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Effectiveness of Treatments for Low Back Pain

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Abstract

- Low back pain with or without radiculopathy symptoms is increasingly becoming a common complaint for patients. The purpose of this study is to evaluate the most effective treatment for patients experiencing low back pain with or without radiculopathy symptoms with the goal of pain reduction/elimination and positive long term results. The review of literature explores studies that discuss treatment options of surgical intervention or conventional treatment such as physical therapy. This information supplies health care providers with the tools to educate patients on treatment options and possible outcomes in hopes to offer the best treatment for the individual. Results show that patients can have pain reduction or relief and return to normal activity level in a shorter time frame with treatment of conventional methods versus surgical interventions. The findings indicate treatment alternatives that may not have been considered as beneficial before. In addition, the findings may provide guidance to when a patient should be referred to a surgeon for treatment versus starting with physical therapy or other non-surgical treatment options. This information should help health care providers reduce a patient's low back pain and improve their quality of life.

Introduction

- Chronic low back pain is a common complaint among adult patients as prevalence has increased from 3.9% in 1992 to 10.2% in 2006.
- Even just two days per week of exercise therapy results in significant pain reduction and increased overall function (Rainville et al, 2002).
- It is thought that spinal fusion is the gold standard surgical treatment option.
- Patients often still have some continuation of pain along with additional risks associated with surgery such as infection and possible re-operation.
- "lumbar fusion was not superior to cognitive intervention and exercises at relieving symptoms, improving function and return to work at 4-years" (Brox et al., 2010, p.1647)
- According to Skold et al. (2013), at a five year follow up total disc replacement (TDR) appears superior to spinal fusion in pain reduction
- There is also the factor of significantly increased cost of treatment with a surgical option and longer time out of work for recovery for a patient to consider.

Statement of the Problem

- Low back pain with or without radiculopathy symptoms is increasingly becoming a common complaint for patients.

Research Question

Would patients have a better long term result with alternative therapy versus surgical intervention as treatment for low back pain with or without symptoms of radiculopathy?

Literature Review

- "Recent figures estimate that 7% to 14% of adults in the United States have some disability related to back pain, and 1% to 2% of the population are totally disabled by back pain at any given time" (McCance, 2010, p. 492).

PATHOPHYSIOLOGY OF LOW BACK PAIN AND RADICULOPATHY

- Pain that lasts at least three months is usually referred to as chronic pain.
- There are five mechanisms that have suggested for causing chronic pain:
 - 1) There may be changes in the sensitivity of neurons
 - 2) Regenerated peripheral nerves create spontaneous impulses
 - 3) There could be a reorganization of nociceptive neurons
 - 4) There could be a loss of pain inhibition at the spinal cord
 - 5) Chemokine's could be up-regulated
- Radiculopathies are created from damage to the spinal roots that emerge from the vertebral canal from mechanisms such as compression, infection, inflammation, ischemia or direct trauma (McCance, 2010)

ALTERNATE TREATMENT OPTIONS

- First step in low back pain treatment is using conservative methods such as physical therapy/exercise
- Treatment results with two-day or three-day therapy were statistically similar, which represents a significant potential cost savings of 20% and decrease in work time loss for patients

SURGICAL TREATMENT OPTIONS

- Lumbar fusion has been considered the gold standard surgical treatment for chronic low back pain patients
- A five year evaluation results post total disc replacement (TDR) versus lumbar fusion surgery for patients with chronic low back pain; Primary outcome assessment showed 38% in TDR group versus 15% in the fusion group reported being totally pain free (Skold et al, 2013).

