Cervical Spine X-Rays Of Non-Polytrauma Patients In The Emergency Unit

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Introduction:

The incidence of trauma-related cervical-spine fractures is 19-88 / 100.000 [1,2]. In contrast, the incidence of cervical spine injuries is as high as 19% - 51% of all spinal trauma [1,3]. Cervical spine injuries in non-polytrauma patients are rare. However, due to the potential damage to the spinal cord these traumata are feared and mustn´t be missed. Cervical spine injuries represent the highest reported early mortality rate of all spinal trauma [4]. The rate of functional impairment afterwards is high and the rate of reintegration into work is low compared to other organ systems.

In the past, trauma surgeons often did x-rays of the cervical spine with low inhibition threshold and often without strong clinical suggestion for vertebral or discoligamental injuries. This practice was queried by the Canadian C-Spine rule and extensively discussed in the past [5]. Therefore we did a retrospective study whether non-polytrauma patients benefit from cervical spine x-rays.

Methods:

All patients who received cervical spine x-rays in our emergency unit in 2009 and 2010 were included into this study. Radiology reports, documented injuries as well as trauma mechanisms were analyzed. 1334 patients were found who received cervical spine x-rays. 5 acquisition techniques were used: ap, lateral, inclination, reclination and a spotfilm of the odontoid. Sometimes due to different medical reasons less than these 5 projections were used. 29 patients were excluded from this study as to deficient documentation.

Results:

1305 patients were included into this study. 52 (4%) suffered from an injury of the cervical spine, of these 41 (3,1%) were non-polytrauma patients and consequently further analyzed. The mean age was 47 ± 27 (median 47). The youngest patient was 0,5 years old, the oldest 94 years old. This is shown in figure 1. 63% were male. Trauma mechanisms, e.g., included car accidents, spasms, fights or jumping into flat water as it can be seen in table 1. Only 20% of injuries were related to road traffic accidents. Reported injuries included odontoid fractures, spinous process fractures, transverse process fractures, vertebral arch fractures, vertebral body fractures as well as discoligamental fractures. Moreover discontinued spondylophytes and metastasis were found (table 2). Therapeutic consequences did exist for 22 patients only including operation, immobilization by a collar as well as a halo fixateur.

Discussion:

Found injuries are manifold. The patients´ age varied widely (<1 to 94y). Although the study group was relatively small, it could be demonstrated that injuries to the cervical spine can be caused by many different trauma mechanisms. 3,1% (33%) of analyzed patients presented with cervical spine injuries. In our non-polytrauma study group only 20% of these cervical spine injuries were caused by road traffic accidents. This indicates that car accidents maybe don´t lead to cervical spine injuries as often as feared by trauma surgeons. Different publications suggest, that at least 50km/h-60km/h are needed in car accidents to sustain cervical spine injuries. However, less speed does not exclude damage to the spine. Most times injured non-polytrauma traffic participants only suffer from cervical spine distortions. This indicates the importance of a good structured clinical examination to reduce redundant x-rays. For standardized examination medical doctors should use a scheme like the Canadian C-Spine rule. The mechanism of injury should never be underestimated but also be interpreted together with the clinical examination.

References

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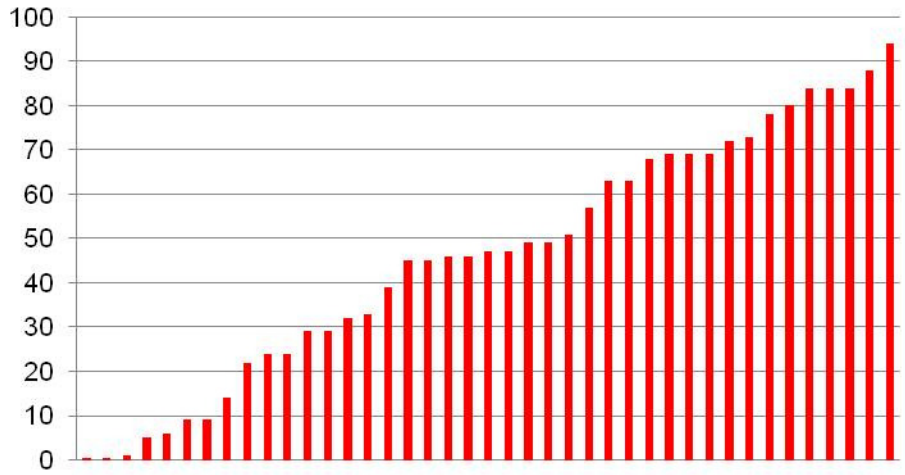
Figures and tables:

Figure 1:



Legend Fig. 1: Age of patients. All patients that were included can be seen on the abscissa. The age can be seen on the ordinate.

Table 1:

Mechanism of injury	Number of patients
dive into flat water	3
fall	19
car accident	6
motorcycle accident	1
fall with tricycle	1
struck by a car	1
sports	1
seizure	1
head impact	1
unknown	6

Table 1: Mechanisms of injury.

Table 2:

Types of injury	Number of patients
fractures of spondylophytes	4
subluxation	5
C2 fracture	7
spinous process fracture	7
discoligamental injury	7
compression fracture	5
occipital condyle fracture	2
burst fracture	2
articular process fracture	1
metastasis	1
transverse process fracture	2
fracture of vertebral arch	2
unclear	1

Table 2: Injury types.