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Cervical Spine Trauma: A Retrospective Study of 121 Cases

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Abstract

Introduction: The incidence of cervical spine trauma is continuously increasing. It can lead to dysfunctions in the body and compromise quality of life. The complications arising from such trauma are major causes of morbidity and mortality. The aim of this study was to review the epidemiological, clinical, and therapeutic aspects of cervical spine trauma in our context. **Materials and Methods:** We conducted a retrospective descriptive study in the neurosurgery department of the CHU (University Hospital) of Conakry from October 2019 to October 2023, focusing on the medical records of patients hospitalized for cervical spine trauma. Results: A total of 173 cases of spinal trauma were collected, with 121 involving the cervical spine, representing 69.23%. Young adults were the most represented group (mean age = 31.92 years), with a male predominance (sex ratio = 2.45). Traffic accidents (47.10%) were the leading cause of trauma in our series. 92.56% of patients were transferred without medical care, and 81.81% were admitted more than 6 hours after the trauma. According to the ASIA scale, classes A and B represented 52.06% and 34.71%, respectively. The injuries primarily affected the lower cervical spine, with 62.80% involving dislocations. 65 out of 121 patients underwent surgery, including 64 anterior osteosyntheses with bone grafting and one case of occipito-axial fixation with steel wire via a posterior approach. Postoperative outcomes were favorable at 18.46%, stable at 81.53%, and had a mortality rate of 53.06%. **Conclusion:** Cervical spine trauma is a devastating event often resulting in severe and lasting disabilities. The quality of pre-hospital care and the timing of surgery significantly influence the outcome of the management.

Keywords

Trauma, Cervical Spine, Dislocation, Vertebral Fractures

1. Introduction

The cervical spine is a complex anatomical structure that plays an important role in balancing the skull and protecting the cervical spinal cord. Its involvement is common in accidents and falls [1]. Cervical spine injuries account for 20% of spinal traumas and are found in 70% of polytrauma cases [2] [3]. The aim of this study was to review the epidemiological, clinical, and therapeutic aspects of cervical spine trauma in our context.

2. Materials and Methods

We conducted a retrospective descriptive study in the neurosurgery department of the Conakry University Hospital, covering the period from October 2019 to October 2023. The study focused on the medical records of patients hospitalized for cervical spine trauma during the study period. Data collection was done using a pre-established data collection form, where we gathered parameters such as age, sex, medical history, clinical data, paraclinical data, and management details.

3. Results

During the study period, we recorded 173 cases of spinal trauma, 121 of which involved the cervical spine, representing 69.23%. The mean age of the patients was 32.8 years ± 15.6. A male predominance was noted, with a sex ratio (M/F) of 2.45.

Table 1. Sociodemographic characteristics.

	Number of Cases	Percentage
Age Range (years)		
<15	11	9.09%
16 - 25	31	25.62%
26 - 40	62	51.23%
41 - 65	12	9.91%
>65	5	4.13%
Sex		
Male	86	71.07%
Female	35	28.92%

Table 2. Medical history and etiologies.

Circumstances of Occurrence	Number of Cases	Percentage
Traffic Accidents	57	47.10%
Falls	21	17.35%
Work Accidents	8	6.61%
Sports Injuries	3	2.47%
Landslides	33	27.27%
Gunshot Injuries	1	0.82%

Table 3. Admission time and mode of transport.

	Number of Cases	Percentage
Admission deadline		
Less than 6 hours	22	18.18%
More than 6 hours	99	81.81%
Mode of transportation		
Medicalized transport	09	7.43%
Non-medicalized transport	112	92.56%

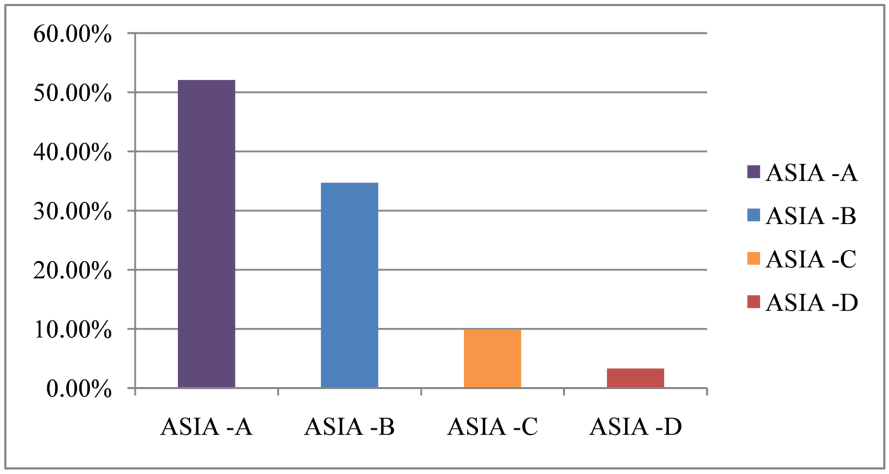


Figure 1. Distribution according to the ASIA scale.

