. To date, the relationship between economic factors and return to work after microdiscectomy is under-researched [14]. If this relationship is confirmed, it would dictate the utility of returning to work as a surgery success indicator. In this regard, it has been used as an economic marker in the study of the patient health care card codes (PHCC) [16]. These data can be accessed through electronic medical histories (Annex I) [14].

The objectives of this study were as follows:

1. Analyse the influence of economic factors, measured with PHCC, on return to work after microdiscetomy surgery in patients suffering from a lumbar disc pathology
2. Evaluate the influence of type of work, according to physical load
3. Study patients' epidemiological characteristics
4. Establish other prognostic factors involved in this surgery

Materials and methods

The present study was conducted at the Neurosurgery Department of the University Central Hospital of Asturias (HUCA). It used as an incidence criterion the number of herniated discs operated on in our department, which covers a population of 220.000 habitants for spine pathology. The incidence of a surgical herniated disc is around 0.02%. We found that a sample size of 30 patients was necessary if we want to study this pathology with a precision of ± 5% and α error of 5%. We conducted a retrospective study of 30 active worker patients who had undergone microdiscectomy surgery for a lumbar disc herniation between 1 June 2016 and 31 December 2016.

Patients who were included were those suffering from only lumbar disc herniation who were actively working and older than 18 years of age. The following variables were registered: sex, age, regular physical exercise, obesity [body mass index (BMI) > 30 kg/m^2], medical history of cardiac symptoms, psychiatric or rheumatic episodes, lesion location, time of symptomatology until surgery, signs and symptoms before and after surgery, responsible surgeon, surgical complications, type of work according to physical load, PHCC code, and number of months until return to work after surgery.

Data analysis was made using the Statistical Package for the Social Sciences version 18 software program (IBM Corp., Armonk, NY, USA). To study quantitative variables, the sample size, mean, standard deviation, and minimum and maximum values were measured. The distribution of qualitative variables was determined by frequency tables. To compare the distribution of different variables between groups, the chi-squared test was used. Fisher's exact test was used for every frequency measured that was less than 5. It was established that a p value of less than 0.05 was statistically significant. Odds ratio was used as a measure of association, a good risk indicator of relative risk on small samples [17].

Results and Discussion

The patients' average age was 49.3 years old (range: 33–68 years), with 18 being male (60%) and 12 being female (40%). According to participant medical histories, 10 were obese (33.3%), 10 had cardiac episodes registered, five had been evaluated by mental health services because of depressive symptoms or dysthymia (16.6%), and one had experienced a rheumatic episode. Only 16 patients (53.3%) did any type of physical exercise, with seven patients (43.8%) performing such regularly. Lesion location was L4–L5 on 50% of patients and L5–S1 on the other 50%. Time of symptomatology evolution until surgery was 22.4 months (range: 1–72 months), with 55.2% of cases having a time length of more than one year. Notably, this time was longer in male patients: 70.6% of them had symptoms for more than a year before surgery versus only 33.3% of female patients ($p < 0.05$). Prior to surgery, 28 patients (93.3%) had lumbar pain, 23 patients (76.6) had paraesthesia, and 22 (73.3%) had a positive Lasègue sign. Additionally, it was noted that walking claudication because of pain existed in 11 patients (36.6%), a reduction of strength was present in eight patients (26.6%), and a loss of any tendon reflexes was observed in another eight patients.

The 87.5% of patients who presented a reduction of strength in the lower extremities before surgery had a disc herniation on L4-L5 ($p < 0.05$). This variable was also compared with obesity: notably, 55.6% of obese patients had a reduction of strength before surgery as compared with 11.8% of nonobese patients ($p < 0.03$).

Regarding signs and symptoms after surgery, a reduction in strength persisted in three patients (10%), a loss of tendon reflexes persisted in another three, and paraesthesia on the lower extremities was noted in nine patients (30%). Male patients had more lumbar pain after surgery (75%) versus 27.3% of female patients ($p < 0.05$). The three patients with a reduction of strength in the lower extremities after lumbar microdiscectomy were all older than 50 years of age.

