



EFFECTIVENESS OF PHYSIOTHERAPY IN INFECTIVE LUMBAR SPONDYLODISCITIS: A CASE REPORT

Physiotherapy

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ABSTRACT

Background: Spondylodiscitis is the infection of spine which damage the spinal structures which is operated by the Spinal Fusion as condition presenting features of local percussion pain, fatigue, fever, growing biomechanical instability, epidural abscesses and Low back pain. **Objectives:** To evaluate the effect of Core stabilization exercise with neural mobilization on pain and Quality of Life in the patient with Lumbar spondylodiscitis. **Case Description:** A 54-year old male patient admitted to hospital for treatment of lumbar spondylodiscitis. He got operated by lumbar spinal fusion and shifted to the general ward for the further supervision and physiotherapy treatment. **Method:** The intervention protocol given to the patient for 4 weeks which includes reducing pain, improves muscle strength and endurance and functional status of patient. **Result:** The Core Stabilization exercise showed a remarkable effect on reduction of pain intensity plus improved Quality of Life. **Conclusion:** Study concluded that Core stabilization exercise reduce the pain and improve Quality of Life.

KEYWORDS

Spondylodiscitis, Lumbar spinal fusion, Low back pain, Core Stability exercise, Physical Therapy.

INTRODUCTION

Spondylodiscitis (SD) is infection of the spine which damage the intervertebral disc, vertebral body or posterior arch of the vertebra. Possible cause are pyogenic, tubercular and parasite infections.¹ The lumbar spine is most frequently affected followed by the thoracic and cervical spine.² Non-tuberculosis spondylodiscitis incidence has been calculated to be 2.2–2.4 cases per 1,00,000 person-years and it has been seen to be rising with the age of population.³ Patients with lumbar spondylodiscitis were found to have nonspecific presentation like local percussion pain, fatigue, fever, loss of appetite and exhaustion.⁴ In addition to clinical symptoms and radiographic findings, the diagnosis of spondylodiscitis is also based on blood cultures and laboratory tests such the erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP), particularly in individuals with intermittent or persistent high fever. Additionally, surgical biopsy is the most reliable and appropriate way to find the pathogen.⁴

Conservative treatment is successful for the majority of spondylodiscitis patients, but patients may require surgery due to growing biomechanical instability, epidural abscesses, deterioration of neurologic status and Low back pain.⁵ The spine is typically unstable after decompression, drainage and a sequestrectomy. So mechanical stabilization is required in form of surgery.² Decompression of the spine, eradication of infection, pain relief, correction of deformity and removal of infected tissues are the aim of surgery. Recent studies have also established the effectiveness of posterior pedicle screw instrumentation (PSI) and single-stage transforaminal lumbar interbody debridement and fusion (TLIF) for lumbar septic spondylodiscitis.³ There are few studies about the management of lumbar Spondylodiscitis employing Posterior lumbar inter-body fusion (PLIF) and pedicle screw fixation.⁵

Before lumbar spine fusion (LSF), patients with chronic low back pain experiences impairment, decreased physical activity and other problems with their lives. Rehabilitation following LSF should focus on restoring appropriate exercise routines that enhance physical functionality.⁶ In order to improve physical functioning, work abilities and quality of life, patients undergoing LSF surgery require more focused and intense trunk and total body muscle training.⁷ After LSF surgery, it's important to establish effective rehabilitation procedures to assist patients in managing their pain, regaining lost function and returning to their recreational sports.⁷ It is generally known that intra-abdominal pressure (IAP) improves lumbar spine function. IAP relieves strain on the lumbar spine and improves trunk stability when the abdominal muscles are co-activated.⁸

Case Description

A 54-year-old male patient admitted to the hospital for spine surgery as he was suffering from severe low back pain. Since 3 months with intervals of fever. He was diagnosed as lumbar spondylodiscitis as his

investigation such as X-ray and MRI shows infection at lumbar spine. During 3 months One day he lifted the heavy bedsheet and he suddenly felt pain at his low back which was increased than the previous days. He consulted a physician and took medications. Patient had a clinical features of low back pain, Radiating at right lower limb, Weakness of muscles and difficulties in walking and daily living activities. At hospital he underwent surgery of L4-L5 spinal fusion and removal of debridement. After surgery patient felt pain at the lumbar region which is radiate in right side leg. He was unable to sit and change his position, also had difficulty in ambulation. So patient referred for Physiotherapy.



