Reviewer's comment concerning “An uncommon C1 fracture with longitudinal split of the transverse ligament” (doi:10.1007/00586-011-2102-1 by D. R. Kaiser, R. Ciarpaglini, G. Maestretti)

Helton L. A. Defino

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Traumatic injuries of the cervical spine depend on several variables such as impact magnitude, impact direction, bone quality, position of the head, neck and thorax, morphology of the vertebrae, final vector and rate of application. Isolated force vectors can produce specific injuries in controlled laboratory experiments. However, in clinical situation the final predominant vector force is the result of multiple simultaneous forces rather than a single isolated force. Atlas fractures, not considering the avulsion fractures, are produced by the force application on the head and the force transmitted to atlas that is compressed between the occiput and C2. According to the final force resultant,

different types of atlas fractures can result: hyperextension results in fractures of the posterior arch of C1; lateral bending and axial rotation results in asymmetrical injuries of the atlas and vertical compression produces a burst fracture.

The atlas fracture described by the authors is the result of indirect force application on the atlas, which resulted in an atypical fracture that cannot be classified according to the current system, because it is a lengthwise transverse ligament split. However, the fracture mechanism can be understood and explained by the current biomechanical principle of cervical spine injuries.

H. L. A. Defino (✉)
Spine Surgery Service, Department of Orthopaedics
and Trauma Surgery, Faculty of Medicine of Ribeirão Preto,
University of São Paulo, Ribeirão Preto 14049-900, Brazil
e-mail: hldefin@fmrp.usp.br