COMPARISON OF SURGERY VERSUS NON-SURGICAL TREATMENT OPTIONS

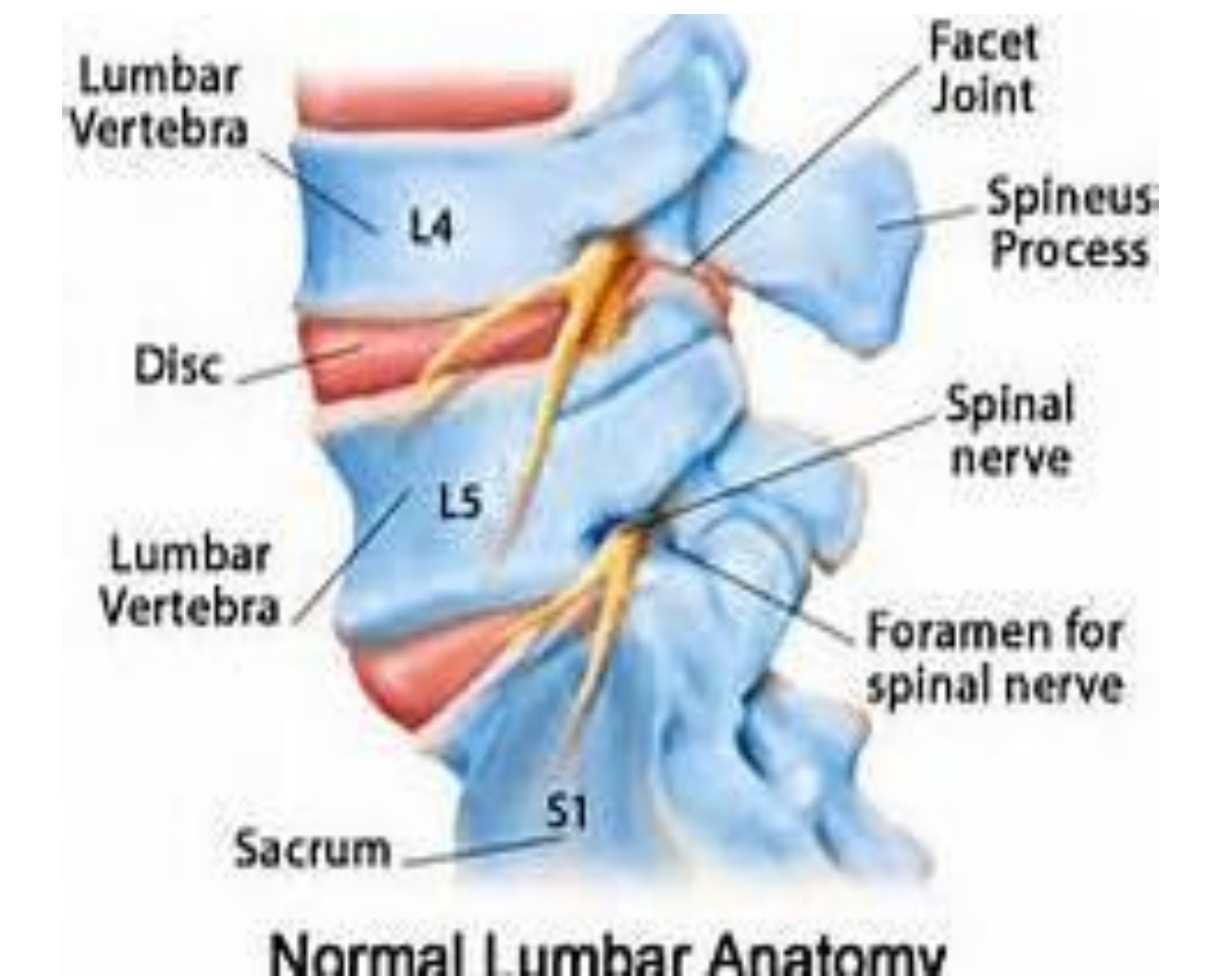
- "1 week plus 2 weeks in the outpatient clinic at the study centre interrupted by 2 weeks at home" (Brox et al., 2010, p.1643); to help patients realize that they could participate in activities of daily life without doing any harm to their back
- Lumbar fusion participants reported a score of 44.1 ± 10.7 at baseline and 29.7 ± 20.5 at four years; cognitive/exercise participants reported a score of 43.4 ± 11.1 at baseline and 27.0 ± 19.4 at four years (Brox et al, 2010)
- Lumbar discectomy vs. conservative treatment options in patients with low back and lumbar radicular syndrome showed: two months post treatment, the operative group reported 5.680 ± 2.838 and the non-operative group reported 11.00 ± 3.658 on the Sciatica Bothersome Index; 18 month follow up, the operative group reported 3.620 ± 2.570 and non-operative group reported 6.500 ± 3.737 (Hadzic et al., 2013).
- 11 year follow up of three multicenter randomized controlled trials showed no statistically reportable differences in treatment options at long term follow up (Mannion, 2013)
- Significant improvement was shown throughout both groups with the exception of fear-avoidance beliefs and fingertip-floor distance with the fusion group and lower limb pain in the cognitive/exercise group (Brox et al., 2003)
- Cost for surgery is significantly more than conservative treatment and does not appear to yield better results (Brox et al., 2003)
- Disc prosthesis vs. multidisciplinary rehabilitation data shows patients should be treated earlier than usual to reduce development of chronicity with therapeutic resistance (Hellem et al, 2012)
- Multidisciplinary rehabilitation should be attempted before disc replacement surgery becomes the treatment option (Hellem et al, 2012)

