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POST-OPERATIVE MANAGEMENT FOR PATIENT WITH VERTIBROPLASTY- A CASE REPORT

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ABSTRACT-
INTRODUCTION- Many lumbar fractures are caused by osteoporosis, especially in postmenopausal women. A lumbar compression fracture, whether brought on by trauma or osteoporosis, is a dangerous condition. We report the case of a patient who underwent vertebroplasty for a burst compression fracture at L1 and L5, and who was treated according to a predetermined protocol for patients undergoing post-operative spine rehab—kyphoplasty/vertebroplasty treatment guidelines.
CASE PRESENTATION- A 78-year-old woman complained of acute, escalating low back pain that did not go away with rest or medicine for the previous two months. The patient also experienced tingling and numbness in the affected area. An MRI and X-ray were recommended for the patient, and the results showed multiple grade 3 III fractures of L1 and L5, grade II anterolisthesis of L5 over S1, and a complete fracture of D12.
CONCLUSION- There were numerous benefits to the vertebroplasty treatment protocol, which was also proven to be helpful in treating patients. Although the approach is less well-known, the results show that it is rather effective.

INTRODUCTION

Many lumbar fractures are caused by osteoporosis, especially in postmenopausal women. A lumbar compression fracture, whether brought on by trauma or osteoporosis, is a dangerous condition.[1] We report the case of a patient who underwent vertebroplasty for a burst compression fracture at L1 and L5, and who was treated according to a predetermined protocol for patients undergoing post-operative spine rehab—kyphoplasty/vertebroplasty treatment guidelines. [2,3]

CASE PRESENTATION

A 78-year-old woman complained of acute, worsening low back pain that did not go away with rest or medicine for two months. She also experienced tingling and numbness in the same area. The patient was advised to undergo an MRI and an X-ray. Grade II wedging fractures of the body, anterior part of the L1 vertebra, and posterior section of the L5 vertebra were found on the MRI. L5 anteriolisthesis over S1 vertebra, grade II. Additionally, a full grade III collapse of the D9 vertebra's body is observed, along with an aberrant T2/STIR hyperintensity within it. Additionally, in the C4-C5, C5-C6, and C6-

C7 vertebral levels, lower intervertebral height is associated with cervical lordosis loss. A cautious management trial would be counterproductive for the patient. The following surgical procedure was done on the patient:

- L4 vertebroplasty as a first step, followed by temporary L3–L5 pedicle screw fixation as a second operation, if the pain remained incapacitating and/or if any neurological symptoms occurred with mobilization.

The goal of surgery was to provide sufficient anterior spinal structural support, as measured by pain and/or neurological symptoms with mobilization, until the expected L4 fracture healing. The patient reported minimal residual pain immediately after the surgery.
The physiotherapy intervention was pre decided to check the effect in the patient. [3-6] It includes-

Phase I: Immediate post -Surgical Phase (IPSP) 0-2 weeks:

1. Education on bed mobility and transfers with proper spine positioning.
2. Reinforce basic post-op home exercise program including a. Ankle pumps b. long arc and short arc quadriceps c. Diaphragmatic breathing d. Relaxation exercises e. Abdominal isometric exercises
3. Increase tolerance to walking to ½ mile daily (15-30 min cardiovascular activity) 4. Reinforce sitting, standing and ADL modifications with neutral spine and proper body mechanics.

Criteria for progression:

1. Pain and swelling within tolerance.
2. Independent HEP
3. Tolerance of 15 min of exercise and 15-30 min of cardiovascular exercise.
4. Functional ADL for self -care/hygiene

Phase II: Initiation of OP-PT 2-4 weeks/2-3 times per week:

1. Manual Therapy:

- Grade 1 or grade 2 joint mobs for neuromodulation of pain
- Scar tissue mobilization. Educate patient on self- mobilization of scar.

2. Exercises:

- Train Neutral lumbar position: Create independent movement of the pelvis and then find and maintain a neutral position of the lumbar spine.
- Diaphragmatic breathing: Proper breathing technique without the use of accessory respiratory muscles.

