



### **G19 Dispersion of Hesitation Marks and Defense Wounds: A New Criterion of Differentiation of Sharp Force Suicide and Homicide**

*Stéphanie Racette, BSc\*, Célia Kremer, MSc, Anne Desjarlais, and Anny Sauvageau, MD, Laboratoire de Sciences Judiciaires et de Médecine Légale, 1701, Parthenais Street, 12th floor, Montreal, Quebec H2K 3S7, Canada*

After attending this presentation, attendees will be introduced to a new criterion of differentiation of hesitation marks and defense wounds in sharp force injuries.

This presentation will impact the forensic community and/or humanity by providing new insight in the evaluation of hesitation marks and defense wounds.

In evaluating manner of death, forensic pathologists often rely on widely accepted criteria of differentiation at autopsy. For example, the presence of hesitation marks or defense wounds in sharp force injury cases has been accepted as a criterion of differentiation between sharp force suicide and homicide.

With this study, the authors wanted to enrich the description of hesitation marks and defense wounds. The authors hypothesize that (1) hesitation marks would predominantly be present on inner surface of upper limbs while such predominance would not be found for defense wounds, (2) a possible left predominance in hesitation marks could be found, considering the higher proportion in the general population of right-handed person and finally that (3) hesitation marks and defense wounds would show a different pattern of dispersion on upper limbs.

Over a 5-year period, in the Quebec province (Canada), all cases of suicidal and homicidal sharp force injury presenting hesitation marks (n=43) and defense wounds (n=91) were retrospectively reviewed. For each case, hesitation marks or defense wounds were drawn on an upper limb chart divided into 12 sections covering the upper arm to the hands. The total amount of lesions for each section was compiled as well as the total amount of wounded sections. For all suicidal victims, a general chart of upper limbs was done by superimposing every chart with hesitation marks. The same was achieved with homicidal victims for defense wounds.

- (1) Sharp force victims of suicide presented a significant higher average amount of hesitation marks on inner aspect of upper limbs than on exterior surface ( $p < 0.05$ ). In victims of homicide, no difference was revealed between inner and exterior average amounts of defense wounds.
- (2) In terms of left and right comparison, a left predominance was not found for hesitation marks cases or for defense wounds cases. In fact, in suicide cases, the average amount of hesitation marks was the same on each inner side of upper limbs.
- (3) Graphical superimposition of hesitation marks/defense wounds for all victims visually revealed low dispersion of hesitation marks and high dispersion of defense wounds. This was statistically confirmed by comparing the average amount of hesitation marks/defense wounds and the average total number of wounded sections. For both inner and exterior aspects of upper limbs, the average total number of wounded sections was significantly higher for defense wounds compared to hesitation marks ( $p < 0.05$ ), while no significant difference was revealed for the comparison of average amount of wounds. In other words, for a similar average amount of hesitation marks and defense wounds, the average number of wounded sections on upper limbs revealed to be higher for defense wounds than for hesitation marks. Thus, defense wounds show higher dispersion on upper limbs compared to hesitation marks.

This retrospective study of hesitation marks and defense wounds first confirmed the initial hypothesis of predominance of hesitation marks on inner surface of upper limbs. However, while it is often said that sharp force victims, considering the proportion of right-handed person in the general population, are more likely to present hesitation marks on their left upper limb, this five year study failed to confirm such predominance. Consequently, the authors discourage the use of a left-right characteristic in the evaluation of hesitation marks and defense wounds. The pattern of dispersion of hesitation marks and defense wounds suggests a difference in the pattern of dispersion as a new criterion for hesitation marks and defense wounds.

**Hesitation Marks, Defense Wounds, Sharp Force Injury**