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ORIGINAL ARTICLE

Importance of tissue biopsy in suicidal hanging deaths

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KEYWORDS

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Thyroid gland

Abstract: This is a 5-year retrospective study including all autopsy reports of suicidal hanging deaths in Dammam city, Eastern province in Saudi Arabia.
Hematoxyline and eosin stain has been used for the microscopic description of the three tissue biopsies that have been selected in this study. Other confirmatory tests have been performed for certain cases, when needed.
The total number of cases was 62; 85.5% of the deceased were males, while 15% were females. The majority of cases (53%) were among the age group of 20–30 years. Hemorrhage of the sternocleidomastoid muscle and carotid intimal tear were both found in 90% of cases. Thyroid congestion was detected in 91%, and Hashimoto's thyroiditis was diagnosed in 2% of studied cases. The study discusses the importance of biopsy examination in hanging deaths and compares its results with other similar previous studies.

1. Introduction

Over one million people die by suicide every year.[1] Latest WHO mortality database (2012) found that suicide death among 15–28 years old globally was the second leading cause of death.[2]

In 2008, WHO made a review of 56 countries, which found that hanging was the commonest method of suicide in most countries, followed by poisoning.[1] In some countries, such as Germany and Japan, hanging has been ranked as a leading method of suicide, while in India and US, it is the second leading cause of suicide after intoxication and firearms injuries, respectively.[3]

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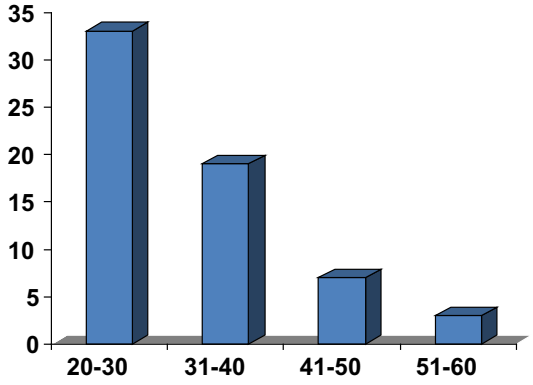

Figure 1 Age distribution of cases.

Forensic report should carefully consider the manner of death in hanging cases. Despite the fact that the great majority of hangings are suicides, such an opinion should only be given after careful autopsy findings with careful consideration of the crime scene. The homicidal manner of hanging death is very rare, as the victim would usually need to be unconscious, overpowered or intoxicated before the assailant could perform the act.[4] Although certain pathological findings are usually considered as a classical sign in hanging deaths, such as Simon's bleeding still there are many other signs that are controversial like: bowel wall hemorrhage, sternocleidomastoid muscle hemorrhage, thyroid tissue findings, and many other signs.[5–7]

The purpose of this study was to analyze and document the histopathological features of neck structures in relevant deaths to attain a better understanding in cases of suicide hanging deaths.

2. Material and methods

This study is retrospective in nature (2009–2005) over a period of five years based on the autopsy records of Dammam Forensic Medicine Center, which is responsible for the post-mortem examination of all forensic deaths in the Eastern Province of Saudi Arabia. Only suicidal hanging deaths were selected in this study upon analysis of the death scene investigation, such as presence of a suicide note in some cases, with information gathered from the police. A protocol of Prinsloo and Gordon (a careful neck dissection, layer by layer) was undertaken in the morgue. Neck organs were removed en-block (pharynx, larynx, trachea and esophagus) in order to avoid the creation of artifacts, and gross examination of the cartilaginous compartments of the neck was performed by a full time forensic specialist and a consultant working at the Dammam Forensic Medicine Centre. From each deceased, 3 main blocks of 5 mm thickness were collected from the following structures: sternocleidomastoid muscle straps "under the rope mark", thyroid gland and carotid arteries. They were stained with hematoxylin and eosin for microscopic examination. Expert pathologists who work at the Dammam Regional Laboratory conducted the examination and used the suitable stains whenever indicated.

3. Results

A total of 62 corpses were examined during the period under study, five times as many of which were males (85%) than females (15%). The greatest number of cases (56%) was found in the age group of 20–30 years (Fig. 1). Most of the deceased were non-Saudi (85%), especially Far Eastern laborers, while the rest (15%) were Saudi victims.

There was no fracture of the hyoid bone, thyroid cartilage or cricoid cartilage or any combination of them among the studied cases. The strap muscle examination corresponding to the underlying ligature showed muscle hemorrhage (90%) (Fig. 2).

The histopathological sections of carotid arteries showed features of disruption of the tunica intimal layer in 90%, mild infiltrations showed neutrophils and RBCs (Fig. 3).

97% of the total cases showed manifestations of thyroid tissue. Different pathological findings of the thyroid gland were found; the majority of sections showed general congestion (91%), while 3% showed autoimmune Hashimoto's thyroidi-

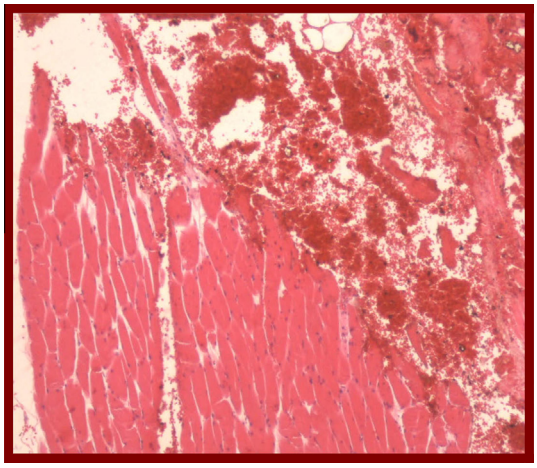

Figure 2 Muscle hemorrhage (RBCs extravasations) seen on the left side.

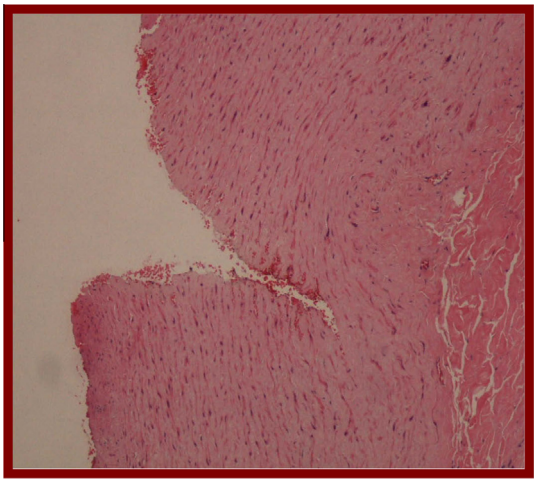

Figure 3 Partial intimal tear of affected carotid artery with few red blood cells extravasations.