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INTRADISCAL THERAPY FOR
TREATMENT OF
DEGENERATIVE DISC DISEASE

SUBMITTED FOR PARTIAL
FULFLLMENT OF M.Sc. DEGREE IN
ORTHOPEDIC SURGERY

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AIM OF ESSAY:

The aim of this essay is evaluation of the new advances in intradiscal therapy and its application as an alternative to open surgery including:
Indications, technique, results and possible complications.

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Abb.,.....	Page
NP.....Nucleus Pulposus.....	25
AF.....Annulus Fibrosus.....	25
IVD.....Intervertebral Disc.....	30
IVDD.....Intervertebral Disc Degeneration.....	30
SI.....Signal Intensity.....	55
HI.....Height Index.....	55
CN.....Chemonucleolysis.....	58
APD.....Automated Percutaneous Discectomy.....	58
IDET.....Intradiscal Electro-Thermal Therapy.....	76
BMP.....Bone Morphogenic Protein.....	87
IGF-1.....Insulin like Growth Factor-1.....	87
FGF.....Fibroblast Growth Factor.....	87
TGF-B.....Transforming Growth Factor-beta.....	89

Abstract

The search for an alternative method for treatment of degenerative lumbar disc disease has increased in the past decade.

Intradiscal therapy is a new term in management of chronic low back pain, including chemonucleolysis, laser nucleotomy, intradiscal electrothermal therapy (IDET) and disc regeneration procedures via gene therapy.

Intradiscal therapy is appealing because it is done as an outpatient procedure with local anaesthesia and no hospital stay. These procedures reduce soft tissue and bone injury. It reduces the risk of complications.

It may be the most efficient and cost effective procedure for management of contained symptomatic disc and chronic low back pain in the future.

KEY WORDS:

- *Low back pain.
- *Intradiscal therapy.
- *Chemonucleolysis.
- *Laser nucleotomy.
- *IDET.
- *Disc regeneration.
- *Gene therapy.

INTRODUCTION

Individuals with degenerated discs in the lower (lumbar) spine sometimes suffer from disabling, chronic low back pain. Most patients with symptomatic degenerative conditions in the spine are treated non surgically with anti-inflammatory medications, physical therapy and injections. Most of these individuals will favorably respond to non-surgical methods of treatment, but a subset of individuals will continue to experience pain.

The chronic nature of back pain often interferes with the ability to work and participate in regular daily activities. As a result, surgical treatment may become necessary. The classical surgical treatment for chronic disabling back pain, which is resistant to conservative treatment, has been spinal fusion. However, spinal fusion is not without complications whether in the short or long term.

Attempts of using minimally invasive techniques to alter the biophysical and possibly biochemical structure of the painful lumbar disc have been an attractive alternative.

Various techniques including: Chemonucleolysis, LASER Nucleotomy, Intra-Discal-Electro-Thermal therapy (IDET), Attempt disc regeneration have been & are continually evolving.

Chemonucleolysis have been described as an effective intradiscal therapy esp., in herniated nucleus pulposus. (*Alexander et al, 1992*)

Chemonucleolysis and LASER Nucleotomy is done by use fluoroscopic control to place the probe in the center of the disc. (*Sherk , 1993*)

Intradiscal Electrothermal Therapy (IDET) is designed to shrink and tighten the collagen fibers of the annulus fibrosis, the outer layers of the intervertebral disc, which are frequently torn or disrupted in the event of a disc protrusion. (*Saal, 1999*)

Most recently, disc regeneration researches via Intradiscal Gene Therapy and In-Situ Tissue Engineering of the Intervertebral Disc. Experimental evidence from in vitro and in vivo studies using a rabbit model will be presented, demonstrating efficient transduction of intervertebral disc cells and long-term transgene expression following adenovirus-mediated gene transfer.

Observations of increased matrix synthesis by intervertebral disc cells from rabbit discs injected with an adenoviral construct containing the cDNA of human transforming growth factor beta 1 suggest that "in-situ tissue engineering" of the intervertebral disc by this method. **(Gilbertson, 2000)**

Intradiscal techniques done as outpatient with use of local anesthetic and sedation so reduce surgical complications - reduce surgical blood loss - reduce use of post-operative narcotic pain medicines - avoidance of fusion disease and reduced length of hospital stay so increasing speed of functional return to daily activities. **(Saal, 1999)**