Vertebroplasty: An Innovative Solution for Spinal Fractures.

Jingjing Wu*

Department of Pharmacy, Nanjing Medical University, China

Introduction

Vertebroplasty is a minimally invasive surgical procedure designed to stabilize and strengthen fractured vertebrae. It is primarily used to treat spinal fractures caused by osteoporosis, trauma, or tumors. By injecting bone cement into the fractured vertebra, vertebroplasty aims to alleviate pain, restore mobility, and improve the quality of life for patients suffering from vertebral compression fractures. This article explores the indications, procedure, benefits, and potential risks associated with vertebroplasty, offering a comprehensive overview of this innovative spinal surgery [1].

Vertebroplasty is a groundbreaking, minimally invasive procedure designed to treat vertebral compression fractures, which are often a result of osteoporosis, trauma, or spinal tumors. These fractures can cause severe pain and significantly impair mobility, leading to a reduced quality of life for affected individuals. Traditional treatments, such as bed rest, pain medication, and physical therapy, may not always provide sufficient relief. Vertebroplasty offers a promising alternative by stabilizing the fractured vertebra through the injection of bone cement, providing rapid pain relief and enabling patients to regain their mobility [2].

Since its introduction in the 1980s, vertebroplasty has revolutionized the management of vertebral compression fractures. The procedure involves the precise injection of polymethylmethacrylate (PMMA) bone cement into the collapsed vertebra under imaging guidance, such as fluoroscopy, ensuring accurate placement and optimal results. This technique not only strengthens the affected vertebra but also prevents further collapse and deformity of the spine [3].

In this article, we will explore the indications for vertebroplasty, the detailed procedure, its benefits, and potential risks. By understanding the various aspects of vertebroplasty, patients and healthcare providers can make informed decisions about this innovative treatment option, aiming to improve patient outcomes and enhance the overall quality of life for those suffering from vertebral compression fractures [4].

Vertebroplasty is typically indicated for patients with painful vertebral compression fractures that do not respond to conservative treatments such as bed rest, pain medication, or physical therapy. The most common causes of these fractures include:

Osteoporosis: A condition characterized by weakened bones, making them more susceptible to fractures. Osteoporosis is the leading cause of vertebral compression fractures in older adults. Trauma: High-impact injuries from falls, accidents, or sports can cause fractures in the vertebrae [5].

Spinal Tumors: Cancerous growths in the spine can weaken the vertebrae, leading to fractures. Multiple Myeloma: A type of blood cancer that affects the bones, increasing the risk of fractures. Vertebroplasty is performed under local or general anesthesia, depending on the patient's condition and the surgeon's preference [6].

The procedure typically involves the following steps: Preparation: The patient is positioned face down on the operating table. The area of the back where the fracture is located is cleaned and sterilized .Imaging Guidance: Fluoroscopy, a type of real-time X-ray, is used to guide the surgeon during the procedure .Needle Insertion: A hollow needle (trocar) is inserted through the skin and into the fractured vertebra [7].

The correct placement of the needle is confirmed using fluoroscopy. Cement Injection: Bone cement (polymethy methacrylate or PMMA) is injected through the needle into the vertebra. The cement quickly hardens, stabilizing the fracture and providing support to the vertebral column. Completion: Once the cement has hardened, the needle is removed, and a small bandage is applied to the insertion site. The entire procedure usually takes about one to two hours [8].

Vertebroplasty offers several significant benefits for patients with vertebral compression fractures: Pain Relief: Most patients experience significant pain relief shortly after the procedure, allowing them to reduce or eliminate the need for pain medications. Improved Mobility: By stabilizing the fractured vertebra, vertebroplasty helps restore mobility and allows patients to resume their daily activities. Quick Recovery: As a minimally invasive procedure, vertebroplasty typically requires a shorter recovery time compared to traditional open surgeries. Many patients can go home the same day or the following day [9].

