PERCUTANOUS VERTEBROPLASTY FOR VERTEBRAL COMPRESSION FRACTURE IN GERIATRIC PATIENTS; A REPORT OF TWO CASES

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ABSTRACT

BACKGROUND:
Osteoporotic vertebral fractures are common in the geriatric age group. Treatment options are influenced by the severity of symptoms, the presence or otherwise of spinal cord compression, level of spinal compression, degree of vertebral height collapse and the integrity of the posterior spinal elements.

AIM:
We report vertebroplasty for compression vertebral fractures in two geriatric patients.

CASE REPORT 1:
A 94 year old widow presented to our accident and emergency unit with seven hour history of severe localized back pain following trauma. No neurologic deficit. Radiologic evaluation showed compression fracture of the twelfth thoracic vertebra with intact posterior elements. She had T12vertebroplasty using an injectable non-resorbable, vertebroplasty cement the day after the injury. Immediate post operative and three months follow-up reviews showed effective pain relief and progressive independent ambulation.

CASE REPORT 2:
A 73 year old with sudden onset back pain following trauma. She subsequently had percutanous L1 vertebroplasty after evaluation. Post operative pain relief was significant with a VAS score of -4.0 on day one and -8.0 on day seven.

CONCLUSION:
Percutanous vertebroplasty offers effective, immediate and sustained pain relief in osteoporotic vertebral fractures.

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INTRODUCTION

Osteoporotic vertebral body fractures are common in the geriatric age group[1]. Symptoms could range from mild backache to complete loss of neurologic functions to the area below the spinal level of the injury[2]. Surgical options are influenced by the severity of symptoms, the presence or otherwise of spinal canal compression, level of spinal compression, degree of vertebral height collapse and the integrity of the posterior spinal elements[3].

We report vertebroplasty of the twelfth thoracic vertebrae for compression fracture in two geriatric patients.

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CASE SUMMARY 1:
Mrs. I.H; a 94-year old widow, slipped off the floor and fell in her sitting room, making direct impact with the buttocks. Following this incident, she developed pain in the back, which was severe, localized, aggravated by attempts to ambulate and relieved by rest (with a score of 8/10 on the Visual Analog Scale). She had no weakness in the lower limbs and no loss of sensation. There was no pain in either hips, no wound at the site of impact and no injury to the chest and the upper limbs. Ambulation after the incident was limited by marked pain in the back.

She was brought to our emergency room seven hours after the incident in an ambulance.

Primary survey at presentation revealed an uncompromised airway, no cervical spine tenderness. Her respiratory rate was 18cpm with no area of tenderness on the chest wall and equal air entry. Pulse rate was 80bpm, good volume but irregularly irregular. Blood pressure was 167/84mmg. She was fully

conscious and well oriented in time, place and person. She however exhibited occasional sigs of dementia reminiscent of her age.

There was marked tenderness on palpation and percussion, localized to T_{11} – L_1 vertebral region but no neurologic deficit and no signs of radiculopathy. Evaluation of the other systems was unremarkable.

Plain radiograph of the thoraco-lumbar spine showed a compression fracture of the twelfth thoracic vertebral body with minimal vertebral collapse. Non contrast magnetic resonance imaging of the thoraco-lumbar spine demonstrated burst fracture of T_{12} with intact posterior spinal elements.

The severity of her symptoms and the unacceptable risks associated with prolonged immobilization necessitated the decision for surgical intervention. Options of surgical treatment were discussed with the patient and relatives. The expected reduced post-operative morbidity, short operating time, brief post-operative hospital stay, effective pain relief and the less invasive nature prompted the choice of percutaneous vertebroplasty.

She had T_{12}vertebroplasty using an injectable non-resorbable, vertebroplasty cement the day after the injury. We gained entrance into the vertebra body through a T_{12} unipedicular approach using the trochar of a 18-gauge bone marrow aspiration needle under image intensifier guidance. We injected in 2ml aliquots until the vertebral space was fully occupied with cement without spillage into the spinal canal posteriorly or unto the aortic area anteriorly. A total of 12mls of cement was injected.

She ambulated with a walking frame six (6) hours post-surgery. Post-operative pain was minimal (Visual Analog Score of 2). She was discharged home on the second post-operative day with a thoraco-lumbo-sacral orthosis (TLSO), oral analgesics and monthly ibandronate medications.

