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Management of Fractures of the Toothed Portion of the Mandible at the Sylvanus Olympio University Teaching Hospital in Lomé (Togo)

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Abstract

Introduction: Fractures of the toothed portion of the mandible can lead to serious functional and aesthetic sequelae if they are poorly treated. The objective of this study was to evaluate the management of these fractures in the Department of Stomatology and Maxillofacial Surgery of the Sylvanus Olympio University Teaching Hospital in Lomé. **Patients and Methods:** This was a retrospective and descriptive study from medical records of patients hospitalized for a fracture involving the toothed portion of the mandible, from January 2015 to December 2022. **Results:** A total of 125 cases of fractures involving the toothed portion of the mandible were collected. The annual frequency was 15.63. The average age of the patients was 31.57 ± 11.60 years, with extremes of 2 years and 68 years. The sex ratio was 4.95. Patients from the informal sector (independent artisans, street vendors, small farmers) accounted for 36.80%. The main etiology was road traffic accidents (75.20%), and involved motorcyclists in 86.17%. The average time before consultation was 48 hours. The mandibular symphysis was involved in 76% of cases, followed by the corpus (20.80%). Fifty-seven point sixty percent of patients had a bifocal fracture. Surgery alone was performed in 66.40% of cases, and mixed orthopedic and surgical treatment was performed in 27.20% of patients (surgical treatment then concerned around 93.60%). The average duration before specific treatment was 12 days. The sequelae were found in 8.80% of patients. **Conclusion:**

Fractures of the toothed portion are the prerogative of young adult males. Their management is surgical and must be early to avoid complications and sequelae. Their etiologies are dominated, in Africa, by road traffic accidents. Emphasis must be placed on prevention.

Keywords

Mandible, Toothed Portion, Fractures, Lome (Togo)

1. Introduction

The toothed portion of the mandible is defined as the region supporting the lower dental arch. It includes the symphysis, the right and left mandibular bodies, and the two angles [1]. A fracture of the toothed portion of the mandible is a bone disruption affecting this portion of the mandibular bone. It constitutes a maxillofacial emergency due to the repercussions on breathing, chewing, speech, and also due to the associated injuries in the context of cranioencephalic trauma. Mandibular fractures are increasingly common and constitute a real public health issue. These injuries are explained by the mobility and anatomical position of the mandible, which acts as a true lower bumper of the face, exposing it to shock during maxillofacial trauma [2]. Fractures of the toothed portion account for approximately 60% to 70% of mandibular fractures [3]. This variability in prevalence is attributable to a set of contributing factors, including the patient's sex, age, environment and socioeconomic situation, as well as the mechanism of trauma. These fractures are the consequence of direct trauma. They are favored by certain predisposing factors, including senile osteoporosis or long-term corticosteroid therapy. They are the prerogative of young subjects [4].

Craniofacial computed tomography remains a beneficial exploration, especially in cases of facial fractures or multiple body trauma. It can be performed regardless of the patient's neurological status [5]. Complications associated with these fractures include dental malocclusions, temporomandibular joint dysfunction, speech and swallowing disorders, nerve damage, and changes in facial aesthetics. The management of these fractures has evolved from stabilization of fractures with steel wires to the use of mini-plates. These fractures are often considered as open due to their association with a tear in the gingival fibromucosa. Their main treatment is osteosynthesis with mini-plates [4] [6]. However, the use of orthopedic procedures is common due to limited financial accessibility for patients in developing countries. The main objective of our study was to evaluate the management of fractures of the toothed portion of the mandible in the Stomatology and Maxillofacial Surgery (MFS) Department of the Sylvanus Olympio (SO) University Teaching Hospital of Lomé.

2. Patients and Methods

We conducted a retrospective and descriptive study from medical records of pa-

tients hospitalized for a fracture involving the toothed portion of the mandible. This study took place from January 2015 to December 2022. We included in this study all patient records who presented with fractures of toothed portion of mandible during the study period. We excluded incomplete and unusable records and patients who were lost to follow-up after treatment. Data collection was conducted using a pre-established survey form. The data collected came from the hospitalized patients' medical records and surgical report registers. We examined sociodemographic data (age, sex, occupation, place of residence, etc.), diagnostic, therapeutic, and outcome data. Statistical analysis was performed using Excel 2019 and Epi info 7.2.5 software. Access to patients' medical records was subject to handwritten authorization from the head of the Stomatology and MFS department of the Sylvanus Olympio University Teaching Hospital and the Director of the SO University Teaching Hospital. Patient anonymity was respected throughout the study. We obtained approval from the Ethics Committee of the Faculty of Health Sciences at the University of Lomé.

