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What is the Impact of Lumbosciatic Infiltration on the Evolution of Herniated Disc and Dorsolumbar Asthrosis?

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Abstract

Lumbosciatica is a frequent reason for consultation in general medicine and emergency medicine with an estimated incidence between 2% and 14%. There are several therapeutic modalities, including infiltrations, which are very controversial. Based on this observation, we conducted a prospective study in which 19 patients had undergone epidural and peri-radicular infiltration; the epidural was the most represented infiltration in 68.4% of the patients, the peri-radicular was in 21.1% of them and the combination of both was in 10.5% of the cases, with only 30.6% of the infiltrations carried out under radioscopy. The molecules used were Triamcinolone Acetonide-based Kenacort and Methylprednisolone Acetate-based Depo-Medrol. The evolution of post-infiltration pain decreased significantly in 94.7% of cases, with a statistically significant difference ($p = 0.04$). No complications were observed in our patients and none of them had resorted to surgery during the follow-up period except for a single case of recurrence of pain relieved by periodic spaced infiltrations. Despite the small size of our sample, we can conclude that infiltration techniques still have a place in the management of Lumbosciatica alongside the surgery.

Keywords

Lumbosciatica, Infiltration, Evolution

1. Introduction

Common Lumbosciatica is a frequent reason for consultation in general medi-

cine and emergency medicine. The annual incidence is difficult to evaluate because of the multiple definitions found in the literature. It is estimated to be between 2% and 14% [1]. The treatment of radiculalgia is primarily medical. It is based on analgesics, anti-inflammatories, muscle relaxants and relative rest. In case of failure of the previous treatments, spinal corticosteroid infiltrations are widely practiced [2]. But their usefulness remains controversial in particular because of the lack of studies documenting their effectiveness with a satisfactory level of proof [3]. A meta-analysis of 87 services showed a satisfaction rate of at least 65%. The limitations of these studies remain so considerable that none of them mentions a reduction in the use of surgery [4], which motivated us to carry out a prospective study to evaluate the impact of infiltrations on the evolution of lumbosciatica in our hospital.

2. Patients and Method

We had conducted a prospective descriptive epidemiological study over a period of one year, from early December 2019 to December 31st 2020, to evaluate the management of pain by infiltration. These were either patients with herniated discs, narrow lumbar canal, dorsolumbar arthrosis or hyperalgesic sciatica without indication for surgery or deferred surgery, or patients who refused surgery.

- All our patients were referred by neurosurgeons for Lumbosciatica or sciatica with an imaging available either in CT or in MRI. These two had highlighted the radiological lesions. The indication for infiltration was determined by the neurosurgeon in the absence of a clear surgical indication and the refusal of certain patients to undergo surgery, and then they were referred to us for pre-infiltration evaluation.
- Many synonyms for sciatica appear in the literature, such as lumbosacral radicular syndrome, ischias, nerve root pain, and nerve root entrapment. In about 90% of cases, sciatica is caused by a herniated disc with nerve root compression, but lumbar stenosis and (less often) tumours are possible causes [5].
- Our patients come from all regions of Chad. This may be a global representation of the population despite the small sample size.
- All the patients referred to during the study period were recruited in our sample
- After an anamnesis and a clinical, or biological examination eliminating a contraindication to the infiltration, such as an abscess in front of the infiltration site (a coagulopathy, an anticoagulant treatment) and following the patient's consent, we opted for a programmed infiltration, except for hyperalgesic lumbosciatic pain which is carried out as soon as possible.
- Infiltration sessions were carried out either by fluoroscopic or by anatomical location after using CT or MRI data.
- We carried out either a peri-radicular, an epidural infiltration, or a combina-

tion of both depending on the symptomatology and imaging data.

