CQ03 What is fluid collections observed as postmortem changes on postmortem CT?

Grade of recommendations: C2

A postmortem CT may show nonspecific fluid collections in the cavities at the head-and-neck and trunk. It is necessary to consider whether it was pre-existing, before death or a postmortem change, and we should be able to evaluate it by referring to the antemortem condition and situation at the time of death.

Explanation----------

Paranasal sinus

Postmortem CT may show fluid collections in the sinuses [1-3]. No report has examined increases from those of antemortem CT, but some reports of postmortem CT identified fluid collections in the sinuses in about 30% of cases [1, 2].

Trachea, bronchi

Postmortem CT often shows fluid collected in the trachea and bronchi [4]. With pleural effusion and infiltrative shadows, these are effects which tend to cause extensive collapse of the lung parenchyma, making it easier to see fluid retained in the trachea. Fluid collected in the trachea and bronchi does not reflect the directly pathological condition.

Pleural fluid collection

There is no significant change in pleural fluid pooling early in the postmortem period. There is no apparent increase up to 30 hours after death, but it is reported that pleural fluid collections tend to increase from about 30 hours after death [5]. (See the CQ6 column for the correct use of the terms “pleural effusion” and “pleural fluid collection” in forensic medicine).

Column----------

Similar to the sinuses, postmortem CT often shows fluid collected in the nasal and pharyngeal cavities. This may be due to postmortem changes such as increased membrane permeability, and the fluid contents of the esophagus and stomach may also be regurgitated, resulting in fluid collecting in the head and neck cavity. This makes it necessary to evaluate the CT images considering vomiting before death and also vomiting immediately before death, postural changes during transportation, and the involvement of resuscitation.

Literature search formula and literature selection（2019/6/7）

PubMed

#	Search formula	Number of documents
1	((((((((((postmortem)OR post-mortem)OR "post mortem"))AND imaging))OR(((((postmortem)OR post-mortem)OR "post mortem")) AND CT))OR(((((postmortem)OR post-mortem)OR "post mortem")) AND "computed tomography"))OR(((((postmortem)OR post-mortem) OR "post mortem"))AND MR))OR(((((postmortem)OR post-mortem) OR "post mortem"))AND "magnetic resonance")))OR(((((postmortem) OR post-mortem)OR "post mortem"))AND MDCT))OR((MSCT) AND(((postmortem)OR post-mortem)OR "post mortem")))	23,704
2	((((fl uid OR eff usion OR ascites))))AND #1	1,904

Ichusi（Medical journal）

#	Search formula	Number of documents
1	(死後CT/AL or 死後MRI/AL or（死亡時画像診断/TH or 死亡時画像診断/AL）or（死亡時画像診断/TH or オートプシーイメージング/AL））and（LA=日本語, 英語 and PT= 会議録除く）	529
2	(液体 /AL or 液貯留 /AL or 胸水 /AL or 腹水 /AL)and #1	41

References

[1] Sieswerda-Hoogendoorn T et al: Normal cranial postmortem CT findings in children. Forensic Sci Int 2015; 246: 43-49 (Level 4b)

[2] Wagensveld IM et al: Total-body CT and MR features of postmortem change in in-hospital deaths. PLoS One 2017; 12: e0185115 (Level 4b)

[3] Kawasumi Y et al：Diagnosis of drowning using post-mortem computed tomography based on the volume and density of fluid accumulation in the maxillary and sphenoid sinuses. Eur J Radiol 2013; 82: e562-566 (Level 4b)

[4] Ishida M et al: Fluid in the airway of nontraumatic death on postmortem computed tomography: relationship with pleural effusion and postmortem elapsed time. Am J Forensic Med Pathol 2014; 35: 113-117 (Level 4b)

[5] Hyodoh H et al: Time-related course of pleural space fluid collection and pulmonary aeration on post-mortem computed tomography (PMCT). Leg Med 2015; 17: 221-225 (Level 4b)