D3 Pulmonary Cement Embolism After Kyphoplast: A Case Report

Martina Focardi, Largo Brambilla 3, Florence, ITALY; Aurelio Bonelli, Largo Brambilla 3, Florence 50134, ITALY; Federica De Luca, MD, Department of Forensic Medical Sciences, University of Firenze, Largo Brambilla, 3, Firenze 50134, ITALY; Vilma Pinchi, Largo Brambilla, 3, Firenze, ITALY; and Gian A. Norelli, sez.dep.Medicina Legale, Firenze, ITALY*

After attending this presentation, attendees will be able to collect useful data relating to the possibility of polymethylmethacrylate (PMMA) cement embolism following kyphoplasty (KP), often unrecognized and confused with embolism by Central Venous Catheter (CVC). This presentation will enrich the scientific community since there are very few reports about this topic.

This presentation will impact the forensic science community by showing how, as in the case of a claim for damage compensation relating to embolism after KP in a CVC bearer, it is important to carry out all necessary investigations to ascertain and clarify the nature of the embolus.

Background: Kyphoplasty (KP) and vertebroplasty (VP) are very common procedures used to treat vertebral fractures. Pulmonary Embolism (PE) is one of the most feared complications of these procedures, with rates ranging from 3.5% to 23%. Local cement leakage and pulmonary cement embolism are quite rare complications, more frequent after VP than KP. Symptoms related to PE were noted in only 0.4% to 0.9% of cases. In fact, in the vast majority of patients, PE after KP is often discovered incidentally by post-operative chest X-rays or Computed Tomography (CT) carried out for other purposes. The literature instead reports cases of PE by CVC occurring more frequently. A postoperative chest radiograph is routinely obtained to confirm the position of the CVC and to rule out complications due to a fractured CVC with embolism of the distal fragment which may lead to catastrophic complications. The diagnosis of the nature of the embolism, as in the case reported by this study, is important not only for clinical purposes, but also for the related legal issues.

Case Report: A 64-year-old man suffering from a lumbar fracture due to injury underwent neurosurgery (KP) with the use of PMMA osseofix. On the seventh postoperative day, the man showed dyspnea. A CT of the chest was performed and revealed the presence of a pulmonary embolism from a foreign body. This finding led to the belief that it was a fragment of the CVC tip as this is a potential and quite common complication. The foreign body was removed by open thoracic surgery following the failure using the percutaneous approach. During surgery, in the apical medium portion of the right pulmonary, a pluri-fragmented whitish colored element was found. After being discharged from the hospital, the subject made a claim for damages against the hospital. The hospital then ordered an investigation to understand the nature of the surgical specimen. This material was examined by spectrometry to understand the nature of embolism (either CVC fragments or PMMA cement). The examination identified parts of the PMMA used for the KP.

Discussion and Conclusion: The possibility of cement embolism after VP and KP should be considered in all cases of dyspnea following neurosurgery. The presence of PMMA in pulmonary blood vessels is under-reported in literature, but it is quite common in clinical practice and, if not diagnosed early, may lead to serious consequences for the patient. There are reported cases in literature in which the cement was lodged in the pulmonary vases for long periods of time without causing damage. As in this case, when it's necessary to understand the true nature of the embolism, the adoption of a chemical investigation provides useful data for a sure differential diagnosis. The diagnosis is useful not only for clinical but also for medicolegal purposes. In fact, in the case of CVC-fragment PE, the patient could make a claim for damages to the manufacturer for a defective medical device and the manufacturer has to compensate for the damage. In the case of PMMA embolism as in the case reported, once it is demonstrated that it was a complication, the damage does not require compensation.

Kyphoplasty, Pulmonary Embolism, PMMA

 ** Presenting Author*