Mandibular condylar fractures and acute atlanto-axial subluxation. Part 1 - A new clinical and nosographic evidence. (note: nosography = the systematic description of diseases)

Cutilli T, Corbacelli A.

Department of Maxillofacial Surgery, University of L'Aquila School of Medicine, Italy.

tommasocutilli@tele2.it

AIM: The aim of this study was to analyze the acute repercussions of condylar mandibular fractures on occipital-atlanto-axial joint. METHODS: Twenty-five non-consecutive cases (16 males and 9 females, mean age: 22.96/range 14-36 years), observed and treated in the Maxillofacial Surgery Department of the University of L'Aquila have been considered. Types of fractures examined included: unilateral: 19 cases (solitary: 12; associated with other mandibular fractures: 7; homolateral: 2); bilateral: 6 cases (equivalent: 2; not equivalent: 4). A control group was constituted of 10 patients, 5 males and 5 females, aged from 19 to 24 years (mean-range: 21.6) suffering from acute isolated cervical distortion (whiplash). The study has been performed by means of the analysis of X-ray and computed tomography (CT)-CT/3D of the mandibular condylar regions, the occipital-atlanto-axial structures and the cervical region. RESULTS: In all the cases of fractures of the mandibular condyle an acute alteration of the junctional atlanto-axial structures was present. In case of unilateral solitary condylar fractures the authors have observed an atlas rotation, homolateral to the side of the condylar fracture, independent from the level of the fracture (intra- or extra-capsular). The rotation seems to be proportional to the entity of the condylar fragments dislocation on the horizontal plane and it causes a modification of the articular relations between atlas and axis (atlanto-axial subluxation) and between the atlas and the occipital bone. The authors have observed a constant derangement of the cranio-axial joint on the three planes of the space. In particular, on the vertical plane the CT reconstructions show on the right and left side a different height between the atlanto-axial articular spaces. The largest one is homolateral to the side of the condylar fracture. In case of unilateral condylar fractures associated with other mandibular fracture (homolateral or not) the authors have observed the same alterations of the occipital-atlanto-epistropheal joint, but while on the horizontal plane the rotation of the atlas is always homolateral to the condylar fracture, on the vertical plane the largest atlanto-axial articular space is homolateral to the mandibular fracture with more dislocation of the fragments of fracture (usually the associated not homolateral mandibular fracture). In case of bilateral condylar fractures the authors have observed no alteration of the cranio-cervical joint. In the non-equivalent fractures, they have observed the atlas rotation on the horizontal plane and the junctional derangement on the vertical plane, homolateral to the condylar fracture with greatest dislocation. In the control group the loss of the physiological cervical lordosis has been observed.
Alterations on the horizontal and vertical planes, as the rotation of the atlas, atlanto-axial subluxation or the joint derangement, instead, has never revealed. CONCLUSIONS: The authors state that these results represent a new nosographic entity associated with the condylar mandibular fractures with important clinical, insurance and legal repercussions.


Mandibular condylar fractures and acute atlanto-axial subluxation Part 2 A physiopathological factor for the cervical spine sprain.

Cutilli T, Corbacelli A.

Department of Maxillofacial Surgery, University of L'Aquila School of Medicine, Italy.
tommasocutilli@tele2.it

AIM: The aim of this study was to analyze the physiopathology of the acute cervical injury in the event of mandibular condylar fractures. METHODS: As in the Part 1, 25 non-consecutive cases of condylar mandibular fractures (16 males and 9 females, mean age: 22.96/range 14-36 years) observed and treated in the Maxillofacial Surgery Department of the University of L'Aquila, have been studied. Types of fractures examined included: unilateral: 19 cases (solitary: 12; associated with other mandibular fractures: 7, homolateral: 2); bilateral: 6 cases (equivalent: 2, not equivalent: 4). A control group was constituted of 10 patients, 5 males and 5 females, aged from 19 to 24 years (mean range: 21.6) suffering from acute isolated cervical distortion (whiplash). The study has been performed by means of the analysis of X-ray and computed tomography (CT)-CT/3D of the mandibular condylar regions, the occipital-atlanto-axial structures and the cervical region. RESULTS: In all the patients the following constant alterations that link up with these fractures have been observed: the rotation of atlas, the atlanto-axial subluxation and the derangement of the occipital-atlanto-epistropheal joint, homolateral to the side of the mandibular condylar fracture. The cervical spine shows the constant loss of physiological lordosis with hinge between C3 and C4. In the whiplash, as the authors have been able to assess in the control group, there are no alterations of occipital-atlanto-axial joint and the kinetic vector is placed on the longitudinal plane. In the mandibular condylar fractures the kinetic mechanism is completely different regarding the whiplash. The point of entry is the chin and the kinetic vector is oriented down-up, sometimes oblique in the opposite side. Subsequently the kinetic force is transmitted throughout the mandibular structure and causes the condylar or bicondylar fracture. The kinetic vector is placed before on the vertical plane, then on the horizontal plane and later on the vertical plane. Therefore the dynamics of the crash cannot cause the swaying of the head as in the whiplash. Indeed in the mandibular condylar fractures the authors have observed the cervical distortion with the loss of lordosis on the sagittal plane without whiplash and also a constant derangement of the cranio-cervical joint and the atlanto-axial subluxation. CONCLUSIONS: These results allow to delineate a different physiopathological mechanism: in the event of mandibular condylar fractures, the sprain of the cervical spine seems to be caused by the acute atlanto-axial subluxation.