Outpatient review on one week, six weeks and three months follow-up visits progressive reduction in pain (VAS of 1 at 3-months visit) and more independent ambulation.

CASE SUMMARY 2:

Mrs. M.H. 73 years old widow, was brought into the emergency unit at 2:40pm on the 4th March 2015 with complains of sudden onset low back pain following a fall in her bathroom 18hours prior to presentation. She slipped off a tiled floor and made impact with her buttocks. Pain was severe, localized to her lower back and was worsened by ambulation and relieved by rest. She had no weakness in both lower limbs; ambulation however was grossly impaired by the back pain.

Mrs. M.H previously had recurrent episodes of radiculopathic low back pain associated with weakness in both lower limbs for which she had spinal decompression surgery in a private hospital in the United Arab Emirates six months prior to onset of current symptoms. She had good recovery after the spine surgery.

She is a known diabetic-hypertensive with good control of both blood sugar and blood pressure.

On clinical examination, she was in painful distress with visual analogue score of 9/10 but otherwise stable. She had marked tenderness localized to the T_{11} to L_2 region. Motor and sensory functions in both Lower Limbs were intact. There was no abnormality in the chest, breasts, abdomen and rectum.

Plain radiography of the lumbosacral spine revealed a compression fracture of the L_1 vertebrae with a sclerotic lesion on the body of L_1 vertebrae. Non-contract magnetic resonance imaging of the lumbar spine showed a burst osteoporotic fracture of the L_1 vertebrae with intact posterior elements.

No abnormalities where found from abdomino-pelvic Ultrasound Scan and radiograph of the chest.

She subsequently had L_1 vertebral body core needle biopsy and percutaneous vertebroplasty.

In prone position, with light sedation and under c-am guidance, the L_1 vertebral body was approached with a size 18G bone marrow aspiration needle via the trans-pedicular route. Core tissue biopsy was obtained from the densely appearing portion of the L_1 vertebral body. A total of 18mls of vertebroplasty cement was injected in 2mls aliquots to fill up available space within the vertebrae while avoiding spillage into the spinal canal posteriorly and the aortic area anteriorly. To prolong the setting time of the cement, we stored the vertebroplasty cement at 40c for 24hours. Post-operative medications include:

- IV ketorolac 30mg 8hr for 24hr
- IV paracetamol 600mg 8hr for 24hrs
- Tab ibandonate 150mg monthly

She was ambulated with a walking frame 12hr post-surgery with much relief (VAS=5/10). By the first post-operative day, she could ambulate without support (VAS=3/10).

She was discharged home on the second post-operative day.

Follow-up review on the 8th day post-surgery revealed significant pain relief (VAS=1/10), independent ambulation and stable medical state. The histology result showed no pathologic lesion. Subsequent reviews at 6weeks and 3 months follow-up visits showed progressive reduction in pain.

Figures I, II, III

DISCUSSION:

Fixation of osteoporotic vertebral fractures is a challenge to spine surgeons. The anterior retroperitoneal approach which is best employed when spinal canal decompression is desired is associated with significant post-operative morbidity longer operating time and prolonged hospitalization[4].

Posterior approaches minimize this morbidity but have the challenge of a stable screw bar fixation and the risk of spinal canal penetration.

Vertebroplasty combines the advantage of effective pain relief and minimal post-operative morbidity. The VERTOS II study[5], an open labeled randomized trial on vertebroplasty versus conservative treatment in acute osteoporotic vertebral compression fractures showed effective immediate and sustained pain relief in the vertebroplasty group (with VAS score difference of -2.5 over a month period).

Our patients showed significant pain relief with VAS score deficit of -6.0 in one day and -7.0 in one week for the first patient and -4.0 in one day and -8.0 in one week for the second patient. Both patients also commenced ambulation within 12 hours of surgery (with minimal pain).

Possible complications include; allergic reaction to cement, rib fractures, cement pulmonary embolism, infection, radiculopathy and spinal cord compression6. Our patients did not have any of these complications.

CONCLUSION:

Percutaneous vertebroplasty offers effective, immediate and sustained pain relief in osteoporotic vertebral fractures. It also allows early ambulation, reduced hospital stay and minimal morbidity, which makes it quite suitable in geriatric patients.

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