Multiple alternate-sided percutaneous verteoplasties

Marc Prod’homme 1, Didier Grasset,1 Marie-Pierre Raemy,2 Duccio Boscherini1

DESCRIPTION

Vertebral compression fractures (VCF) are frequent injuries mostly related to bone fragility1 and are successfully treated by cementoplasty, such as vertebroplasty or kyphoplasty.2–3 Vertebroplasty requires the use of two-dimensional (2D) imaging for intraoperative control of cement filling. Three-dimensional (3D) imaging with computerised navigation offers more accurate procedure.4 Ionising radiation level related to the use of imaging devices may be estimated with the calculation of the effective dose E.5 A 57-year-old female patient, known for a metastatic pancreas cancer since 2018, came to our office because of progressive back pain. The patient clinically presented with a pain on numeric rating scale (NRS) of 6/10 from the mid-thoracic region to the whole lumbar region, increasing with manual percussion on the midline, but she was neurologically intact. Thoracolumbar MRI showed multiple osteoporotic VCF from T9 to L5: three concave and six bow-shaped types according to Sugita et al (figure 1). A percutaneous multilevel vertebroplasty procedure was scheduled with 3D navigation aided by the O-arm (O-arm Surgical Imaging System, Medtronic, Minneapolis, Minnesota, USA), and X’Pede cement (Medtronic, Minneapolis, Minnesota, USA) was used. Two 3D acquisitions were required to cover first the vertebrae L2 to L5, and second the vertebrae T9 to L2. Each vertebra was accessed through an extrapedicular single approach of the Jamshidi-navigated needle (PAK Needle, Medtronic, Minneapolis, MN, USA) introduced in the vertebral body (figure 2) from an alternate side. For thoracic vertebrae, the needle position was at the junction of the transverse process and rib below the superior articular facet joint of the vertebra to be cemented,6 and for lumbar vertebrae, through a far lateral extrapedicular approach according to Ryu et al.7 2D mode of the O-arm was used for cement injection control, 18 cubic centimetres (cc) of viscous cement for the whole procedure (about 2 cc per vertebra). After removing all trocars, staples were used for skin closure. The whole procedure duration from incision to closure was 40 min. Blood loss was 20 cc. Effective dose (E, in mSv) was calculated with the dose length product (DLP in mGy.cm) and the dose area product (DAP, mGy.cm2) according to the recommendations of the International Commission of Radiological Protection8 using conversion factors k = 0.015 mSv/mGy.cm and w = 0.26 mSv/Gy.cm2, such as E = DLP x k and E2D = DAP x w, leading to an overall E of 5.54 mSv. This result was slightly higher than...
annual natural irradiation in Switzerland (4.32 mSv). Postoperative radiographs showed adequate cement filling without any leakage (figure 1). Pain level decreased to 2/10 postoperatively on the NRS.

The most important finding in this case was the short operative time and blood loss, with good clinical and radiological results. 3D navigation was particularly effective to save time with a high accuracy.

Moulin et al reported results of 24 multilevel vertebroplasties through the same procedure on more than 6 levels of VCF in patients with cancer. Operative time was higher, with a mean of 167 min. The authors concluded as a safe and effective technique, similarly to the current case.

Patient's perspective

When I saw the senior surgeon at his office, I almost could not move because of progressive and intense back pain. I agreed for the surgery with the expectation of good pain relief. When I arrived at the clinic, my pain level was a continuous 6/10 and I felt really relieved.

Learning points

► Percutaneous single-approach extrapedicular multilevel vertebroplasty was safe and effective.
► Three-dimensional navigation helped to perform more accurate surgery and to save time.
► Alternate-sided pattern helped performing effective and quick surgery, as no trocar was bothering or cumbersome on the operative field.

Copyright 2021 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit https://www.bmj.com/company/products-services/rights-and-licensing/permissions/

Become a Fellow of BMJ Case Reports today and you can:
► Submit as many cases as you like
► Enjoy fast sympathetic peer review and rapid publication of accepted articles
► Access all the published articles
► Re-use any of the published material for personal use and teaching without further permission

Customer Service

If you have any further queries about your subscription, please contact our customer services team on +44 (0) 207111 1105 or via email at support@bmj.com.

Visit casereports.bmj.com for more articles like this and to become a Fellow.