Journal of Experimental and Clinical Medicine
https://dergipark.org.tr/omujecm

Case Report

J. Exp. Clin. Med., 2018; 35(1): 23-25
doi: 10.5835/jecm.omu.35.01.005

Kyphoplasty for osteoporotic fractures: Experience of a single center

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ARTICLE INFO

Article History
Received 30 / 11 / 2015
Accepted 06 / 02 / 2016
Online Published Date 25 / 10 / 2019

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Keywords:
Intervention
Kyphoplasty
Osteoporosis
Spinal fracture

ABSTRACT

Osteoporosis increases the risk of spontaneous fractures of skeleton by enhancing the microstructure of the bones. Kyphoplasty is preferred for decreasing the pain and disability in treatment of spinal fractures. We aimed to report our clinical experience in kyphoplasty for spinal fracture treatment and to express a brief literature review. We performed balloon kyphoplasty in 14 patients with osteoporotic spinal fractures between January 2012 and July 2015. Nine of the patients were women and 5 were men. Age of the patients ranged between 59 to 81 years. We think that spinal fractures should be initially treated with conventional methods, however, kyphoplasty should be done without a delay because it is very effective in pain and other complications of the fracture and a relatively safer method than other interventions.

1. Introduction

Osteoporosis increases the risk of spontaneous fractures of skeleton by enhancing the microstructure of the bones (Peck et al., 1993). Although it is more prevalent in postmenopausal women (Khuwaja et al., 2005; Spencer, 2007), osteoporotic fractures could be more troublesome in elderly men compared to age matched women (Kellie and Brody, 1990; Melton et al., 1992). Spinal fractures are disabling complications of osteoporosis. It may cause pulmonary dysfunction, nutritional problems and pain (Garfin et al., 2001). Its prevalence in postmenopausal women has been estimated about 16% (Galibert et al., 1987). Surgeons prefer Kyphoplasty for decreasing the pain and disability in treatment of spinal fractures (Garfin et al., 2001).

In present case series, we aimed to report our clinical experience in kyphoplasty for spinal fracture treatment and to express a brief literature review.

2. Cases

We performed balloon kyphoplasty in 14 patients with osteoporotic spinal fractures between January 2012 and July 2015. Nine of the patients were women and 5 were men. Age of the patients ranged between 59 to 81 years. All patients have been previously diagnosed

with osteoporosis in internal medicine clinics of our institution. Radiologic images (MRI and CT) obtained from all patients before procedure. Three of the patients had T12 fracture while others had lumbar fractures in different levels. All patients with mild to moderate pain have been advised for conventional procedures for at least 3 months before surgery decision. Early surgery considered in patients with either following conditions: serious pain that cause malfunction, necessity of high dose analgesic for pain relief, acute severe wedging or progressive vertebral collapse. We performed kyphoplasty under general anesthesia in all cases. Patients located on prone position on operating table. After a small incision made, a narrow tube placed through fractured area under the guidance of fluoroscopy. We placed special balloon through the tube into the vertebrae and inflated it for returning the pieces into more normal position. After that, we filled the cavity with polymethylmethacrylate, a special cement. There were no complications related to the surgical procedure in postoperative period. Only two patients needed re-operation with kyphoplasty; one after a month and the other one after 2 years from the first operation due to fracture of upper level fracture. None of the patients described problems related to surgery in follow up period.

3. Discussion

Spinal fractures associated with osteoporosis have important morbidity and mortality (Buchbinder et al., 2009). About a quarter of population over 50 years of age will have suffer from spinal fracture in their life (Jones et al., 1996). Currently, standard care for spinal compression fractures include, pain medication, brace immobilization, progressive mobilization, and time. Compression fractures have a high rate of success in terms of healing although it may take a while (about three months). Generally, most clinicians will wait to see if the fracture will heal on its own. Surgical interventions; such as vertebroplasty and kyphoplasty may yield important improvement in pain and debility especially in patients whom not respond to conventional approaches (Buchbinder et al., 2009). These two minimal invasive interventions are generally performed in cases with severe, disabling pain after spinal fracture, in particular, when conventional measurements (pain medication, brace immobilization, bed rest) failed to relieve symptoms. Literature data suggest they are effective interventions especially in relieving pain (Ploeg et al., 2006). Kyphoplasty have been introduced as successful as open surgery and it have been provided a shorter hospital stay in vertebral fractures (Fuentes et al., 2010). Kyphoplasty could be used as a safe and effective method in treatment of spinal fractures in cases with true indicaitons and with standardized procedure (Huber et al., 2009).

The goals of a kyphoplasty should be listed as follows: relief of the pain caused by a spinal fracture, stabilization of the vertebrae, and maintenance of vertebral body height. Indications of kyphoplasty are spinal hemangiomas, osteoporotic or meatastatic spinal fracture. A relative indication for kyphoplasty could be that prophylactic augmentation before development of pathological fracture or severe pain (Mut and Nader, 2008). All of the patients in present report reached required indications for kyphoplasty surgery. Cord compression, neurologic deficit, coagulation disorders, and vertebral burst fractures are some of the contraindications of kyphoplasty. None of the patients in our report had such contraindications.

Unfortunately, kyphoplasty is not an uncomplicated process. It carries a number of complications, included; anesthesia related complications, cord injury or nerve damage (due to malpositioned instruments), cement leakage, allergic reactions to the radiocontrast agents (Watts et al., 2001). Patients we reported here had not suffered from any of these complications.

It is controversial that whether kyphoplasty increase the risk of upper level spinal fracture. Some authors reported that rate of vertebral fracture increased after kyphoplasty especially within 2 months of the surgery (Fribourg et al., 2004). On the other hand, data from literature suggest that kyphoplasty reduce the risk of subsequent spinal fractures (Harrop et al., 2004). Two patients had been re-operated due to upper level spinal fracture in our case series; one a month and other two years after first intervention. We speculate that, upper level fracture should be a consequence of ongoing chronic course of osteoporosis rather than a complication of kyphoplasty.

Another serious, however luckily a rare complication of kyphoplasty is cement embolization in to veins that result in pulmonary embolization. This complication may lead severe morbidity and even death (Krueger et al., 2009). We have not reported such complication in our cases.

In conclusion, we think that spinal fractures should be initially treated with conventional methods, however, kyphoplasty should be done without a delay because it is very effective in treatment of pain and other complications of the fracture and a relatively safer method than other interventions.

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