3. Knee strengthening exercises.
4. Unloaded trunk ROM exercises: Lumbar spine flexion and extension in quadruped (cat camel)Pelvic rocks/ Wig wags/ Pelvic clocks.
5. Hip and knee flexibility exercises: Decreases stress on lumbar spine and makes it easier to maintain neutral spine.
6. Initiate aquatics (if available and indicated).
7. Initiate balance exercises sitting and standing. Progress double leg firm surface to foam surface, eyes open/closed, single leg balance, reaching outside BOS.
8. Gait training with or without assistive device as needed.
9. Address other mechanical restrictions as needed.
10. Modalities for symptom modulation if needed.

Criteria for progression:

1. Patient has working knowledge of body and lifting mechanics.
2. Cardiovascular tolerance to 30 min/day
3. Dynamic sitting and standing tolerance of 15-30 min

Phase III: Advanced PT 4-8 weeks/2-3 times per week:

1. Activity specific training
2. Exercises (Advanced strengthening); (based on degree of bone loss, age and functional status of the individual)

- Increasing complexity and load of exercises maintaining lumbar spine stability: supine SLR all directions, single leg bridging, bridging on unsteady surfaces, alternate arm an leg extensions in quadruped, prone on ball leg and arm extensions (quadruped), functional co-contractions during walking increasing speed and other activities (kneeling, squatting, stairs etc)

3. Advanced Hip/Core strengthening exercises: Functional exercises like chops/diagonal lifts, squatting, lunging.
4. Lifting training with proper posture. (floor to waist and waist to shoulder level).

Criteria for discharge:

1. Manual muscle testing is within functional limits
2. Independent with gym program
3. Trunk ROM within functional limits

Pearls of rehab:

1. Exercises to avoid with Osteoporosis:

o Dynamic abdominal exercises (e.g. sit ups)
o Twisting movements (e.g. golf swing)
o Trunk flexion
o Abrupt or explosive loading
o High impact loading.

2. Avoid preloading the spine in posterior pelvic tilt.
3. Avoid prone upper body extensions, or prone leg extensions to avoid high compressive load of the already weakened spine)
4. No-pain no gain axiom usually does not apply to the spine
5. Because of diurnal variations in fluid level of the intervertebral disks (more hydrated early morning) it would be unwise to perform full range spinal motions (bending) shortly after rising from the bed
6. Focus on low load high repetitions to improve endurance rather than high load low repetition for strength.
7. There is some evidence that low back exercises are most beneficial when performed daily.
8. Focus on pain relief with Oswestry scores of 40-60, with scores of 20-40 focus on decreasing pain, muscle re-education, gradual strengthening, flexibility and improve cardiovascular endurance, with scores less than 20 focus on work simulation and progressive strengthening.

FIGURE 1 Pre operative MRI imaging of spine

FIGURE 2 shows pre operative T1 SAG

FIGURE 3 anteroposterior and lateral radiographs.

FIGURE 4 shows wedging fractures of the body, anterior part of the L1 vertebra , and posterior section of the L5 vertebra.

DISCUSSION

An anterior retroperitoneal route is the best choice when spinal canal decompression is sought, although it needs an access surgeon and may have a high morbidity rate.[7] Previous research highlighted the significance of anterior support for unstable fractures.[8]

To minimize morbidity, posterior approaches have been described to achieve both the lumbar corpectomy and the posterior fixation.[9]. Several articles have described the use of standalone vertebroplasty for the treatment of lumbar fractures. [10-12]. L4 vertebroplasty as a first step, followed by temporary L3–L5 pedicle screw fixation as a second operation, if the pain remained incapacitating and/or if any neurological symptoms occurred with mobilization was the surgical procedure performed in the patient.

In our case, we used the pre- decided protocol of post operative vertebroplasty which was mentioned by Advanced Orthopaedics and Sports Medicine Post operative Spine Rehab-Kyphoplasty/Vertebroplasty Treatment Guideline. This protocol is not mentioned to be used in any of such cases. This protocol showed good results in patient till discharge and post discharge ergonomics and exercise were given to patient. Follow-up after 1 month was taken to see further result in the patient. And the patient was satisfied with the previous and till date treatment.

CONCLUSION

We report the case of a patient who underwent vertebroplasty for a burst compression fracture at L1 and L5, and who was treated according to a predetermined protocol for patients undergoing post-operative spine rehab—kyphoplasty/vertebroplasty treatment guidelines. The protocol found to be very effective in the patient with no adverse effect on patient's condition.

CONSENT

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

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