Table 4. Radiological characteristics of the patients.

	Lesion	Number of cases	Percentage
Upper cervical spine involvement	Fracture	6	4.95%
	Dislocation	4	3.30%
Lower cervical spine involvement	Fracture	9	7.43%
	Dislocation	76	62.80%
	Disc herniation	6	4.95%
Others	Spinal cord contusion	8	6.61%
	Decompensated cervical myelopathy	7	3.30%
	Isolated cervical osteoarthritis	5	4.13%

The lesions were mainly located in the lower cervical spine, with a predominance of dislocations (62.80%).

65 (53.71%) of our patients underwent surgery within an average of 11.26 days. We recorded 47 patients who were discharged against medical advice and 9 deaths before surgery.

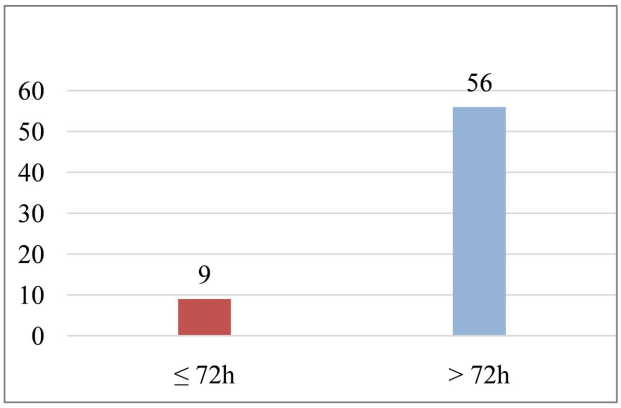


Figure 2. Surgery timing.

64 (98.46%) patients were operated on with an anterior approach, using plate and screw osteosynthesis and bone graft placement, while one patient (1.53%) underwent occipito-axial wiring with steel wires. The outcome was stable in 53 (81.53%) patients and favorable in 12 (18.46%). We recorded 1 (1.53%) case of delayed wound healing, 49 (72.05%) cases of decubitus complications, and unfortunately, 26/49 cases of death, resulting in a mortality rate of 53.06%.

4. Discussion

Out of a total of 173 cases of spinal trauma recorded during our study period, we identified 121 cases of cervical spine trauma. Cervical spine trauma represented 64.28% of spinal trauma cases in Congo, according to Ekouele M. *et al.* [4]. Our results align with literature data and could be explained by the high mobility of the cervical spine compared to other spinal regions [5]-[7]. In our study, young adults were the most commonly affected (51.23% were aged between 26 - 40 years), with a strong male predominance (71.07% and a sex-ratio of 2.45), and an average age of 31.92 years (**Table 1**). Our findings are consistent with those reported by Kpelao *et al.* [8], Motah *et al.* [9], and Bemora J.S. [10], who reported average ages of 37.04 ± 19 and 36.1 years, respectively, with a male predominance of 69.78% (sex-ratio 2.3). This age group, which represents the active population, is therefore more exposed to various forms of accidents and incidents. Thus, traffic accidents (47.10%), landslides (27.27%), falls (6.61%), and work accidents (2.47%) were the main circumstances of occurrence found in our series (**Table 2**).

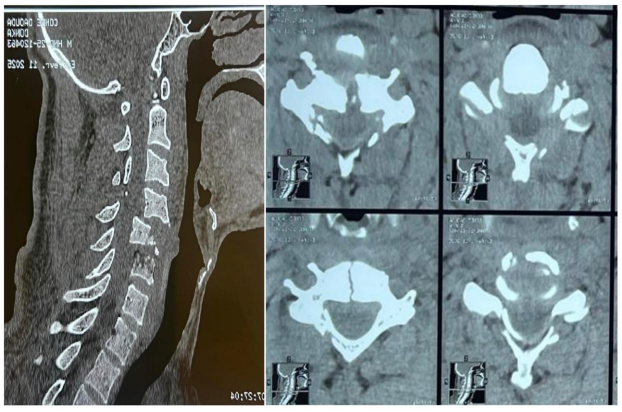
The absence of Level III centers in secondary cities, the delay in patient admission (81.81% of patients admitted more than 6 hours after the trauma) (**Table 3**), and the conditions under which patients were transported (92.56% were transported without medical assistance) are factors that exacerbate initial injuries and influence the clinical condition of patients at admission. Bemora J.S. *et al.* [10] reported that 36.69% of their patients were transported without medical assistance and 31.65% were admitted within 6 hours of the trauma. Indeed, 52.06% and 34.71% of our patients were classified as A and B, respectively, on the ASIA scale (**Figure 1**). In a series covering all vertebro-medullary traumas, Motah *et al.* [9]