3. Results

One hundred and twenty-five (125) patients represented our study sample out of a total of 398 patients hospitalized in the Stomatology-MFS department for maxillofacial trauma during our study period. One hundred and forty-five (155) patients were hospitalized for mandibular fractures, including 136 (34.17%) for fractures involving the dentate portion. Of these, 11 patients were excluded due to incomplete records, and 125 cases of fractures involving the dentate portion of the mandible were retained, representing an annual frequency of 15.63 cases.

The average age of patients was 31.57 years ± 11.60 years, with a range of 2 to 68 years. The most common age group was 20 to 30 years, with 36.00% (n = 45).

One hundred and four patients were male (83.20%), with a sex ratio of 4.95. Of the 125 patients, the informal sector (independent artisans, street vendors, small farmers) was the most common, with 46 cases, or 36.80%. Seventy-eight point forty percent of patients were from Lomé, and only 4.80% were from the interior of the country. Road traffic accidents (RTAs) were the most common cause, with 94 patients, or 75.20%. Motorcycle-motorcycle collision (36.17%) was the most involved mechanism in RTAs. Sixty-three point twenty percent (63.20%, n = 79) of patients were taken to hospital within 24 hours of the trauma. Mandibular signs were dominated by pain (84%) and facial edema (80.80%). Table 1 summarizes the main mandibular clinical signs. Figure 1 shows dental disorder, and Figure 2, mental wound sutured.

Distribution of patient according to displacement

Misalignment was the most common type of displacement found in 26.40% of patients (n = 33). There was no displacement in 35.20% of patients. Table 2 summarizes the distribution of patients by type of displacement. Figure 3 and Figure 4 show on CT-scan, double fracture of symphyseal region of mandible with misaligment, Figure 5 shows on CT-scan a double fracture of mandible associated tooth portion and condylar region.

Table 1. Distribution by mandibular signs.

Signs	Number (n)	Percentage (%)
Mandibular pain	105	84
Facial edema	101	80.80
Dental disorder	81	64.80
Mental wound	39	31.20
Limitation of mouth opening	35	28.00
Tooth mobility	25	20.80
Tooth avulsion	16	12.80
Labio-mental hypoesthesia	01	0.80

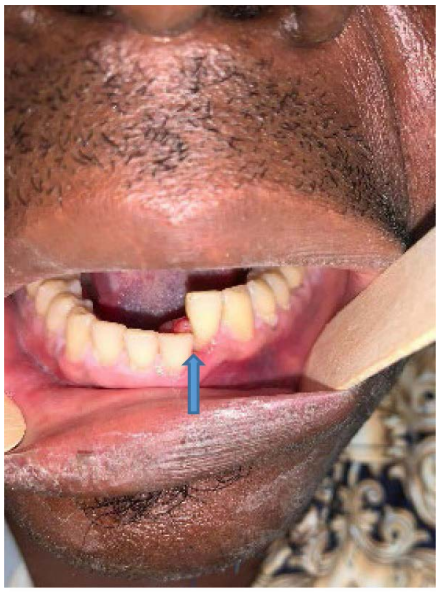

Figure 1. Dental disorder.

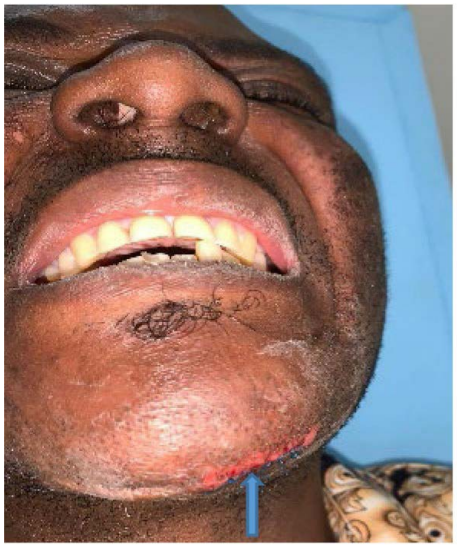

Figure 2. Mental wound.

Table 2. Distribution of patients by type of displacement.

