

# KYPHOPLASTY IN ACUTE OSTEOPOROTIC DORSOLUMBAR FRACTURES

Thesis

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By

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#### **ABSTRACT**

SEVERAL TECHNIQUES HAVE BEEN DEVELOPED FOR KYPHOSIS TO OSTEOPOROTIC VERTEBRAL SECONDARY COMPRESSION FRACTURES DURING THE LAST 2 DECADES. TECHNIQUES OF VERTEBRAL BODY AUGMENTATION HAVE BEEN DEVELOPED IN AN EFFORT TO TREAT THESE REFRACTORY CASES. THE HIGH PRESSURE INJECTION OF LOW VISCOSITY OF (PMMA) HAS POTENTIAL RISK FOR **NEURAL COMPROMISE** AND PULMONARY **EMBOLISM** UNCONTROLLED LEAKAGE. THEREFORE, BALLOON KYPHOPLASTY AND VERTEBROPLASTY USING A LARGE CANNULA LOW PRESSURE INJECTION OF PMMA IN A HIGH VISCOSITY STATE HAS BEEN INTRODUCED. PERCUTANEOUS KYPHOPLASTY (PKP) IS A RECENTLY DEVELOPED, MINIMALLY INVASIVE SURGICAL TREATMENT FOR OVCF. COMPLICATIONS FOR BALLOON KYPHOPLASTY INCLUDE NON-TARGET PMMA EMBOLIZATION, ADJACENT VERTEBRAL BODY OR FRACTURE AND INFECTION.

KEY WORDS: VERTEBRAL BODY, COMPRESSION FRACTURES, PMMA, KYPHOSIS, PERCUTANEOUS KYPHOPLASTY.

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# Dedication

To my father, for guiding me with wisdom, support, love and whose skills in parenting induced the discipline necessary to take on the monumental task of writing and editing this essay.

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#### **LIST OF ABBREVIATIONS**

**ADL** Activities of daily living

**AS** Ambulatory status

**atm** atmospheric pressure

**BKP** Balloon kyphoplasty

**BMD** Bone mineral density

**CT** Computed tomography

**DEXA** Dual energy absorptometry

**FDA** Food and drug administration

**FU** Follow-up

**IBT** Inflatable balloon tamps

**IVD** Intervertebral disc

MRI Magnetic resonance imaging

**ODI** Oswestry disability index

**OVCFs** Osteoporotic vertebral compression fractures.

**P/Y** Person / year

**PKP** Percutaneous balloon kyphoplasty

**PMMA** Polymethylemethacrylate

**PSI** Pound/ (inch)<sup>2</sup>

**ROM** Range of movement

**RTA** Road traffic accident

**SLR** Straight leg raising test

STIR Short T1 inversion recovery

VAS Visual analogue scale

**VCFs** Vertebral compression fractures.

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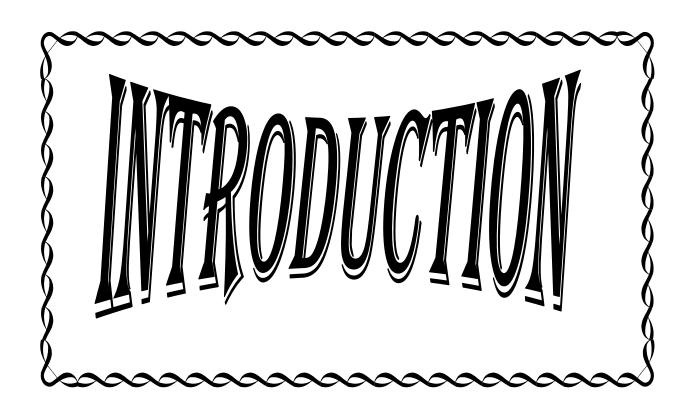
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#### **Introduction**

Osteoporosis Foundation The National has estimated that 100 million people worldwide are at a risk for the more than development of fractures secondary to osteoporosis. Osteoporotic Vertebral compression fractures (OVCFs) constitute a major health care problem in western countries, not only because of the high incidence of these lesions but also due to their direct and indirect negative consequences for patient health-related quality of life and the costs to the health care system. (1)

Compression fractures lead to a loss of height of the vertebral segment, and the resulting spinal deformity can lead to a decrease in pulmonary capacity, malnutrition, decreased mobility, and depression. **Kyphosis** secondary osteoporotic vertebral to compression fractures is associated with a (2) to (3) times greater incidence of death due to pulmonary causes. Although treatment of an osteoporotic vertebral compression fracture consists of bed rest, analgesics, and bracing, some fractures go on to progressive deformity and debilitating pain. (2, 3)

Several techniques have been developed for simpler and safer procedures during the last 2 decades. Techniques of vertebral body augmentation have been developed in an effort to treat these refractory cases. (4)

The high pressure injection of low viscosity of (PMMA) has potential risk for neural compromise and pulmonary embolism by uncontrolled leakage. Therefore, balloon kyphoplasty and vertebroplasty using a large cannula low pressure injection of PMMA

high viscosity been introduced. in state has Percutaneous a kyphoplasty (PKP) is recently developed, minimally a invasive surgical treatment for OVCF. (4)

with acrylic cement (PMMA) is a procedure aimed at collapse preventing vertebral body and pain in patients pathologic vertebral bodies. PKP is a promising therapeutic technique for pain control in patients with bone failure. PKP for OVCFs is typically performed by delivering double balloons via a bilateral or balloons inflated unilateral transpedicular approach; are for elevating simultaneously the end plate for accompanying vertebral body height balanced restoration. The deformity purportedly corrected by the insertion and expansion of a balloon in a fractured vertebral body. (5)

After reduction of the fracture bone, cement is then deposited into the cavity created by the balloon to repair the fracture. Good clinical outcomes as well as restoration of vertebral body height have been reported with kyphoplasty. Absolute contraindications to any vertebral augmentation procedure include asymptomatic osteoporotic vertebral compression fractures, ongoing local or systemic infection, uncorrectable coagulopathy, or improving pain on medical therapy. Fractures of the posterior elements (without vertebral body fracture) are another absolute contraindication. (5, 6, 7)

Complications for balloon kyphoplasty include non-target PMMA embolization, adjacent vertebral body or rib Fracture and infection. (8)