reported 58.1% of cases as grade A on the ASIA scale. These results underscore the severity of cervical spine trauma, with the violence of the injuries illustrated by imaging (Graph 1-4).

The lesions found in our series mainly affected the lower cervical spine with 62.80% (Table 4) of cases involving dislocations. This was consistent with the series by Goldberg W. *et al*. [11], who reported involvement of the lower cervical spine in 39.3% of their patients, with frequent involvement at the C6-C7 level.

A total of 65/121 patients were operated on, the majority after more than 72 hours of hospitalization (Figure 2). 64 patients underwent osteosynthesis with bone graft via an anterior approach, while one patient had occipito-axial wiring with steel wires via a posterior approach. Our results could be explained by the financial constraints faced by our patients, in the absence of a state insurance policy that would allow the population to anticipate the management of such unexpected events. This significant factor greatly compromises prognosis and inevitably exposes patients to decubitus complications, which require additional resources for difficult management. In the literature, Loembe *et al*. [12] reported an average surgical delay of 10 - 14 days, while Kpelao *et al*. [8] reported a 83.8% surgical intervention rate. Although the anterior approach was the most commonly performed surgical technique in our series, posterior and circumferential approaches are also used depending on the case [13]. However, these are rarely performed in our context due to the lack of perioperative neuro-navigation, which would allow for a safe and more precise surgical procedure.

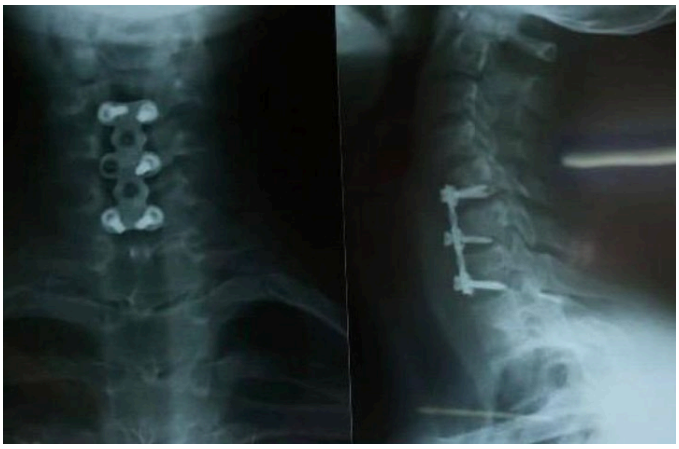
The outcomes were favorable in 18.46%, stable in 81.53%, and complicated by delayed wound healing in 1.53% and decubitus complications in 72.05%, with 26/49 cases of death, representing a mortality rate of 53.06%. The progression of patients after surgery depends on the severity of the lesions, the timing of the care, and the technique used. It is also compromised by the frequency of decubitus complications, which are very common both in developed and developing countries [14] and are one of the leading causes of intra- and post-hospital death. The mortality rate is reported to be 5.6% in developed countries and varies between 7% and 35% in developing countries [4] [15] [16].



Graph 1. Brust fracture of C5 compressing the adjacent spinal cord.

Graph 2. C-spine X-ray showed C5-C6 luxation and distraction stage IV typically resulting from high-energy car accident trauma of the cervical spine in 29 years old male patient.

Graph 3. Odontoid process fracture unstable with a transverse fracture of the base of the dens type II from Anderson and Alonzo classification system.



Graph 4. Wrong-level surgery complication in 25 years old male patient with tetraplegia C5.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Hasler, R.M., Exadaktylos, A.K., Bouamra, O., Benneker, L.M., Clancy, M., Sieber, R., *et al.* (2011) Epidemiology and Predictors of Spinal Injury in Adult Major Trauma Patients: European Cohort Study. *European Spine Journal*, **20**, 2174-2180. https://doi.org/10.1007/s00586-011-1866-7

[2] Agnakhani, N., Vigué, B. and Tadié, M. (1999) Traumatismes de la moelle épinière. Encycl Méd Chir (Elsevier, Paris). Neurologie, 17-685-A-10. 1999.