There were no intraoperative complications, while only one patient presented with postsurgery complications (urinary retention). Concerning economic factors, the PHCC codes of patients ranged from 002 to 004. Specifically, seven patients had PHCC 002 (23%), 20 patients had PHCC 003 (66.6%) and three patients had PHCC 004 (10%) (Figure 1). The return to work variable was evaluated at three, six, and 12 months after surgery. At three months after surgery, 30% of patients had returned to work, while 46.7% at six months and 66.7% at one year had done so (Figure 2). It was not observed that there was a statistically significant association between return to work and PHCC code, but it was associated with other studied variables. The 60% of patients who returned to work had a symptomatology time before surgery of less than a year. Conversely, the 88.9% of patients who did not return to work had a symptomatology time before surgery of more than 12 months ($p < 0.05$) (Figure 3). Moreover, only 9% of patients who suffered walking claudication before surgery returned to work in the first three months after surgery, while 44.4% of patients who did not demonstrate this condition returned to work in the first three months after surgery ($p < 0.05$).

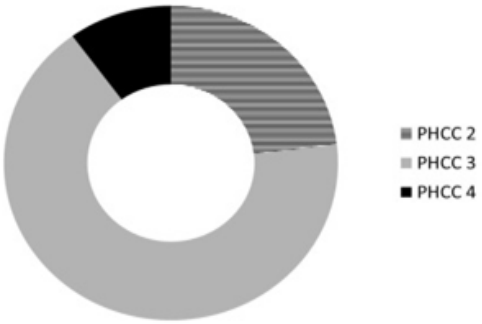

Figure 1: Graphic Representation of PHCC.

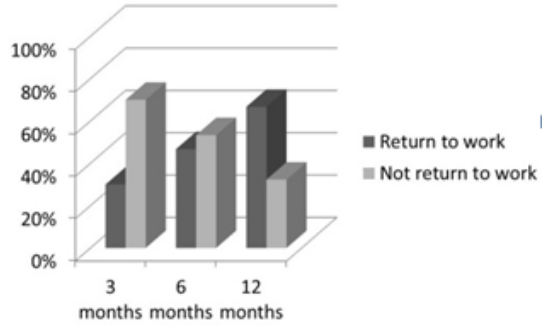

Figure 2: The return to work variable at 3, 6 and 12 months.

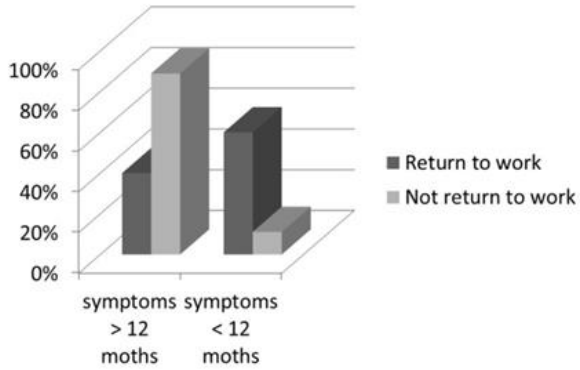

Figure 3: The return to work and symptomatology time before surgery.

Half of the patients in this study were working at a job that required them to manage physical loads, with 80% of them being male. In this study, 66.7% of male patients had a physical job versus 25% of female patients ($p < 0.05$), which was associated with a higher risk of nonreturn to work or late return to work. Only 6.7% of physical load workers returned to work before three months after surgery, while 53.3% of nonphysical workers did ($p < 0.05$). Furthermore, 20% of physical workers had returned to work after six months versus 73.3% of nonphysical workers ($p < 0.005$), while after a year, 46.7% of physical workers did, while 86.7% of nonphysical workers did ($p < 0,05$) (Figure 4).