- Our protocol was to carry out an infiltration session and evaluate the pain; the infiltration rhythm is spaced one week apart, *i.e.*, on the 8th day if the pain persists, and a maximum of 3 sessions in a month. For chronic arthrosis, a session could be carried out every three to four months depending on the degree of the pain.
- The molecules used were: Triamcinolone Acetonide-based Kenacort 80 mg and Methylprednisolone Acetate-based Depo-Medrol 80 mg.
- The pain was evaluated by the VAS (Visual Analog Scale) or VSS (Visual Simple Scale) method at pre-infiltration, one week apart post-infiltration, followed by three months and then by one year.
- The data were statistically analyzed: The results were presented in the form of means and standard deviations for quantitative variables and in the form of percentages for qualitative variables. The data were processed with SPHINX version 5 and analyzed with SPSS (Statistical Package for Social Sciences) Statistics version 25. The significance threshold was retained for a p-value < 0.05. (Chi-square test). The Shapiro test was used to test the normality of the distribution of the variables and the Pearson correlation was used to determine the strength of association.

3. Results

During our study period, 19 patients had undergone infiltration, with male predominance (68% of cases), *i.e.* a sex ratio of 2.17 (Table 1). The average age of our population was 45 years with extremes of 27 and 74 years (Table 2). The majority of our patients (63.2%) had no previous pathological background. however, 21.1% (n = 4) had a background of a known Lumbosciatica and were under follow-up without clinical improvement.

According to the circumstances of finding the pathology, lumbosciatica was

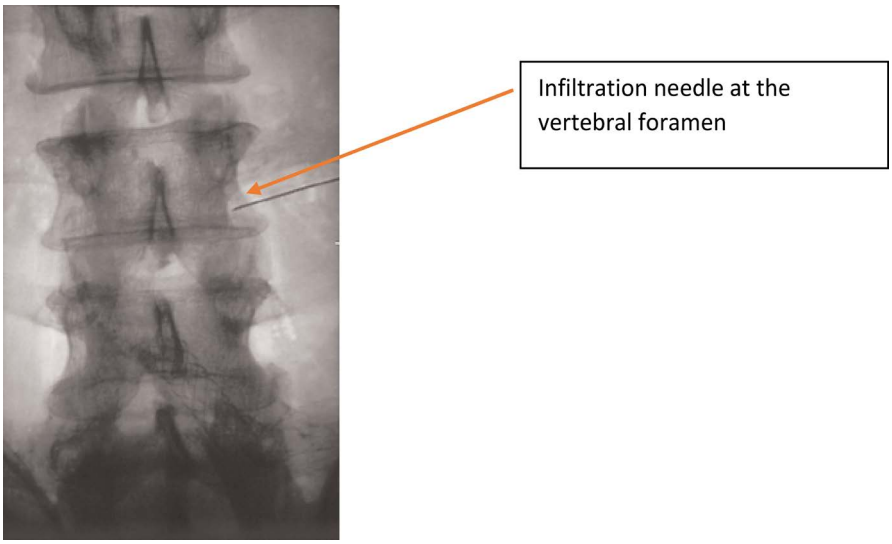

Figure 1. Image of a peri-radicular infiltration: iconography taken from the reference [2].

the predominant symptomatology in 9 cases, *i.e.* 47.4%, that of sciatica in 4 cases, *i.e.* 21.1%, including one hyperalgesic case, and 6 cases of isolated lumbago, *i.e.* 31.6%.

According to the imaging data, we had found the following pathologies:

Lumbar disc herniation predominated in 68.4% of cases, followed by arthrosis in 21.1% of cases as described in Figure 2, with a degree of pain considered intense and very intense respectively in 68.4% and 31.6% of cases before infiltration.

Table 1. Gender distribution.

Gender	workforce	Percentage
Female	6	32%
Male	13	68%
Total	19	100%

Table 2. Age distribution.

Age group	Workforce	Percentage
17 - 40	6	31,6
41 - 61	11	57,9
62+	2	10,5
Total	19	100,0

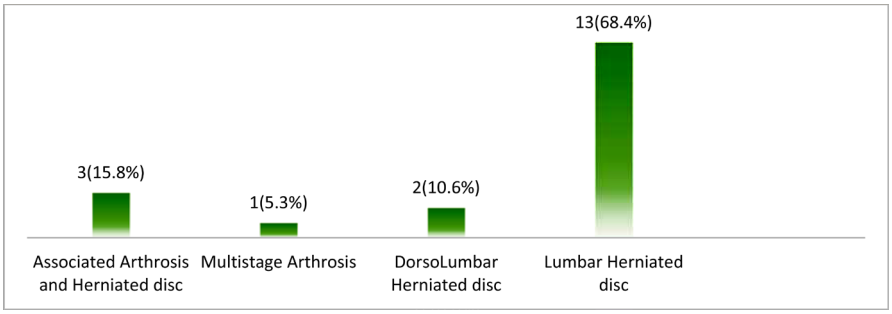

Figure 2. Imaging diagnosis.