Discussion

- Spine rehabilitation - efficacious in reducing back pain, associated leg pain and resulted in lowered Oswestry back pain disability scale scores; improved trunk flexibility, trunk strength and the progressive isoinertial lifting evaluation (Rainville et al, 2002).
- Main advantage of the operative treatment happened in the two month post discectomy; improvement in the non-operative group was slower, but significant and persistent into the eighteen month follow-up (Hadzic et al, 2013).
- Associated radiculopathy symptoms improved only after the symptoms almost doubled within the first two months post-op compared to the non-operative group (Hadzic et al, 2013).
- Longer term evaluation, "lumbar fusion was not superior to cognitive intervention and exercises at relieving symptoms, improving function and return to work at 4-years" (Brox et al., 2010, p.1647).
- Fusion surgery (gold standard) to total disc replacement (TDR) patients also showed less disability, better patient satisfaction and lower consumption of analgesics at five year follow-up (Skold et al, 2013).
- Little evidence (level C) that patients with severe chronic low back pain and degenerative changes will have improvement with surgical treatment after failing to see improvement with conservative treatment.
- Level B evidence that functional disability improvement is similar for either surgical or non-surgical treatment option.
- Surgical vs. non-surgical treatment options, "50% to 60% of patients in each group reported that their back problem was better/much better and only about 40% of all patients had ODI scores in the range reported for "normal" populations" (Mannion et al., 2013, p.6).
- Lumbar instrumented fusion vs. cognitive intervention/exercise; All outcome measures showed significant improvement except on lower limb pain in the cognitive/exercise group and fear-avoidance and fingertip-floor distance in the spinal fusion group (Brox et al, 2003)
- Fear of pain with confrontation and avoidance behaviors; engage in activities of daily life and certain physical activities without doing harm to their back (Brox et al, 2003)
- Surgical patients to resume normal activity once their stitches are removed, maintaining core strength and mobility - very important component in chronic low back pain rehabilitation (Brox et al, 2003)
- Cost of lumbar fusion surgery is a considerable more expensive treatment option for no greatly measureable benefit (Brox et al, 2003)

Applicability to Clinical Practice

- Low back pain is a significant problem in healthcare today as it is the second most common cause of primary care visits, with an annual prevalence of 15-45% and annual cost of over \$50 billion in the United States (Papadakis, 2013).
- Concern and need for research comes for a couple of reasons:
 - 1) There is a need for clinicians to have proper information to guide them in the most appropriate treatment for these patients. Importance of good effort in first line rehabilitation therapy.
 - 2) It helps back providers up in explaining to patients that although this may take time and not be a quick fix, it has been proven to show improvement in pain level and overall function.
- Exercise therapy has level 2 evidence of support for being modestly effective in the improvement of function and pain for chronic low pain patients (DynaMed, 2014)
- Physical therapy with the STarT back screening tool is associated with level 2 evidence rating for reduced disability.
- Surgical options come with risks and concerns for patients.
- Very common for patients preoperatively to be concerned about what to expect for long term outcomes after surgery in comparison to conservative treatment options (Mannion et al, 2013)



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thanks . . .

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