Prevention of Further Fractures: By stabilizing the fractured vertebra, vertebroplasty helps prevent further collapse and deformity of the spine. While vertebroplasty is generally considered safe, it does carry some risks and potential complications: Infection: As with any surgical procedure, there is a risk of infection at the injection site. Bleeding: There may be minor bleeding at the needle insertion site. Nerve Damage: Although rare, there is a risk of nerve injury due to the needle or cement placement. Cement Leakage: The bone cement may leak out of the vertebra and into surrounding tissues,

***Correspondence to:** Jingjing Wu, L Department of Trauma, University Hospital Limerick, Ireland, Email: jingjing wu@12.com

***Received**: 21-Apr-2024, ManuscriptNo.AAOSR-24-138178;**Editorassigned:24**-Apr-2024,PreQCNo.AAOSR-24-138178(PQ);**Reviewed:**09-May-2024,QC No. AAOSR- 24- 138178; **Revised:** 14-May-2024, Manuscript No. AAOSR- 24- 138178 (R); **Published: 21-May-2024**, DOI: 10.35841/ aaosr-8.3.203*

***Citation:** Wu J. Vertebroplasty: An Innovative Solution for Spinal Fractures.J Ortho Sur Reh.2024; 8(3):203*

potentially causing complications. This risk is minimized with careful imaging guidance during the procedure. Allergic Reactions: Some patients may have allergic reactions to the bone cement or anaesthesia used during the procedure [10].

Conclusion

Vertebroplasty is a highly effective and minimally invasive procedure that offers significant benefits for patients suffering from vertebral compression fractures. By providing rapid pain relief, improving mobility, and stabilizing the spine, vertebroplasty enhances the quality of life for many individuals affected by osteoporosis, trauma, or spinal tumors. Despite its potential risks, vertebroplasty remains a valuable option for treating painful vertebral fractures that do not respond to conservative treatments. As with any medical procedure, patients should discuss the risks and benefits with their healthcare provider to determine if vertebroplasty is the right choice for their condition.

References

1. Shin D, Hong SJ, Lee KW et al. Pro-inflammatory diet associated with low back pain in adults aged 50 and older. Appl Nurs Res. 2022;66:151589.
2. Elma Ö, Yilmaz ST, Deliens T, et al. Nutritional factors in chronic musculoskeletal pain: unravelling the underlying mechanisms. Br J Anaesth. 2020 ;125(2):e231-3.
3. Krebs-Smith SM, Pannucci TE, Subar AF et al. Update of the healthy eating index: HEI-2015. J Acad Nutr Diet 2018 ;118(9):1591-602.
4. Khorsha F, Mirzababaei A, Togha M et al. Association of drinking water and migraine headache severity. J Clin Neurosci. 2020;77:81-4.
5. Hébert JR, Shivappa N, Wirth MD et al. Perspective: the Dietary Inflammatory Index (DII)—lessons learned, improvements made, and future directions. Adv Nutr. 2019 ;10(2):185-95.
6. Willett W, Rockström J, Loken B, et al. Food in the Anthropocene: The EAT–Lancet Commission on healthy diets from sustainable food systems. Lancet. 2019 ;393(10170):447-92.
7. Strath LJ, Sims AM, Overstreet DS et al. Dietary Inflammatory Index (DII) is Associated with Movement-Evoked Pain Severity in Adults with Chronic Low Back Pain: Sociodemographic Differences. J Pain Res. 2022;23(8):1437-47.
8. Nijs J, Elma Ö, Yilmaz ST, et al. Nutritional neurobiology and central nervous system sensitisation: Missing link in a comprehensive treatment for chronic pain? Br J Anaesth. 2019;123(5):539-43.
9. Wirth MD, Hébert JR, Shivappa N, et al. Anti-inflammatory Dietary Inflammatory Index scores are associated with healthier scores on other dietary indices. Nutr Res . 2016 Mar 1;36(3):214-9.
10. Thompson FE, Subar AF. Dietary assessment methodology. Nutri Preven Treat Dis. 2017:5-48.

Citation: *Wu J. Vertebroplasty: An Innovative Solution for Spinal Fractures.J Ortho Sur Reh.2024; 8(3):203*