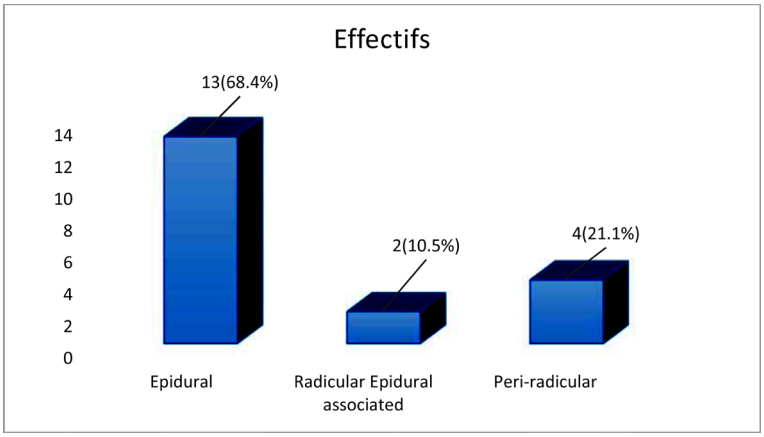

Figure 3. Type of infiltration carried out.

Table 3. Evolution of pain after infiltration.

		Post-infiltration pain assessment			Total
		Level 1	Level 2	Level 3	
Initial pain assessment:	Level 3	4	8	1	13
	Level 4	2	3	1	6
Total		6	11	2	19

The epidural infiltration was the most carried out in 68.4% of the patients, followed by a peri-radicular infiltration in 21.1%, the combination of epidural and peri-radicular in 10.5% of cases and 30.6% of the infiltrations were carried out under fluoroscopy.

Triamcinolone Acetonide-based Kenacort was predominant in 94.7% and Methylprednisolone Acetate-based Depo-Medrol in 5.3% of cases; two immediate side effects were observed: two cases of pain at the injection site and one case of vagal malaise.

The post-infiltration pain was significantly reduced according to this cross-reference table. The difference was statistically significant with $p = 0.04$; 65% of the patients who had received only one infiltration. 29% had received 2 infiltrations and only one patient had received 4 infiltrations with one infiltration every 3 months. This was a case of arthrosis.

Long-term evolution at 3 months and at one year: only one case of recurrence of Lumbosciatica at one year with a level of Simple Verbal Scale (SVS) reduced from 3 to 2 after infiltration with kenacort 80 mg. Almost all our patients had a favorable clinical evolution. They had not had recourse to surgery and there was no recurrence of pain in any of them. No complications related to the infiltration were detected during our study period.

4. Discussion

The mean age of our patients was 45 years with extremes of 27 and 74 years (see **Table 2**). This age is lower than the average age found in a series of 116 patients for infiltrations, but with a slight female predominance in 54% of cases [6] compared with 68% of males in our study (see **Table 2**). Our sample size was similar to this prospective survey of 20 patients [7] versus 19 ones for our study. Their survey included forty-one (41) of which 20 patients evaluated by prospective study as in our study and 21 patients by retrospective study. All suffered from S_1 lumbosciatica in relation to lumbar disco-radicular conflict proven by lumbar CT [7], as in our sample where 68.4 % of patients presented a lumbar herniated disc, see **Figure 2**. The mean age of our study population was similar to other studies: 51.8 years in a study population of 280 patients with a similar sex ratio 1.25 [1].

Several infiltration techniques such as posterior inter-apophyseal infiltration have been reported [2] (**Figure 1**). But disappointing results have been observed in the few studies. Intradural injections (Luccherini technique) have not proven their superiority over epidurals with potentially serious side effects. More re-

cently, a peri-radicular infiltration technique has been developed. This involves the injection of a product at the outlet of the intervertebral foramen, close to the dorsal radicular ganglion. We use this last technique for peri-radicular infiltrations as carried out by certain authors [2].

