

## Perbandingan Radiofrekuensi Denervasi dan Terapi Konservatif dalam Tatalaksana Nyeri Punggung Bawah Kronik yang Bersumber dari Sendi Facet

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### ABSTRAK

**Pendahuluan.** Sendi facet merupakan salah satu sumber utama nyeri punggung bawah kronis (15-45%). Penelitian-penelitian yang telah dilakukan memperlihatkan variasi hasil baik dalam diagnosis maupun pengobatan sehingga sampai saat ini belum ada standar terapi yang dapat diandalkan untuk nyeri punggung bawah kronis yang dimediasi oleh sendi facet.

**Bahan dan cara kerja .** Penelitian menggunakan desain kuasi eksperimental. Sampel diambil secara konsekutif sebanyak 120 orang setelah memberikan hasil positif pada facet blok diagnostik yang ditandai dengan penurunan skor nyeri Visual Analog Scale > 50%. Sampel dibagi ke dalam 2 grup yaitu yang mendapatkan terapi konservatif dan terapi radiofrekuensi denervasi. Nilai Oswestry Disability Index diukur sebelum dan sesudah terapi, serta pada bulan ke-3 dan ke-6.

**Hasil.** Terdapat perbedaan yang signifikan nilai Oswestry Disability Index antara terapi radiofrekuensi dan konservatif pada bulan ke-3 dengan nilai  $p=0,004$ . Tidak terdapat perbedaan yang signifikan antara terapi radiofrekuensi dan konservatif pada bulan ke-6 dengan nilai  $p=0,521$ .

**Kesimpulan.** Radiofrekuensi memberikan efektifitas yang lebih baik setelah 3 bulan, akan tetapi setelah 6 bulan memberikan efektifitas yang sama dengan terapi konservatif pada penderita nyeri punggung bawah kronis yang dimediasi oleh sendi facet.

**Kata kunci:** nyeri punggung bawah kronis, sendi facet, radiofrekuensi denervasi, Oswestry Disability Index

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## Efficacy Comparison of Radiofrequency Denervation to Conservative Treatment in Chronic Low Back Pain of Facet Origin

### ABSTRACT

**Introduction.** Lumbar facet joints have been implicated as the source of pain in 15% to 45% of patients with chronic low back pain. Many studies showed various and unsatisfactory results either in establishing the diagnosis or in the treatment of chronic low back pain causing lack of standard treatment for chronic low back pain of facet origin.

**Materials and methods.** The study used quasi experimental design and was conducted in Fatmawati and Bintaro international hospital, Jakarta. The study included 60 patients in group I with radiofrequency denervation of medial branch and 60 patients in group II with conservative treatment. The inclusion criteria was based on the positive response to facet diagnostic block (Visual Analog Scale pain score decreased >50%). Oswestry Disability Index was calculated in both of groups before and after treatment. Assessments were performed at baseline, third month, and sixth months.

**Results.** Significant difference in functional improvement between radiofrequency and conservative group was found at third month ( $p=0.004$ ) but not sixth month ( $p=0.521$ ).

**Conclusions.** Radiofrequency of medial branch may provide better result than conservative treatment in 3 month but not in 6 months in functional effectiveness of chronic low back pain of facet joint origin.

**Keywords:** chronic low back pain, lumbar facet joint pain, radiofrequency of medial branch, Oswestry Disability Index score

### Introduction

Chronic low back pain, defined as back pain with onset of more than 12 weeks, is a major health problem all over the world. It is one of the most common complaints in musculoskeletal disorders. It causes disabilities and affects quality of life. Eighty percent of adults will have at least one period of low back pain during their life. Most of low back pain will response to conservative treatment, 60 % will be recurrent, while 15-30% will become chronic low back pain.<sup>1,2</sup>

Pain in lumbar spine can be generated from many structures. Facet joint is one of the potential pain generators in low back pain.<sup>3</sup> Hence the term facet syndrome was introduced by Ghormely in 1933.<sup>4</sup> It is estimated that 15-52% of chronic low back pain was contributed by facet joint pathology.<sup>5-8</sup> Facet joint interventions has now become the second most common procedures carried out to manage low back pain in United States.<sup>9</sup> Nevertheless, the diagnosis and treatment of facet joint pathology remains controversy.<sup>3</sup>

Current managements for low back pain include conservative treatment, facet block, and radiofrequency de-

nervation. Radiofrequency denervation has now considered to be the gold standard due to its intermediate and long term relief in patients who positively respond to diagnostic blocks.<sup>10-12</sup>

In Indonesia, we have no efficacy data of radiofrequency denervation or conservative treatment in managing chronic low back pain of facet origin. In the present study, we sought to compare long term functional outcome between conservative treatment and radiofrequency denervation in managing chronic low back pain of facet origin.

