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Death due to traumatic tracheo-brachiocephalic artery fistula: an autopsy case

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SUMMARY
Tracheo-brachiocephalic artery fistulas were rarely reported lesions often described in cases with tracheostomy procedures. Reported case was 26 year-old male drainage worker, trapped under the stony soil while excavating drainage canal. Rescue operation was performed, but he was reached dead. Provincial prosecutor mandated autopsy after crime scene investigation. Autopsy examination revealed traumatically formed tracheo-brachiocephalic fistula. We aimed to report an intersting case of traumatic tracheo-brachiocephalic artery fistula identified in forensic autopsy.

Keywords: trauma – tracheoarterial fistula – autopsy

Smrt způsobená úrazovou píštělí mezi tracheou a truncus brachiocephalicus - popis případu

SOUHRN
Traumatická píštěl mezi tracheou a truncus brachiocephalicus je vzácná léze, častěji popisovaná spíše po tracheostomiích. Je uváděn případ muže starého 26 let, který byl při práci zavalen kamenitou půdou při hloubení odvodňovacího kanálu. Když dorazila záchranná služba, byl již mrtvý. Po ohledání místa činu byla nařízena soudní pitva, která odhalila tracheo-brachiocephalickou píštěl traumatického původu.

Klíčová slova: trauma – trechoarteriální píštěl – pitva.

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Tracheo-brachiocephalic artery fistulas were extremely rare diagnosed (1,2). As unusual lesion tracheo-arterial fistula often described in cases with tracheostomy procedures and post-intubation period, was not included among the differential diagnosis of massive hemoptysis (3,6). Reported is the traumatic tracheo-brachiocephalic fistula case identified in forensic autopsy.

CASE REPORT

Presented case was 26 year-old male drainage worker. According police investigation document co-workers claimed that while victim was working in 4.5 m deep drainage canal with co-worker a small landslide of soil underwent and two workers were trapped under the stony soil while excavating drainage canal. Rescue operation was performed, first worker was rescued alive in few minutes but the second was reached dead after 8 minutes. Provincial prosecutor mandated autopsy after crime scene investigation. Deceased was, 180 cm in height and 85 kg in weight men. On gross external examination dust and soil covering face, bleeding from the mouth and nose were detected. Cyanosis of the nail beds, wide bruises on chest and left lumbar region were observed. Autopsy macroscopic investigation revealed blood aspiration areas on lung surfaces, left lung weighed 750 gr, right lung weighed 610 gr, intraparenchymal blood aspiration areas on lung dissection were also examined. Tracheal examination showed intensive massive bleeding, 1.5 cm ecchymotic laceration area in trachea situated 5.8 cm below the rima glottidis was inspected (Figure 1), in correspondence with these lesion on aortic dissection, 2.3 cm laceration area in the lumen just above on divison of truncus brachiocephalicus, traumatically formed tracheo-brachiocephalic fistula was determined (Figure 2). The direct cause of bleeding was detected tracheal and brachiocephalic arterial injury with coexistence of fistula. Microscopic examination of the internal organs was unremarkable, only lungs revealed blood in the lumina of peripheral bronchi and pulmonary alveoli. Investigation of the blood, urine, and organ specimens revealed none of the substances screened in systematic toxicological analysis. After autopsy the death was reported as massive bleeding caused by traumatic tracheo-brachiocephalic artery fistula.

DISCUSSION

Tracheo-brachiocephalic artery fistulas were diagnosed between 0.6% to 0.7% in post tracheostomy patients within one month

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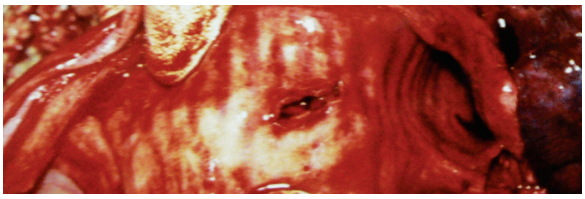


Figure 1. Ecchymotic laceration area detected in trachea.

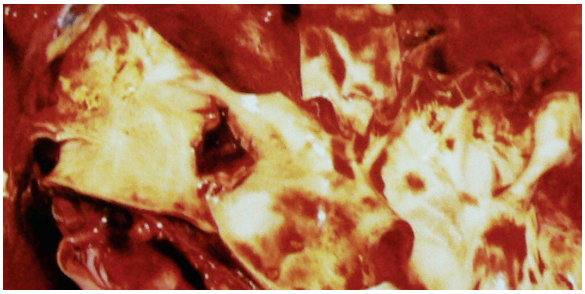


Figure 2. Traumatically formed laceration area in the lumen of truncus brachiocephalicus with correspondence of the laceration in trachea.

after application of the endotracheal tube (1,2). In the differential diagnosis of massive hemoptysis pulmonary contusion, bronchiectasis, bronchitis and malignancies were often reported (3), whereas the tracheoarterial fistula which presented with bleeding prior to onset in 30% to 50% of cases, were not traditionally included among differential diagnosis (1). Post-traumatic carotid artery injuries were rarely defined important lesions with high mortality and morbidity risks (4), especially tracheo-brachiocephalic artery fistula were described as pathologies with poor prognosis with survival rates of 10 % to 30 % (1). In the medical literature tracheoarterial fistula was determined as an unusual lesion developed during tracheostomy procedures and post-intubation period, furthermore also related with tumor invasion, radiotherapy and various surgical interventions (5,6). Tracheo-brachiocephalic artery fistulae were divided in two subgrups, classified as extra-tracheal and endo-tracheal in the study of Ogawa et al according to the bleeding mechanism after application of tracheal tube (1). The vast majority of carotid artery injury cases were reported as carotid artery dissections determined after road traffic accidents (1,2,7). As it was examined in the deceased, sudden massive bleeding was reported as the first sign of the pathology, also poor prognosis with survival rate of 10 % to 30 % were described in tracheo-brachiocephalic artery fistula cases (1). It was exposed that early diagnosis and intervention after blunt traumatic carotid artery injury was extremely important in association with involvement of adjacent chest organs or structures (4,7). Under emergency conditions immediate operative approaches were mandated, but proper localization of tracheobronchaial system bleeding was stressed significant for decision of medical procedure (1.7). For identification of anatomical relationship between the trachea and brachiocephalic artery, contrast-enhanced computed tomography study was reported as useful (1), besides Dellinger et al. (3) stated that endotracheal tube application was a significant maneuver for initial bleeding control. Emergency tracheobronchoscopy for diagnosis and early surgical repair which requires the resection of the vascular segment involved were described as mandatory (1,2,7). Among trauma cases with massive hemoptysis, tracheo-brachiocephalic artery fistula development should be noted as differential diagnosis. From medico legal aspect, autopsy identification and scientific description of these entiry will also contribute for proper clinical intervention of the pathology.

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