Epidural infiltrations are the most commonly carried out, as the location is anatomical. Foraminal infiltrations are more rarely carried out because they are more prone to neurological or vascular complications. This treatment is only adapted to foraminal disc herniations [8]. In our study, epidural infiltrations predominated in 68.4% of the cases (**Figure 3**). This did not require fluoroscopy. We carried out the same techniques as many authors for the same indications [1] [2] [8] [9]. Only 30.6% of our patients had received a peri-radicular infiltration under fluoroscopy. The technique consisted in injecting the product at the outlet of the intervertebral foramen where the root emerges, the injection point being located opposite the foramen as described by other authors [2]. A systematic review of the literature from 2009 [10] concludes that this method of infiltration is superior. However, there is no comparative clinical trial of satisfactory power to confirm this superiority [1]. In the case of lumbar pathologies, an alternative via the sacro-coccygeal hiatus may be used [9]. Other authors use echo-guidance for sacro-coccygeal epidural infiltrations only for lumbar pain [6].

As for the frequency of infiltrations, no more than 3 to 4 injections are indicated for an episode because there is no additional effect to this treatment. It is also recommended not to insist on it if there is no effectiveness after 2 infiltrations [1]. Other patients had received 2 radio-guided L5-S1 foraminal infiltrations 8 days apart [7]. In our study, the majority of our patients had received only one infiltration, *i.e.* 65% of the patients, as opposed to 29% who had received 2 infiltrations. And only one patient had received 4 infiltrations with one infiltration every 3 months. This was a case of advanced multistage arthrosis. Our rate infiltration was in line with the norms cited in the literature in terms of frequency of infiltration and the time between infiltrations, or even our frequency is lower with satisfactory results [1] [7].

Numerous accidents and side effects have been described with infiltration techniques. The FDA (Food and Drug Administration) conducted a survey over the period 1997-2004 which identified 90 serious neurological accidents, epidural hematomas, direct trauma to the spinal cord, or spinal or medullary embolic infarctions [11]. Significant exacerbation of pain, fever, chills or altered general condition should be considered as warning symptoms for an infectious complication [9].

As for the products used, the occurrence of secondary embolism has been described during intra-arterial injection of the corticoid. Some depositions of corticoids, such as methylprednisolone, triamcinolone acetonide and dexamethasone have crystals with a diameter greater than 50 μm [12]. In another animal model of intra-arterial injection, direct toxicity leading to cerebral infarctions

was observed with SoluMedrol and Depo-Medrol but not with dexamethasone [9]. We did not observe any of these effects despite the use of Depo-Medrol and Triamcinolone acetonide. Only two cases of pain at the injection site (during the epidural injection due to insufficient local anesthesia on the path of the infiltration) and one case of rapidly resolving vagal malaise would be much more related to anxiety.

Controversies on the effectiveness of infiltrations have existed for a long time. But it has been well accepted that epidural infiltrations reduce the rate of recourse to surgery. Similarly, it has not been demonstrated that infiltrations allow a faster return to work [4]. The prognosis is favorable in 95% of cases of recovery at one year, whatever the treatment. But with surgery, the time to recovery is divided by three [13]. These observations [4] [13] would comfort our study, in which the evolution was favorable for almost all the patients, *i.e.* 94.7% of the cases, with a clear improvement of the pain, the difference being statistically significant with $p = 0.04$ (see **Table 3**). There was no recurrence of pain for the majority, nor was there any surgical intervention. Only one case of advanced multistage arthrosis with pain recurring approximately every three months required an infiltration. In another study, we found a significant improvement of radiculalgia in 60% of patients on D8, 60% to 67% on D30 and 67% on D90 [7]. For a similar number of patients, our results were slightly better than those of this study, which had 18 patients versus 19 ones in our study.

The limitation of our study is confirmed by the small sample size as well as by the follow-up duration which was limited to one year. Nevertheless, the sample was representative of all socio-demographic backgrounds of the country. Despite this small sample size, we found favorable results of infiltration such as those observed by the meta-analysis in 87 services [4].