Here, 53.3% of responsible surgeons had more than 10 years of experience. Concerning this variable, it was noted that patients who had been operated on by a surgeon with 10 years or less of experience had a 4.3-fold higher risk of operating on a patient who demonstrated a nonreturn to work after a year as compared with patients operated on by surgeons with more than 10 years of experience.

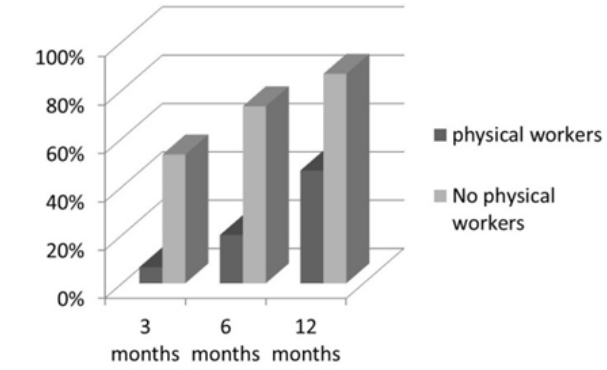

Figure 4: The return to work and physical load workers.

In the present study, 67% of patients returned to work before a year. Our results are similar to those of other studies published about the same subject. Dauch, et al. [18] pointed out a return to work rate of 56% to 58%, while Donceel, et al. [19] pointed it out to be 70% to 80%. Time before returning to work after surgery has been used by different authors as a prognostic factor or even as a success indicator of lumbar microdiscectomy [1,13]. However, return to work not only depends on clinical symptoms; it is also influenced by patient-dependent psychosocial and labour factors [9]. Accordingly, there are only a limited number of studies that have evaluated the relationships with economic factors [14]. One of the objectives of our study was to evaluate the association between PHCC value, used as an economic indicator, and return to work. We have not found any statistically significant association; however, we must consider the fact that the codes of health care cards range between 001 and 006, while our patient's codes ranged between 002 and 004-that is, we had no extreme values in our sample. We have not had any 005- or 006-coded patients in our public hospital in some time, mainly because they receive medical care at other authorised centres, mutual insurance companies, or private hospitals.

PHCC value was chosen to be used as an indirect measure of patients' incomes and socio-occupational situations. This marker can be obtained from patients' medical history. However, each PHCC value includes a wide range of incomes, which can be traduced to a patient whose income is 82.000€ higher than that of others having the same PHCC value. The use of other economic indicators,

such as salary or tax declarations, could be of a higher utility to evaluate the relationship between a patient's economy and return to work. The development of studies including every economic indicator could show the existence of a relationship between patient's economic situation and their return to work [14]. In this way, it could be questioned whether the utility of return to work works as a prognostic factor or success indicator in microdiscectomy following lumbar disc herniation.

The relationship between physical load work and late return or nonreturn to work, has already been highlighted in previous studies [9]. Heavy physical load work causes higher pain in the patient necessitating a longer recovery time and thus delaying or even excluding a return to work [20,21]. In our study, the association between high physical load workers and nonreturn to work was remarkable at three as well as six months after surgery, and was also present to a lesser but still statistically significant degree at 12 months. The average age of our sample was 49.3 years old, which is very similar to the age, obtained by other studies such as Parker, et al. [18] at 42.9 years old. Male patients compose 60% of our patient sample, which could be related to the fact that men dedicate themselves with a higher frequency to heavy physical load jobs; just 25% of female patients of our study participated in such work versus 66.7% of male patients. This type of work could provoke the development of spine pathologies [22] such as the one we studied.

On the other hand, 35.7% of patients were obese (BMI > 30 kg/m^2), a higher percentage compared to the one in general population (16.9%). Obesity and overweightness are risk factors for lumbar disc pathologies [23,24] and, in our study; obesity was associated with a higher risk of a reduction in strength in the lower limbs prior to surgery. The most frequently identified medical history episodes were cardiac ones (33.3%), followed by psychiatric ones (23.3%). Regarding the latter category, depression has been noted to be a prognostic factor for lumbar microdiscectomy [13]. However, in our study, we did not find any relationship between previous psychiatric episodes and unsatisfactory results after surgery.

