Vertebro-plasty

Interventional Radiology at Virginia Mason

Working Together for Better Outcomes

About Percutaneous Vertebroplasty

Background information

Osteoporosis affects more than 30 million Americans. Compression fractures occur in more than 500,000 patients per year in the US. They are more frequent than hip fractures, and can result in prolonged disability. Risk factors include advanced age, Caucasian or Asian race, low weight, diseases such as kidney failure, and use of certain medications, such as prednisone (corticosteroids). Current preventative measures include calcium and vitamin D supplementation, exercise, smoking cessation, and bone metabolism medications (biphosphonates). Patients should see seek the advice of their regular doctor regarding the assessment and medical management of osteoporosis.

The management of verterbral compression fractures includes pain control with acetaminophen (Tylenol), non-steroidals (Motrin), narcotics (Percocet), and bracing. Unfortunately, compression fractures often progress and develop at other levels resulting in loss of height, disability, and secondary complications from immobilization including pneumonia and pulmonary embolism.

What is Vertebroplasty?

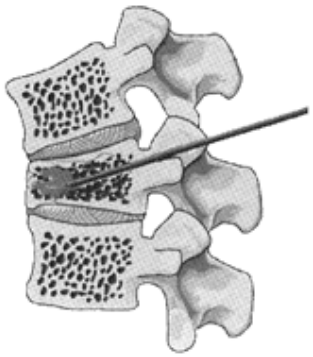
Percutaneous vertebroplasty has recently been introduced into the US as an effective therapeutic and preventative treatment for the pain and progressive loss of height in compression fractures. Vertebroplasty literally means fixing the vertebral body.

A metal needle is passed into the vertebral body and a cement mixture containing polymethylmetha

crylate (PMMA), barium powder, tobramycin (an antibiotic used in some cases), and a solvent are injected into the compressed vertebral body under x-ray guidance by the physician. The cement hardens rapidly and supports the weakened bone. Pain control may also be in part due to deadening of the nerve within the vertebral body, as a result of the cement injection. The barium powder makes the cement visible on x-ray. The tobramycin is an antibiotic used in certain cases. The procedure was originally developed in France in 1984 and has been further refined in the US since 1995. Thousands of cases have been performed in the US.

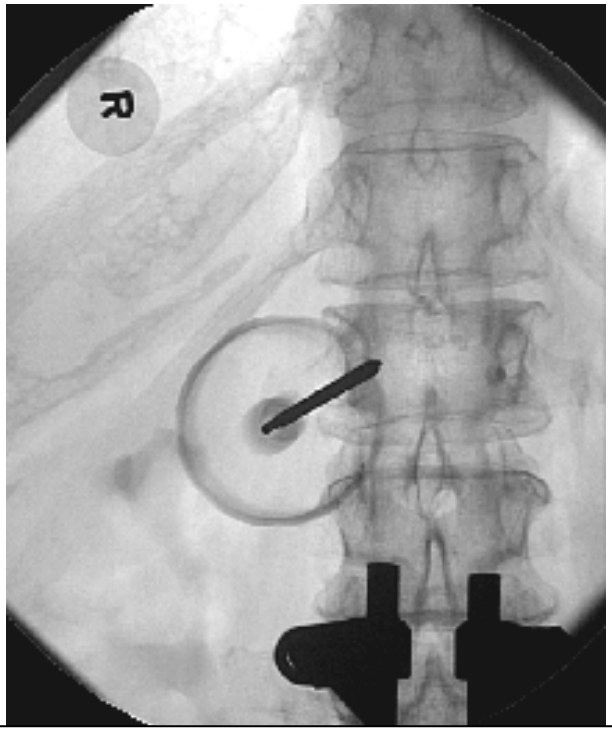
How is vertebroplasty performed?

The procedure is performed under sterile conditions in the interventional radiology suite with special x-ray equipment, and with the assistance of nurses and technologists to help sedate the patient and operate the equipment. The patient is placed prone (face down) on the angiography table, and made as comfortable as possible. Sedation usually includes a narcotic pain medicine (fentanyl) and a relaxing medicine (Versed, a benzodiazepine). These medicines are short acting, and can be reversed if necessary. The skin and underlying tissues are anesthetized with lidocaine, and then a special bone needle is passed slowly through the pedicle into the vertebral body using a slightly angled posterior approach.



