



## Pathology Biology Section – 2011

### G64 Pattern of Limb Lesions in Suicidal Hanging: A Criteria Tool in the Distinction of Suspicious Cases

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After attending this presentation, attendees will have a better understanding of the usual pattern of lesions in suicidal hangings and will be aware of the pattern of lesions to be considered suspicious.

This presentation will impact the forensic science community by providing tools to improve the screening of suicidal hangings for possible suspicious cases.

**Introduction:** In this era of limited resources, hanging cases are investigated in several jurisdictions by a limited scene analysis and a rapid external examination of the body. Full body autopsies are becoming less and less frequent in these cases, based on the assumption that hangings are virtually always suicide. Homicidal hangings are therefore at serious risk to be missed, particularly since they are difficult to detect. However, to recommend a full body autopsy on all hanging victims is not realistic considering the limited human and financial resources.

In a recent six-year retrospective study on the pattern of limb bruises in hanging conducted in the Province of Quebec, Canada, it was suggested that the presence of bruises on the anterior upper limb and the presence of bruises on both the upper and lower limbs were two criteria that should alert the pathologist to be more cautious. The presence of bruises on the posterior lower limb was initially proposed as an additional criterion of suspicion, but failed to reach statistical

significance. The present study aims at evaluating the validity of these criteria on a different population and to further investigate the usual pattern of limb lesions in suicidal hangings.

**Material and Methods:** A total of 214 suicidal hangings, investigated at the Office of the Chief Medical Examiner in Alberta, were reviewed for the presence and localization of bruises, abrasions and lacerations. An age- and gender-matched control group of non-hanging homicidal strangulations, composed of 51 cases, was similarly studied.

**Results:** *Incidence of limb lesions:* Bruises were found in 6% of suicidal hanging victims, abrasions in 5% and lacerations in 1%. Compared to homicidal strangulation victims, suicidal hanging victims are less likely to present bruises ( $\chi^2=84.301$ ;  $p=.000$ ;  $\Phi=.564$ ), abrasions ( $\chi^2=75.231$ ;  $p=.000$ ;  $\Phi=.533$ ) and lacerations ( $\chi^2=8.123$ ;  $p=.023$ ;  $\Phi=.175$ ).

*Usual pattern of limb bruises in suicidal hanging:* The usual pattern of limb lesions in suicidal hanging victims was confirmed to be the following: bruises and abrasions are mostly found on the posterior part of upper limbs, on the anterior aspect of lower limbs, and on either the upper or lower limb but not to both in a single case. It was also found that bruises are commonly found on the anterior part of upper arms, but not on the anterior part of forearms. The comparative pattern in homicidal non-hanging strangulation does not display this preferential concentration.

*Suspicion criteria for limb bruises:* Three criteria were statistically confirmed to be in favor of an homicidal strangulation: the presence of bruises and/or abrasions (i) on the anterior forearms (bruises:  $\chi^2=16.500$ ;  $p=.001$ ;  $\Phi=.250$ ; abrasions:  $\chi^2=16.224$ ;  $p=.001$ ;  $\Phi=.247$ ), (ii) on the posterior aspect of lower limbs (bruises:  $\chi^2=39.092$ ;  $p=.000$ ;  $\Phi=.384$ ; abrasions:  $\chi^2=25.642$ ;  $p=.000$ ;  $\Phi=.312$ ), and (iii) on both upper and lower limbs in a single case (bruises:  $\chi^2=51.043$ ;  $p=.000$ ;  $\Phi=.439$ ; abrasions:  $\chi^2=24.682$ ;  $p=.000$ ;  $\Phi=.305$ ).

**Conclusion:** In the evaluation of a given case, the presence of the following distribution of bruises or abrasions should alert the pathologist to be more cautious and to further investigate the case: the presence of bruises or abrasions on the anterior forearms, on the posterior legs, or on both upper and lower limbs in a single case. Of course, the localization of bruises and abrasions is not to be interpreted without all other scene elements and autopsy findings.

**Hanging, Bruise, Abrasion**