Separately, we found other prognostic factors that influenced the return to work, such as time of symptomatology before surgery, walk claudication before surgery, and surgeon expertise. According to the data obtained, symptomatology duration before surgery of more than year is associated with a lesser rate of return to work after lumbar microdiscectomy. In this period, we included the diagnosis time [25] as well as the time during which each patient received other types of treatments [2,26]. Ashutosh, et al. [27] concluded after a systematic review that surgery should be undertaken between the second month and one year after the beginning of symptoms, as they couldn't find any shorter time interval due to the diversity of analysed studies [26]. Our study overlaps with this research, showing that delaying microdiscectomy by more than a year is a negative prognostic factor for the surgery. However, it could be convenient to create a protocol to establish a precise range for the optimal period of time in which to perform this surgery. Furthermore, walk claudication because of pain before surgery is associated to a reduced return to work at three months after microdiscectomy. This symptom takes a longer time of recovery to resolve, probably because of larger disc herniation.

Another of the identified prognostic factors is surgeon expertise. Our study proves the existence of a higher return to work rate before one year in patients operated on by surgeons with more than 10 years of experience. A more precise surgical indication as well as better surgical techniques could be reasons for this association.

Conclusion

There is a lesser rate of return to work in patients with heavy physical load jobs, a longer time of symptomatology before surgery, walk claudication before surgery, and patients operated on by surgeons with less than 10 years of experience.

The relationship between return to work and a patient's economic situations should continue to be investigated in future studies not showing its association with PHCC code as being statistically significant.

References

1. Rushton A, Heneghan NR, Calvert M, Heap A, White L, et al. (2015) Physiotherapy post lumbar discectomy: Prospective feasibility and pilot randomised controlled trial. PLoS One 10(11): e0142013.

2. Van der Windt DA, Simons E, Riphagen II, Ammendolia C, Verhagen AP, et al. (2010) Physical examination for lumbar radiculopathy due to disc herniation in patients with low-back pain. Cochrane Database Syst Rev 17(2): CD007431.

3. Wang HQ, Samartzis D (2014) Clarifying the nomenclature of intervertebral disc degeneration and displacement: from bench to bedside. Int J Clin Exp Pathol 7(4): 1293-1298.

4. Jordan JL, Konstantinou K, O'Dowd J (2009) Herniated lumbar disc. BMJ Clin Evid 26: 1118.

5. Veresciagina K , Spakauskas B, Ambrozaitis KV (2010) Clinical outcomes of patients with lumbar disc herniation, selected for one-level open-discectomy and microdiscectomy. Eur Spine J 19(9): 1450-1458.

6. Rasouli MR, Rahimi-Movaghar V, Shokraneh F, Moradi-Lakeh M, Chou R (2014) Minimally invasive discectomy versus microdiscectomy/open discectomy for symptomatic lumbar disc herniation. Cochrane Database Syst Rev 4(9): CD010328.

7. Qin Z, Liu X, Yao Q, Zhai Y, Liu Z (2015) Effectiveness of acupuncture for treating sciatica: a systematic review a meta-analysis. Evid Based Complement Alternat Med, 425108.

8. Kim TW, Oh CH, Shim YS, Yoon SH, Park H, et al. (2013) Psychopathological influence of lumbar disc herniation in male adolescent. Yonsei Med J 54(4): 813-818.

9. Puolakka K, Ylinen J, Neva MH, Kautiainen H, Häkkinen A (2008) Risk factors for back pain-related loss of working time after surgery for lumbar disc herniation: a 5-year follow-up study. Eur Spine J 17(3): 386-392.

10. Hussein M, Abdeldayem A, Mattar MMM (2014) Surgical technique and effectiveness of microendoscopic discectomy for large uncontained lumbar disc herniations: a prospective, randomized, controlled study with 8 years of follow-up. Eur Spine J 23(9):1992-1999.