5. Conclusion

From the review of the literature, we note that the evolution of lumbosciatica due to disc herniation is often favourable to non-surgical treatment and the infiltrations would remain the recourse in case of failure of other medical means. Surgery would always remain the reference treatment. We found a clear improvement in pain after infiltration in almost all patients, *i.e.* 94.7% of cases. No notable complications related to the infiltrations were detected and none of our patients had resorted to surgery during our follow-up period. In view of our results, despite the small size of our sample and the observations of the literature, the infiltrations would still have a place in the management of this pathology, and even avoid or delay surgery in the absence of a complication. From these observations, we will have to carry out other studies with a more representative sample size to draw recommendations.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this pa-

per.

References

[1] Yanis, N. (2017) Etude descriptive de la prise en charge des lombosciatalgies dans la Structure d'Urgence du Centre Hospitalier de Saint-Dié-des-Vosges. THESE Pour obtenir le grade de docteur en médecine. Faculté de médecine de Nancy, Université de Lorraine.

[2] Daumen-Lègre, V. and Pham, T. (2000) Infiltrations péri radiculaires lombaires, Bases anatomiques et physiopathologiques. *La Lettre du Rhumatologue*, **260**, 24-28.

[3] Lazarou, I., Genevay, S. and Nendaz, M. (2011) Utilisation de corticostéroïdes lors de lomboradiculalgies par hernie discale. *Revue Médicale Suisse*, 7, 2041-2045.

[4] Rozenberg, S. and Bourgeois, P. (2005) Le traitement de la lombosciatique discale aiguë, Treatment of acute sciatica. La Lettre du Rhumatologue, 313, 19-21.

[5] Koes, B.W., Van Tulder, M.W. and Peul, W.C. (2007) Diagnosis and Treatment of Sciatica. *BMJ*, **334**, 1313-1317. https://doi.org/10.1136/bmj.39223.428495.BE

[6] Patenere, C. (2019) Évaluation de l'efficacité et de la tolérance des infiltrations échoguidées par le hiatus sacro coccygien au Centre Hospitalo-Universitaire de Rouen. *Thèse pour le Doctorat en Médecine*, 63.

[7] Michel, J.L., Lemaire, S., Bourbon, H., Reynier, C., Lhoste, A., Soubrier, S., Dubost, J.J. and Ristori, J.M. (2004) Infiltration foraminale L5-S1 radioguidée dans le traitement de la lombosciatique S1. *Journal de Radiologie*, **85**, 1887-1960. https://doi.org/10.1016/S0221-0363(04)97763-3

[8] Rafael, Z.P., Chris, G.M., Manuela, L.F., Paulo, H.F., Mark, H., Vinicius, C.O., Andrew, J. and Bart, K. (2012) Drugs for Relief of Pain in Patients with Sciatica: Systematic Review and Meta-Analysis. *BMJ*, **344**, e497. https://doi.org/10.1136/bmj.e497

[9] Evangelia, P. and Stéphane, G. (2017) Complications des infiltrations Rachidiennes. *Revue Médicale Suisse*, **13**, 554-558.

[10] Roberts, S.T., Willick, S.E., Rho, M.E. and Rittenberg, J.D. (2009) Efficacy of Lumbosacral Transforaminal Epidural Steroid Injections: A Systematic Review. *PM & R*, **1**, 657-668. https://doi.org/10.1016/j.pmrj.2009.04.008

[11] Racoosin, J.A., Seymour, S.M., Cascio, L. and Gill, R. (2015) Serious Neurologic Events after Epidural Glucocorticoid Injection—The FDA's Risk Assessment. *The New England Journal of Medicine*, **373**, 2299-22301. https://doi.org/10.1056/NEJMp1511754

[12] Laredo, J.D., Laemmel, E. and Vicaut, E. (2016) Serious Neurological Events Complicating Epidural Injections of Glucocorticoid Suspensions: Evidence for a Direct Effect of Some Particulate Steroids on Red Blood Cells. *RMD Open*, **2**, e000320. https://doi.org/10.1136/rmdopen-2016-000320

[13] Florence, S.A., Vincent, F., Marc, M. and Pierre-Alain, B. (2010) Quand référer aux urgences un patient présentant une lombalgie/lombosciatalgie aiguë? *Revue Médicale Suisse*, **6**, 1540-1545.