### Materials and methods

The quasi experimental study was done in Fatmawati and Bintaro International hospital Jakarta during January 2009 to December 2010. Samples were consecutively enrolled from chronic low back pain patients presented to the hospitals with clinical criteria related to facet syndrome which are unilateral or bilateral paravertebral pain, non-radicular, aggravated by rotation and extension rather than flexion movement, and the evidence of facet degeneration on imaging. Diagnosis of chronic low back

pain of facet origin was confirmed by diagnostic block of medial branch of dorsal rami block of affected facet using 1.5-2 ml of 2% lidocaine. The diagnostic blocks were done twice for each facet. The positive result of diagnostic block were achieved if there was decreasing on VAS score more than 50% compare to pre-diagnostic block.<sup>13</sup> One hundred and twenty patients were divided into conservative and radiofrequency group equally. All patients who agree to follow the study and suitable with the criteria were given inform consent related to the procedures and were measured ODI and VAS score pre-treatment. Selected patients with positive block were given information about conservative and radiofrequency procedures and allowed to choose freely the procedure to be taken.

Radiofrequency were performed using same tools and procedures for every patients. The tools were Neurotherm NT 1100 (USA) and needle NT select 22G, 10cm cannula, 10 mm active tip. The patient was put in prone position and guided with image intensifier of 10-20 degree to achieve the scotty dog view. The needle was inserted perpendicular to the medial branch between transverse process and superior articular process of facet, by using impedance of 250-500 ohms, sensory stimulation of 50 Hz, 0-1 V and motoric stimulation of 2 Hz, 1-10 V. After stimulation was confirmed, denervation was done by using heat of 80-85°C for 60-90 second.<sup>14-16</sup>

Patients in conservative group received diclofenac sodium as recommended by WHO, external support, and exercise for muscle strengthening and stretching.<sup>1,13</sup>

At the third and sixth month, functional outcome of both groups were measured using ODI and statistically

analyzed to compare the long term functional outcome.

## Results

Most of the subjects included are female, below 50 years old, overweight and had unilateral level of facet pathology. (Table 1)

The effectiveness of conservative treatment after 3 months and 6 months was 48% and 56% respectively compared to pretreatment. The effectiveness of radiofrequency denervation treatment after 3 months was 81% and decreased to 65% after 6 months compared to pretreatment. Using Mann-Whitney test, significant difference was found between two groups at third month ( $p=0.004$ ) but not at sixth month ( $p=0.521$ ). Radiofrequency showed superiority in 3 months than conservative treatment but after 6 months, the statistical analysis showed no significant difference in treating chronic low back pain of facet origin.

## Discussions

Many studies have addressed the conservative management for low back pain. However, none has evaluated conservative management specifically targeted to facet joint pain.<sup>1</sup> The regimens for the conservative treatment in this study are NSAID and acetaminophen, using diclofenac sodium as recommended by WHO, external support (lumbosacral corset), and exercise including muscle strengthening and stretching.

The compliance of the patients to follow the whole conservative procedures may be a confounding factor which can influence the outcome. Unfortunately, this study did not control this factor. Other confounding factors such as age, weight, occupation, smoking, severity

Table 1. Characteristics of sample

Characteristics	Radiofrequency	Conservative	Total
Sex			
Male	24 (40%)	26 (43%)	50 (42%)
Female	36 (60%)	34 (57%)	70 (58%)
Age			
≤ 50 years	30 (50%)	32 (53%)	62 (52%)
≥ 50 years	30 (50%)	28 (47%)	58 (48%)
Body mass index			
Underweight	2 (3%)	4 (7%)	6 (5%)
Normal	13 (22%)	11 (18%)	24 (20%)
Overweight	45 (75%)	45 (75%)	90 (75%)
Facet joint level			
Unilateral	34 (57%)	40 (67%)	73 (61%)
Bilateral	21 (35%)	11 (18%)	32 (27%)
Multilevel	5 (8%)	9 (15%)	14 (12%)

of back pain, and level of facet were also not controlled.

Technique employed for radiofrequency lesioning may influence the success of the procedure. Lesioning occurred at the distal shaft of the electrode rather than at the tip. It results in suboptimal lesioning if the electrode is positioned perpendicular to the nerve.<sup>17</sup> In our study, the decreased VAS pain score of more 50% compare to before diagnostic block was used to confirm the success of the procedure.

Radiofrequency denervation has been proven to provide significant pain reduction in patients with chronic low back pain for 6 to 12 months.<sup>1,18,19</sup> We found no significant difference between radiofrequency and conservative treatment after 6 months, other studies have shown little benefit to this procedure. In either case, it is important to consider any design flaws and limitations of these studies. Nevertheless, there was a significant difference in outcomes observed between the radiofrequency group and sham group at 1 month. However, this was seen only in the patients who had displayed a good response to the diagnostic blocks. The precise procedure for radiofrequency was also not well described.<sup>18,19</sup>

We found significant difference in functional improvement between radiofrequency and conservative group in 3 months. Nevertheless in 6 months, there was no significant difference in functional improvement between radiofrequency and conservative group. We used the same techniques and procedures for each patient to minimize the confounding factors which might influence the results. By using the same techniques and procedures for conservative and radiofrequency, we try to control the confounding factors which can influence the result.

## Conclusions

Radiofrequency of medial branch may provide better result at 3 month compared to conservative treatment, but at 6 months, it provides same result as conservative treatment in functional outcome of chronic low back pain of facet joint origin.

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