11. Jacobs WCH, Arts MP, van Tulder MW, Rubinstein SM, van Middelkoop M, et al. (2012) Surgical techniques for sciatica due to herniated disc, a systematic review. Eur Spine J 21(11): 2232-2251.

12. Rushton A, Heneghan N, Heijmans MW, Staal JB, Goodwin P (2016) Natural course of pain and disability following primary lumbar discectomy: protocol for a systematic review and meta-analysis. BMJ Open 6(2): e010571.

13. Kohlboeck G, Greimel KV, Piotrowski WP, Leibetseder M, Krombholz-Reindl M, et al (2004) Prognosis of multifactorial outcome in lumbar discectomy: A prospective longitudinal study investigating patients with disc prolapse. Clin J Pain 20(6):455-461.

14. Atlas SJ, Tosteson TD, Blood EA, Skinner JS, Pransky GS, et al. (2010) The impact of workers' compensation on outcomes of surgical and nonoperative therapy for patients with a lumbar disc herniation: SPORT. Spine (Phila Pa 1976) 35(1): 89-97.

15. Asher AL, Chotai S, Devin CJ, Archer-Swygert K, Parker SL, et al. (2017) Predictive model for return to work after elective surgery for lumbar degenerative disease: An analysis from National Neurosurgery Quality Outcomes Database Registry. J Neurosurg Spine 27(4): 370-381.

16. Agencia Estatal Boletín Oficial del Estado. Medidas urgentes para garantizar la sostenibilidad sel Sistema Nacional de Salud y mejorar la calidad y seguridad de sus prestaciones. BOE Nº 98 Real Decreto-ley 16/2012; 31278-31312

17. Bland JM, Altman DG. The odds ratio (2000) BMJ 320(7247): 1468.

18. Dauch WA, Fasse A, Brucher K, Bauer BL (1994) Predictors of treatment success after microsurgical operation of lumbar intervertebral disk displacement. Zentralbl Neurochir 55(3): 144-155.

19. Donceel P, Du Bois M (1999) Predictors for work incapacity continuing after disc surgery. Scand J Work Environ Health 25(3): 264-271.

20. Seidler A, Bergmann A, Jäger M, Ellegast R, Ditchen, et al. (2009) Cumulative occupational lumbar load and lumbar disc disease. Results of a German multi-center case-control study (EPILIFT). BMC Musculoskelet Disord 10: 48.

21. Petit A, Roquelaure Y (2015) Low back pain, intervertebral disc and occupational diseases. Int J Occup Saf Ergon 21(1): 15-19.

22. Parker SL, Mendenhall SK, Godil SS, Sivasubramanian P, Cahill K, et al. (2015) Incidence of low back pain after lumbar discectomy for herniated disc and its effect on patient-reported outcomes. Clin Orthop Relat Res 473(6): 1988-1999.

23. Instituto Nacional de Estadística (2014) Encuesta Europea de Salud 2014 - Determinantes de salud: Cifras relativas. Características físicas - Indice de masa corporal en población adulta según sexo y grupo de edad: población de 18 y más años. INEbase.

24. Shiri R, Lallukka T, Karppinen J, Viikari-Juntura E (2014) Obesity as a risk factor for sciatica: a meta-analysis. Am J Epidemiol 179(8): 929-937.

25. Nijs J, Apeldoorn A, Hallegraeff H, Clark J, Smeets R, et al. (2015) Low back pain: guidelines for the clinical classification of predominant neuropathic, nociceptive, or central sensitization pain. Pain Physician. Pain Physician 18(3): E333-E346.

26. Sabnis AB, Diwan AD (2014) The timing of surgery in lumbar disc prolapse: A systematic review. Indian J Orthop 48(2): 127-135.

27. Ashutosh S, Mark Bernstein (2002) Outpatient lumbar Microdiscectomy. A prospective study in 122 patients. Can J Neurol Sci 29(3): 249-252.