

***Facet Joint Injection versus
Radiofrequency Facet Neurotomy as an Adjuvant
Therapy in Conservative Management of
Chronic Low Back Pain***

*A Thesis
Submitted in partial fulfillment of Masters degree in
Neurosurgery
by*

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Abbreviations:

MBB : medial branch blocks.
CGRP : calcitonin gene-related peptide.
chAT : choline acetyl transferase.
CLBP: Chronic low back pain
CT : Computed Tomography.
DBH : dopamine B-hydroxylase.
DRG : Dorsal root ganglion.
FBSS : Failed back surgery syndrome.
LBP : Low back pain
MRI :Magnetic resonance imaging.
PRF : Pulsed radiofrequency.
ST : sympathetic trunk.
RC : rami communicantes.
RF : Radiofrequency.
TN : Trigeminal Neuralgia

INTRODUCTION

Low back pain (LBP) is related to disability and work absence and accounts for high economical costs in western societies. The management of LBP comprises a range of different intervention strategies including surgery, drug therapy, and non-medical interventions (*Andersson GB 1999*).

Linton et al., 1998 estimated the prevalence of spinal pain in the general population as 66%, with 44% of patients reporting pain in the cervical region, 56% in the lumbar region, and 15% in the thoracic region. (*Manchikanti et al 2002*) reported similar results. Despite the high prevalence of spinal pain, it has been suggested that a specific etiology of back pain can be diagnosed in only about 15% of patients with certainty based on clinical examination alone (*Bogduk N et al., 2002*).

Pivotal to the proper management of chronic spinal pain is the ability to pinpoint an anatomical diagnosis. For this purpose, physical examination is neither reliable nor valid (*Bogduk N et al., 2002*). No technique of physical examination has sufficient reliability and validity to allow a patho-anatomic diagnosis to be made (*Bogduk N et al., 2002*).

Radiographic investigations, including magnetic resonance imaging (MRI), reveal only some

conditions with certainty (*Bogduk N et al., 2002*). Medical imaging provides little sound information (*Bogduk N et al., 2002*).

Failed back surgery syndrome is a common problem with enormous costs to patients, insurers, and society, defined as persistent back and/ or leg pain after spine surgery. The etiology of failed back surgery can be poor patient selection, incorrect diagnosis, suboptimal selection of surgery, poor technique, failure to achieve surgical goals, and/or recurrent pathology (*Richard D et al., 2006*).

Pathologies implicated in failed back syndrome (post laminectomy syndrome) includes recurrent herniation, arachnoiditis, instability, epidural fibrosis, spinal stenosis, traumatic neuritis (battered root syndrome), juxtafusal discogenic pain, sacroiliac joint or spinal joint pain, and many others (*Schofferman J et al., 2003*).

Management of post lumbar surgery syndrome with numerous modalities of treatments including interventional techniques, results in moderate improvement, yet leaves a proportion of patients in intractable pain (*Boswell MV et al., 2007*). The success rate of repeat back surgery declines in parallel with the number of reoperations (*North RB et al., 2005*).

Successful intervention in this difficult patient population requires a detailed history, precise physical examination, and carefully chosen diagnostic tests (*Richard D. Guyer et al., 2006*).

Zygapophyseal (Facet) joints have been implicated as the source of chronic pain in 15% to 45% of patients with chronic low back pain (CLBP) (*Manchikanti L et al., 2001*), (*Manchikanti L et al., 2004*). The facet or zygapophyseal joints of the lumbar spine have been shown to be capable of causing pain in the low back with referred pain to the lower extremity in healthy volunteers (*Fukui S et al., 1997*), (*Windsor RE et al., 2002*).

Bogduk postulated that for any structure to be deemed a cause of back pain, it should have a nerve supply; should be capable of causing pain similar to that seen clinically, ideally in healthy volunteers; should be susceptible to diseases or injuries that are known to be painful; and should have been shown to be a source of pain in patients by using diagnostic techniques of known reliability and validity (*Bogduk N 1997*).

Bogduk also postulated that diagnostic blockade of a structure with a nerve supply with the ability to generate pain can be performed to test the hypothesis that the target structure is a source of the patient's pain (*Bogduk N 1997*).

In addition to causing localized spinal pain, facet joints may refer pain to adjacent structures. Pain referral patterns of facet joints have been well described. Cervical facet joint pain may radiated to the neck, head and shoulders and lumbar facet joint pain may refer to the back, buttocks and proximal lower extremities. Referred pain may assume a pseudoradicular pattern, making the underlying diagnosis difficult to confirm (*Gilhool JJ et al., 2003*).

Cervical, thoracic and lumbar facet joints are innervated by the medial branches of the dorsal rami. Facet joint pain may be managed by intraarticular injections, medial branch blocks and neurolysis of medial branch nerves. However, conflicting results have been reported for the value of intraarticular injections of facet joints, medial branch blocks, and radiofrequency neurolysis of medial branches in several systematic and narrative reviews (*Niemisto L et al., 2003*), (*Slipman CW et al., 2003*).

The first pulsed radiofrequency procedure—on a lumbar dorsal root ganglion, took place on February 1, 1996, Since then, there had been reports that it has been successfully used for the treatment of myriad pain conditions, including cervical radicular pain, facial pain including trigeminal neuralgia (TN), sacroiliac joint pain, facet arthropathy, shoulder pain, postsurgical pain, radicular pain, groin pain, and myofascial pain conditions (*Cohen SP, Van Zundert J 2010*).

Aim of The Work

A comparative study between the therapeutic benefit of either facet joint injection block and pulsed radiofrequency neurotomy in the management of chronic low back pain in non surgical patients.

Introduction

The vertebral column normally consists of 24 separate bony vertebrae, together with 5 fused vertebrae that form the sacrum, and usually 4 fused vertebrae that form the coccyx (*Alison Middleditch & Jean Oliver, 2005*).

It is not unusual for variations to occur, particularly at the lumbosacral junction where the first sacral segment may exist as a separate vertebra, lumbarization of the first sacral vertebra, Sacralization of the fifth lumbar vertebra is another variant, in which there is complete or incomplete incorporation of the fifth lumbar vertebra into the sacrum. Hemivertebrae and fused vertebrae may also occur (*Alison Middleditch & Jean Oliver, 2005*).

The vertebral column is composed of alternating vertebrae and intervertebral (IV) discs supported by robust spinal ligaments and muscles. All of these elements, bony, cartilaginous, ligamentous, and muscular, are essential to the structural integrity of the spine (*A. Rawls and R. E. Fisher 2010*).

The spine serves three vital functions:

- a) Protecting the spinal cord and spinal nerves,
 - b) Transmitting the weight of the body, and
 - c) Providing a flexible axis for movements of the head and the torso (*A. Rawls and R. E. Fisher 2010*)
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