



H80 Death Due to External Compression of the Trachea in a Case of Multinodular Hemorrhagic Goiter

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Learning Overview: After attending this presentation, attendees will better understand the main mechanisms responsible for external compression of the trachea in a case of intra-thyroid bleeding.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by presenting an extremely rare case of asphyxia due to a massive intra-thyroid hemorrhage with an acute external compression of the trachea.

An 81-year-old White female (142cm height and 45kg weight) with a history of multinodular goiter for about 40 years, following the onset of a clinical condition characterized by acute respiratory failure, was transported to the emergency room by ambulance, where the death was ascertained within a few hours after admission.

A recent cardiologic examination in the clinical records reported, in the absence of risk factors for cardiovascular diseases, a sinus tachycardia with a heart rate of 131bpm (beats per minute), a negative objectivity for signs of cardio-circulatory failures, a blood pressure of 120/80mmHg, and a modest exertional dyspnea. At laboratory analysis, Thyroid-Stimulating Hormone (TSH) 0.01 microUI/mL, FT3 (free triiodothyronine) 4.76pg/mL, and Free Thyroxine (FT4) 2.33ng/mL were found, pointing out a hyperthyroidism pattern, attributable to a Basedow's goiter.

At the autopsy, the thyroid presented a weight of 1,510g and showed a much-increased consistency with an irregular and frankly hemorrhagic appearance, compatible with the development of an extensive hemorrhage within a massive multinodular goiter. An extensive hemorrhagic infiltration of mediastinal soft tissues and a tracheomalacia due to compression and dislocation determined by the bulky thyroid mass were also detected.

The microscopic examination confirmed the presence of a wide hemorrhagic area extended to the perithyroidal soft tissues and showed the presence, in sub-pleural location, of intra-alveolar accumulation of erythrocytes and of amorphous eosinophilic material in the alveolar spaces. Blood congestion in pulmonary vessels was also evident, with diffused atelectasis and emphysema.

The microscopic and macroscopic findings suggested the cause of death was a mechanical asphyxia, not attributable to external agents. The goiter (overly bulky if related with the weight-height ratio of the patient) was complicated by the development of intra-thyroid and intra-capsular multiple hemorrhages, involving perithyroidal tissues and the upper mediastinum, and causing an acute swelling of the gland and an external compression of the trachea, leading to the subject's death.

Conclusively, the case herein described has been never reported in the international scientific literature and offers meaningful insights on the mechanisms underlying death in the event of sudden massive bleeding within the thyroid, resulting in a significant swelling of the gland, with external compression of the trachea and the development of an acute asphyxia.

Multinodular Goiter, Intra-Thyroid Hemorrhage, Asphyxia