Figure 1: MRI (infection at L4-L5 intervertebral disc)



Figure 2: X-ray (lumbar spinal fusion surgical procedure L4-L5 vertebra)

Therapeutic Intervention

Week	Exercise	Exercise description	Dosage
Week 1	Patient education	Educate the patient about his condition and further treatment.	Day 1
	Isometric exercises	By maintaining the lumbar spine's neutral position. Isometric back & abdominal exercise.	10 sec hold 10 repetition
	Core stabilization exercise	Crook lying. Hold the drawing-in maneuver 10 seconds, rest 10 seconds.	10 repetition
Week 2	AROM exercise	Hip & Trunk AROM	10 sec hold 10 repetition
	Abdominal draw-in maneuver	Patient inhales through the mouth for 5 s to expand the abdomen to the maximal level, minimizing movement of the thorax, performs a long exhalation to maintain a lower abdominal contraction.(Supine)	10-15 repetition
	Stretching	Stretching of Back extensors Flexors muscle (Cobra pose) Hamstrings muscle.	20 sec hold 3 repetition
	Core stabilization exercise	Stand and hold the drawing-in maneuver and contract the lumbar paraspinal muscles during walking and daily activities.	10 repetition
Week 3	Lumbar spine stabilization exercise	Curl up, dead bug, bridge and side plank with knee flexion.	20 sec hold 10 repetition
	Respiratory resistance	Expand a lung allows control of ventilation during inhalation and exhalation to strengthen respiratory muscles.	10 repetition
	Myofascial release	Thoracolumbar fascia. Counter pressure was applied by 1 hand while the other hand applied a slow stretch in the opposite direction until a tissue barrier was felt & sustained pressure was applied.	2-3 minutes
	Core stabilization exercise	Drawing-in maneuver with bridging(both knee flexed) Progression bridging (one knee extended)	10 repetition
Week 4	Core Stabilization exercise	1. Bird dog exercise 2. Squatting with drawing-in maneuver.	10 repetition
	Neural Mobilization	Right leg raise 35° which cause traction on the sciatic nerve with ankle toe movements.	10-15 repetition
	High load exercise	Upper and lower limb exercise with resistance of elastic band.	10 repetition

Outcomes Measures

1. Numerical Pain Rating Scale (NPRS)
2. Roland-Morris Disability Questionnaire (RMDQ)
3. Manual muscle testing (MMT)

RESULT

Outcome measures	Baseline Score	1st week	2nd week	3rd week	4th week
NPRS	8	6	4	3	1
RMDQ	22	17	13	8	3
MMT Rectus abdominis	2	-	3	4	5
Multifidus & erector spinae	2	-	3	4	5
Transverse oblique	3	-	4	4	5

DISCUSSION

In this present case report, physical therapy treatment with emphasis on manual therapy achieved satisfactory results in a patient with

Lumbar spine fusion in Lumbar Spondylodiscitis. Unfortunately, The treatment strategy was to reduce pain, improve stability of the lumbar spine, strengthening of the lower limbs and improve functional capacity.

A simple strategy to protect the back and spinal structures is to maintain proper posture. Abdominal bracing exercise is one of the most efficient strategies to increase the activation of deep abdominal muscles, such as the internal oblique muscle.⁹ Core stability exercise increase the abdominal and back extensors muscle strength and improve the lumbar spine stability.¹⁰ Following LSF, MFR may reduce pain, It results in changes in cell morphology, reorientation of fibroblasts, reduction of fascial restrictions, improvement of the normative length and elasticity of the fascial tissue, stimulation of afferent pathways and activation of descending pain inhibiting systems, which can modulate pain.⁷ The diaphragm and deep abdominal muscles contract strongly as a result of the forced breathing caused by the resistance to airflow during respiration. The respiratory resistance exercised by the respiratory with resistance raised the load on the synergist muscles and the diaphragm, which helped to enhance muscle strength and endurance.¹¹ Early initiation of a postoperative rehabilitation program based on strength training principles supporting IAP utilization for trunk stabilization after LSF is safe, effective and enable earlier functional recovery than standard rehabilitation protocol, proven by DejanKernc et al.⁸ Previous studies have concluded that core stabilization exercise have shown positive results in enhancing the core and lower limb muscle strengthening and improving disability score.^{4,7} One previous study discussed about A strong contraction of the diaphragm and abdominal deep muscles through respiratory resistance is believed to increase the pressure in the abdominal cavity. In particular, the pressure on the lumbar spine was reduced in the vertical direction, making postural adjustment easier.¹¹ Mohsen Mohamed Elsayyad et al concluded that Patients who received Neural Mobilization or Myofascial Release combined with Stabilization Exercise demonstrated better improvement after LSF.⁹ Outilivesa, Marko H. Neva et al in their study concluded that back-specific exercise combined with walking seems to be equally effective as usual care in improving trunk muscle strength in LSF patients.⁶

CONCLUSION

This study found that the use of physiotherapy approach in the treatment of infective lumbar spondylodiscitis increases muscular strength and endurance, lessens discomfort and has a good impact on spine stability which reduce the pain and improve the quality of life of the patient.

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