D87 Contribution of Postmortem Computed Tomography (CT) in Skeletal Trauma: About 28 Forensic Cases

Celine Leconte, MD, Service de médecine légale, CHU Lapeyronie, 371, avenue Doyen Gaston Giraud, Montpellier 34295, FRANCE; Pierre-Antoine Peyron, MD, Département de Médecine Légale, CHU Lapeyronie, 371, Avenue Doyen Gaston Giraud, Montpellier 34295, FRANCE; Philippe Cathala, MD, PharmD, Chu Montpellier, Hôpital Lapeyronie- Departement De Médecine Légale, Av Doyen G Giraud, Montpellier 34295, FRANCE; Arthur Meusy, Service De Médecine Légale, Hopital Lapeyronie 371, Avenue Du Doyen, Gaston Giraud 34295 Montpelli, Montpellier 34295, FRANCE; and Eric Baccino, MD, 371, av du Doyen Gaston GIRAUD, 34295 Montpellier, Hopital Lapeyronie, Cedex 5 34295, FRANCE*

The goal of this presentation is to show the benefits and the limits of postmortem CT in skeletal damages.

This presentation will impact the forensic science community by permitting attendees to discuss the aims and the place of postmortem CT in modern forensic sciences.

Background: In France, postmortem full body CT is increasingly used for forensic purposes before a traditional autopsy is performed. However, the precise indications of CT are disputed in literature, ranging from almost never to the concept of virtopsy (i.e., in every case). Skeletal trauma is a well-known and accepted indication of CT scan. The goal of this preliminary study was to compare CT findings with autopsy results in forensic cases with severe trauma.

Method: In a group of 339 consecutive autopsies, 39 with a history of possible severe trauma had a postmortem CT before autopsy. In each case, lesions were classified according to the topography (skull, larynx, thorax, rachis, pelvis, upper and lower limbs). The radiologist and the forensic pathologist wrote independent reports which were compared by forensic pathologists who were not involved in these cases. Results between the two methods were compared with the McNemar's test.

Results: Twenty-one males and seven females, mean age-at-death was 33 years of age, and time elapsed between death and CT ranged from a few hours to five days.

Deaths resulted from traffic accidents (n=17), falls from height (n=8), assault and battery (n=1), and other causes (fall of a hydraulic hoist and a decomposed body (n=2). CT provided a better description of skull fractures (especially the ones concerning basilar region and the calvarium) and seemed to have a better sensibility in identifying mandibular fractures (14 versus 9).

CT showed more non-comminuted scapular fractures and it allowed a more precise description of sacroiliac fractures. CT interest was even more obvious for detecting fractures of the extremities of long bones and hands. In upper limbs, 55 factures were found using CT versus 29 in autopsy ($p<0.001$) and in lower limbs 84 fractures were found (CT) versus 36 ($p<0.001$) in autopsy.

CT could be more efficient for the diagnosis of fractures of dorsal vertebras (22 vs. 16) whereas autopsy found more fractures of cervical vertebras (21 vs. 15 (CT)). There were many discrepancies between both techniques in the description of fractures of the ribs, although the ones involving the posterior arch were seen better by autopsy.

Autopsy was much more efficient for detecting laryngo tracheal lesions (six on hyoid bone and five on the thyroid cartilage) as CT showed only two laryngeal fractures.

Discussion and Conclusion: More experience and training of the radiologist on postmortem material will probably improve the results of CT as well as the exchange of information with the forensic pathologist before releasing the report. Therefore, even if the small sample size does not allow definite conclusions, it is thought that this study clearly supports the obligation of performing postmortem CT to assess skeletal damages in 2013.

However, CT missed some lesions of paramount forensic value such as laryngeal, hyoid, and posterior rib fractures which were detected by the autopsy.

At its best, skeletal trauma postmortem CT remains a complementary and valuable tool of forensic diagnosis. Getting rid of autopsy in any forensic case in 2013 is scientific nonsense and a judicial liability.

Autopsy, Computed Tomography, Comparison

