



G75 Petechiae in Hanging: A Retrospective Study of Contributing Variables

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After attending this presentation, attendees will better understand the variables contributing to the development of petechiae in hanging.

This presentation will impact the forensic science community by providing evidence-based data on the contributing variables to the development of petechiae in hanging.

Introduction: It is often stated in the literature that petechiae are more frequently observed in cases of hanging where part of the body is supporting the victim's weight, i.e., cases of incomplete hanging, because it is believed that the jugular veins become occluded while the deeper and less compressible carotid and vertebral arteries remain patent. The present study is intended to evaluate the relationship between petechiae and the type of hanging (complete vs. incomplete) as well as several other variables: victim's age, height, weight, the body mass index (BMI), type of ligature and cardiopulmonary resuscitation.

Material and Methods: A total of 309 suicidal hanging deaths were autopsied in the province of Quebec (Canada) over an 8.5-year period. Of these, one case was excluded since it was not a typical hanging but a hanging from height, with dislocation of neck vertebrae (hanging after jumping from a bridge). Additionally, fifty cases were excluded from the analysis because postmortem changes interfered with the evaluation of petechiae (significant decomposition, skeletal and charred bodies). Finally, fifty two cases were also excluded because the type of hanging was not specified in the autopsy files, thus making their analysis not applicable to the present study. Overall, a total of 206 cases were analyzed for the presence of conjunctival, palpebral, gingival and facial petechiae. For each case, the following information was also compiled: gender and age, height and weight, the type of hanging (complete or incomplete), the type of ligature used (rope, wire, clothes, sheet or lace) and the presence of alcohol or drugs. A note was also added about whether or not the victim had received cardiopulmonary resuscitative maneuvers.

Results: *Incidence of petechiae in relation to cardiopulmonary resuscitation maneuvers:* Of the 206 hanging victims, thirty-six underwent attempts at cardiopulmonary resuscitation (CPR). No significant difference existed between the two groups ($\chi^2 = .34$, $df = 1$, $N=206$, $p=.56$).

Incidence of petechiae in relation to the type of hanging: Of the 170 victims without reanimation manoeuvres, 128 died of an incomplete hanging and 42 of complete suspension. The incidence of petechiae in incomplete hanging (50%) was significantly higher than in complete hanging (29%) ($\chi^2 = 5.87$, $df = 1$, $N=170$, $p=.02$). The age and sex distribution was similar between both groups.

Incidence of petechiae in relation to the type of ligature: The type of ligature was known in all 170 cases of hanging victims without reanimation manoeuvres: 72 ropes, 28 electrical cords, 27 pieces of clothing, 30 bed sheets, and 13 shoe strings. These types of ligatures were regrouped into two broad categories: narrow and wide. The incidence of petechiae was similar ($\chi^2 = .66$, $df = 1$, $N=170$, $p=.42$) for wide and narrow ligatures (47% and 40% respectively).

Incidence of petechiae in relation to age: The incidence of petechiae decreased slightly with age, from 61% in teens to 40% in adults over forty years of age. However, the differences between the three age groups was not statistically significant ($\chi^2 = 2.41$, $df = 2$, $N=170$, $p=.30$), and neither was the statistical comparison of victims older to younger than 40-years-old ($\chi^2 = .66$, $df = 1$, $N=170$, $p=.42$).

Incidence of petechiae in relation to the BMI: In the studied population, only two hangings occurred in underweight individuals. For the remaining 204 there was no statistically significant difference between the incidence of petechiae in normal weight individuals and overweight individuals ($\chi^2 = .13$, $df = 1$, $N=204$, $p=.71$). The comparison between the three groups (normal weight, overweight and obese) was not statistically significant either ($\chi^2 = .82$, $df = 2$, $N=204$, $p=.67$).

Incidence of petechiae in relation to height: The incidence of petechiae varied inversely with the height of the victims: 77% in victims of less than 1.60 m, 44% in victims between 1.60 and 1.79 m and 35% in victims of 1.80 m or more ($\chi^2 = 5.36$, $df = 2$, $N=204$, $p=.07$). This is not merely attributable to a difference in the proportion of complete vs. incomplete hangings in the different height groups. Among incomplete hanging victims, a similar inverse relationship with height was noted ($\chi^2 = 4.64$, $df = 2$, $N=155$, $p=.10$).

Asphyxia, Hanging, Petechiae