Drawing of a vertebral body compression fracture undergoing treatment by percutaneous vertebroplasty (side view).

A needle is placed into the compressed vertebral body from a posterior approach, and methacrylate cement is injected.



Frontal view X-ray taken after placement of the vertebroplasty needle.

CT (CAT scan) image of a vertebral body with methacrylate within the marrow space, following vertebroplasty.

Risks of the Vertebroplasty procedure

(There have been very few reports of serious complications form this procedure in the US.)

1. Leakage of cement into veins and/or lungs
2. Bleeding
3. Pneumothroax (air around a lung)
4. New or worsening pain (compression of a nerve by cement)
5. Infection
6. Fractuire (rib or vertebral pedicle)
7. Paralysis secondary to leakage of cement around the spinal cord

What are indications for (reasons to perform) Vertebroplasty?

1) Painful compression fracture secondary to osteoporosis (most common indication)
2) Painful compression fracture secondary to tumor or spine metastasis
3) Prevent further compression fractures or to buttress weakened bone for spine fusions

Relative Contraindications

1) Young patient - the long-term effects of the cement mixture are unknown
2) Vertebral bodies above the T5 level - the procedure is riskier and more difficult
3) Patients with prior unsuccessful spine surgery
4) Severely flattened vertebral body

Patient Evaluation

1) History and Physical Examination 2) Current x-rays 3) MRI (STIR) +/- bone scan

Follow Up Care

1) Pain medications - usually begin with the same dose and medication the patient has been taking prior to the procedure, which is then tapered over several days following the procedure
2) Muscle relaxants (if needed)
3) Adjust medications to prevent further mineral loss

Vertebroplasty Statistics

1) >80% moderate to marked pain relief 2) <5% induced fractures from procedure

3) <1% symptomatic embolism or infection

Who To Contact with Questions / Problems

Virginia Mason Interventional Radiology Clinic: (206) 341-0495
Voice mail for David H. Robinson, MD: (206) 341-0935
Virginia Mason Department of Radiology: (206) 223-6851
Virginia Mason Emergency Room: (206) 583-6433
Your referring physician's office: Dr._____@_____

Congratulations. You have undergone, or are soon to undergo, a new, "minimally invasive" technique of repairing your compression fracture called Vertebroplasty. Because this technique is much less invasive than other surgical techniques, you will have much less pain than expected from an open surgery, and a shorter hospital stay (most patients go home within 4 - 5 hours of the procedure, or the following morning). You should require much less pain medicine, and should be able to return to your normal activities much faster than you would following an open surgical procedure. Be aware that although this technique has all these benefits, it is still a surgical procedure, and certain precautions should be followed before and after your surgery. The list below is intended to help you understand what you should and should not do before and after surgery.

BEFORE SURGERY

1) Stop taking all aspirin and non-steroidal anti-inflammatory medications (e.g. Plavix, Advil, Naproxsyn, Relafen, etc.) five days before surgery. You may want to consult with the doctor who prescribed these medicines for you, to be sure it is OK that you stop taking theses medicines for a few days, at this point in time.

2) Shower the night before surgery.

3) Do not eat after midnight, the night before surgery.

4) If you are allergic to X-ray contrast, or any medications, tell your doctor, nurse or Technician.

5) If you have any questions about other medications, ask your doctor.

AFTER SURGERY

1) Use your prescribed pain medication, muscle relaxers, and laxatives as directed.
2) If instructed to, wear your brace as directed.
3) There are no stitches to remove. Small bandages are on your incision. These can be removed in 24 hours.
4) Do not soak in a bathtub for 3 days, or shower for 24 hours.
5) Avoid heavy lifting, especially for the first month (i.e. nothing heavier than a carton of milk). After that you can gradually increase your lifting to normal.
6) Remain at bed rest for at least 12 hours after the procedure (overnight), after that time, walking is encouraged, and bending can be done, within the restrictions of any brace you have.
7) You should call your physician in 3-4 days to determine whether or not a specific follow-up visit should be scheduled, but feel free to call sooner, or at any time later, if you have problems, questions or concerns regarding the procedure.
8) Watch for signs of fever, chills, warmth, redness, or drainage from your incision. A slight amount is normal for a day or two following surgery.
9) Report immediately to your doctor if you experience any significant new pain in the hips or legs, new leg weakness or numbness, or new shortness of breath or chest pain occurring within a day or two of the procedure.