[3] Amar, A.P. and Levy, M.L. (1999) Surgical Controversies in the Management of Spinal Cord Injury. *Journal of the American College of Surgeons*, **188**, 550-566. https://doi.org/10.1016/s1072-7515(99)00013-7

[4] Ekouele Mbaki, H.B., Boukassa, L., Ngackosso, O.B., KinataBambino, S.B., Elombila, M. and Moyikoua, R. (2017) Prise en Charge Hospitalière des Traumatismes du Rachis Cervical à Brazzaville. *Health Sciences and Disease*, **18**, 43-47.

[5] Jackson, A.B., Dijkers, M., DeVivo, M.J. and Poczatek, R.B. (2004) A Demographic Profile of New Traumatic Spinal Cord Injuries: Change and Stability over 30 Years. *Archives of Physical Medicine and Rehabilitation*, **85**, 1740-1748. https://doi.org/10.1016/j.apmr.2004.04.035

[6] DeVivo, M.J., Rutt, R.D., Black, K.J., Go, B.K. and Stover, S.L. (1992) Trends in Spinal Cord Injury Demographics and Treatment Outcomes between 1973 and 1986. *Archives of Physical Medicine and Rehabilitation*, **73**, 424-430.

[7] Haberer, J.P. (1990) Traumatisme du rachis et des membres. In: Samii, K., Ed., *Anesthésie Réanimation Chirurgicale*, Flammarion, 1082-1097.

[8] Kpelao, E., Diop, A., Beketi, K., Tine, I., Thioub, M., Thiam, A.B., *et al.* (2013) Problématique de la prise en charge des traumatismes graves du rachis cervical en pays sous-développé. *Neurochirurgie*, **59**, 111-114. https://doi.org/10.1016/j.neuchi.2013.04.008

[9] Motah, M., Ndoumbe, A., Kuate, C., Tchakounte Youngui, B., Sende Ngonde, C., Djientcheu, V.D.P., Beyiha, G. and Mouelle Sone, A. (2014) Prise en charge pré-hospitalière des patients victimes de traumatisme vertébro-médullaire en milieu africain. *Health Sciences and Disease*, **15**, 1-6.

[10] Bemora, J.S., Rakotondraibe, W.F., Ramarokoto, M., Ratovondrainy, W. and Andriamamonjy, C. (2017) Aspects épidémiologiques des traumatismes du rachis: À propos de 189 cas. *Pan African Medical Journal*, **26**, Article 16. https://doi.org/10.11604/pamj.2017.26.16.11350

[11] Goldberg, W., Mueller, C., Panacek, E., Tigges, S., Hoffman, J.R. and Mower, W.R. (2001) Distribution and Patterns of Blunt Traumatic Cervical Spine Injury. *Annals of Emergency Medicine*, **38**, 17-21. https://doi.org/10.1067/mem.2001.116150

[12] Loembe, P.M., Akoure-Davin, S., Mwanyombet-Ompounga, L., Koumba, J., Assengone-Zeh, Y., Kouna, P. and Moubeka-Mounguengui, M. (1998) Fractures et luxations du rachis cervical inférieur (C3-C7). Attitudes thérapeutiques au Gabon. *Médecine d'Afrique Noire*, **45**, 630-632.

[13] Dahlan, R.H., Ompusunggu, S.E., Baselim, I.M. and G., Y.R.B. (2019) Cervical Spine Trauma. *Asian Australasian Neuro and Health Science Journal* (*AANHS-J*), **1**. https://doi.org/10.32734/aanhs-j.v1i2.1042

[14] Babatunde, A.S. (2002) Spinal Cord Injuries in Ilorin, Nigeria. *West Africa Journal of Medicine*, **21**, 230-232.

[15] Kawu, K., Adebule, G.T., Gbadegesin, A.A., Alimi, M.F. and Salami, A.O. (2010) Outcome of Conservative Treatment of Spinal Cord Injuries in Lagos, Nigeria. *Nigerian Journal of Orthopaedics and Trauma*, **9**, 21-23. https://doi.org/10.4314/njotra.v9i1.54725

[16] Igun, G.O., Obekpa, O.P., Ugwu, B.T. and Nwadiaro, H.C. (1999) Spinal Injuries in the Plateau State, Nigeria. *East African Medical Journal*, **76**, 75-79.