

Commentary on: Kremer C, Racette S, Dionne CA, Sauvageau A. Discrimination of falls and blows in blunt head trauma: systematic study of the hat brim rule in relation to skull fractures. *J Forensic Sci* 2008;53(3):716–9.

Commentary on: Kremer C, Sauvageau A. Discrimination of falls and blows in blunt head trauma: assessment of predictability through combined criteria. *J Forensic Sci* 2009;54(4):923–6.

Commentary on: Guyomarc'h P, Campagna-Vaillancourt M, Kremer C, Sauvageau A. Discrimination of falls and blows in blunt head trauma: a multi-criteria approach. *J Forensic Sci* 2010;55(2):423–7.

Sir,

We have read with much interest three recent articles published in this Journal, dealing with the discrimination of falls and blows in blunt head traumas (1–3). In their results, the authors describe significant criteria suggesting blows to the head: presence of more than three lacerations, laceration length of 7 cm or more, comminuted or depressed calvarial fractures, lacerations, or fractures located above the hat brim line, left side lateralization of lacerations or fractures, more than four facial contusions or lacerations, presence of ear lacerations, presence of facial fractures, and presence of postcranial osseous and/or visceral trauma.

At the origin of these studies, there was the observation that the hat brim rule has a limited validity and its application cannot be recommended. However, the rule as it has been cited by the authors is incomplete as important limitations have not been mentioned.

Because the topic of the differential diagnosis between falls and blows in head trauma is a classic in the German medico-legal literature, for a better understanding of the hat brim rule we would like hereafter to briefly present its origin, definition, applications, and limits.

The first author who faced the question of the localization of a scalp lesion as a discriminating criterion for its origin was Richter in his textbook (4). In the chapter on the battered child, he wrote “skin bruises are mostly reported by the parents as a consequence of repeated falls. Also this explication will not be accepted just like that, especially if the bruises are numerous, if they are localized at regions that cannot be involved in cases of fall, i.e., the cranial vertex, ... if there are no special reasons for repeated falls, ... if the visit to the scene does not show any special condition that can explain repeated falling” (p. 189, translation by the authors). Sixteen years later Kratter (5) tried to better identify diagnostic criteria for distinguishing falls from blows in cases of blunt head trauma: “concerning the value of the scalp injury, it is important to consider whether its localization is a possible site of impact after fall or blow. Blows are possible at every region of the head with the exception of the base of the skull. The region of vertex is an impossible site of impact after fall and similarly impossible is the cranial vault above the line that binds the frontal eminence, the parietal eminence and the external occipital protuberance. ... If such a (lesion) is localized in this area, fall is excluded, except

where from the height or unless an impact against an edge or a corner took place” (p. 226, translation by the authors). Finally, 10 years later, Walcher (6) remembered of Kratter’s reflection and concluded that “by typical fall from one’s height the soft tissues or the centres of force of the skull fractures seldom lie above the line designed by the internal rim of a (man’s) hat” (p. 24, translation by the authors). This rim separates the crown of a hat from its brim: the hat brim line rule was born.

Since its description by Richter (4), Kratter (5) and Walcher (6), other limitations to the applicability of this rule were added (7).

To avoid further misunderstanding and erroneous or vague citations or applications, we consider it important to report a clear definition and to fix some conditions for the validity of this rule.

Injuries from blunt head traumas from falls do not lie above the hat brim line, if all the following conditions are fulfilled:

- Standing position of the body before the fall.
- Fall from one’s height.
- Flat floor.
- Absence of intermediate obstacles.

At the light of these definition criteria, it is evident that this rule cannot be applied in various circumstances, such as cases of kneeling or sitting position before fall, fall from height or downstairs falls, falls with irregular floor, or falls with intermediate obstacles as furniture or walls. Finally, the hat brim line rule does not make any reference to the localization of blow injuries. They can be localized both above and below the hat brim line.

References

1. Kremer C, Racette S, Dionne CA, Sauvageau A. Discrimination of falls and blows in blunt head trauma: systematic study of the hat brim rule in relation to skull fractures. *J Forensic Sci* 2008;53(3):716–9.
2. Kremer C, Sauvageau A. Discrimination of falls and blows in blunt head trauma: assessment of predictability through combined criteria. *J Forensic Sci* 2009;54(4):923–6.
3. Guyomarc'h P, Campagna-Vaillancourt M, Kremer C, Sauvageau A. Discrimination of falls and blows in blunt head trauma: a multi-criteria approach. *J Forensic Sci* 2010;55(2):423–7.
4. Richter M. *Gerichtsärztliche diagnostik und technik*. Leipzig, Germany: Hirzel, 1905.
5. Kratter J. *Lehrbuch der Gerichtlichen Medizin mit Zugrundelegung der deutschen und österreichischen Gesetzgebung und ihrer Neuordnung. Band 2*, 2nd edn. Stuttgart, Germany: Enke, 1921.
6. Walcher K. Über “stumpfe” Kopfverletzungen. *Dtsch Z Gesamte Gerichtl Med* 1931;17:22–9.
7. Schmidt S, Schröder G, Schmeling A. Betrachtungen zur hutkrempe-nregel auf der grundlage einer literaturlauswertung. In: Bockholdt B, Ehrlich E, editors. *Der Sturz. Morphologie, forensische begutachtung, fallbeispiele. Festschrift für Volkmar Schneider*. Berlin, Germany: Berliner Wissenschafts-Verlag, 2005;65–84.

Tony Fracasso,¹ M.D.; Sven Schmidt,² M.D.; and Andreas Schmeling,² Ph.D.

¹University Center of Legal Medicine, University Hospital of Geneva, Rue Michel-Servet 1, 1211 Geneva, Switzerland.

²Institute of Legal Medicine, University Hospital of Münster, Röntgenstr. 23, 48149 Münster, Germany.