Displasment	Number (n)	Percentage (%)
Misalignment	33	26.40
Overlap	32	25.60
Angulation	10	08.00
Misalignment + Overlap	03	02.40
Misalignment + Angulation	02	01.60
Misalignment + Overlap + Angulation	01	00.80
Total	125	100.00

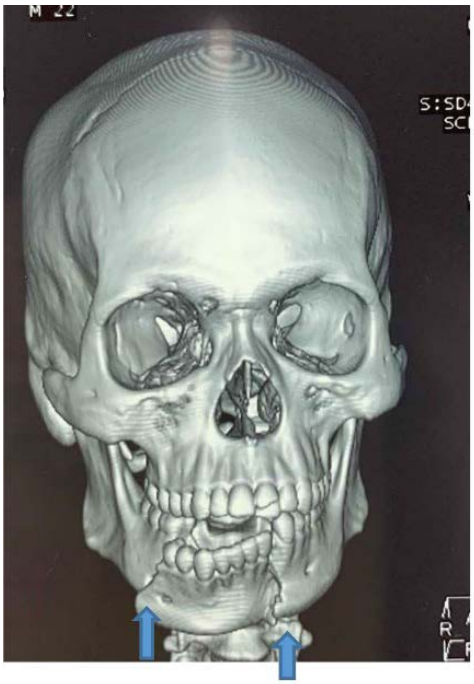

Figure 3. Double fracture of mandible (CT-scan).

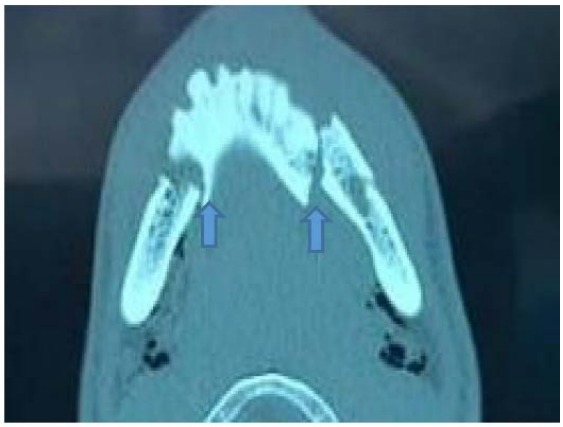

Figure 4. Double fracture of mandible (CT-scan).

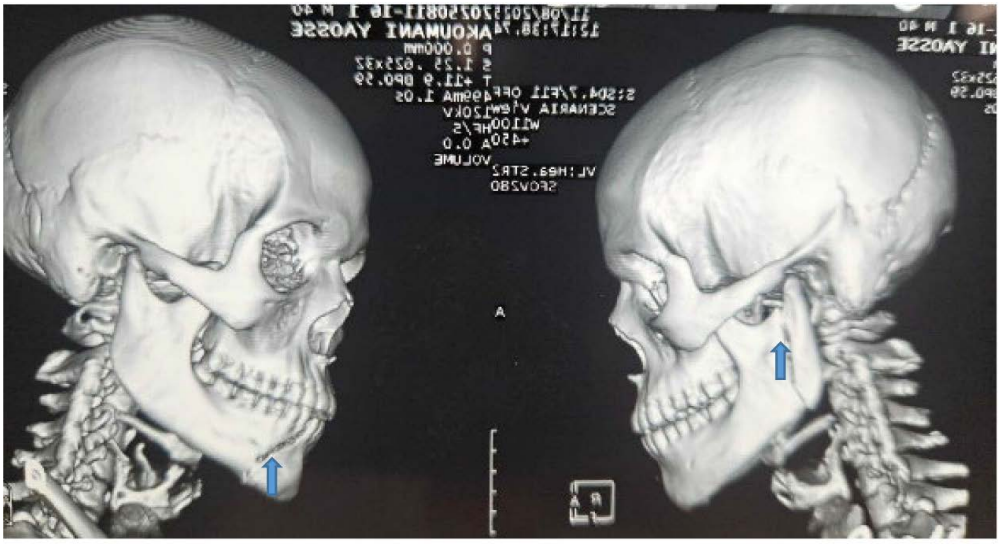

Figure 5. Double fracture of mandible associated tooth portion and condylar area.

Fifty-seven point sixty percent of patients (n = 72) had bifocal fractures, 34.5% (n = 43) had unifocal fractures, and 8% (n = 10) had at least trifocal fractures.

The symphyseal region was most affected in 76% (n = 95), the body in 20.8% (n = 26), the angle in 20% (n = 22), and alveolar-dental fractures represented 14% (n = 18). A combination of fractures of the symphyseal region and angle, of the symphyseal region and alveolar-dental region was found in 14 patients, or 11.20% each, respectively; a combination of the symphyseal region and body in 9.6% (n = 12), and of the body and angle of the mandible in 3.2% (n = 4). Zygomatic fracture was found in 27 patients, or 21.60%; 16 patients (12.8%) had a Lefort fracture and 13 patients (10.4%) a maxillary fracture. Forty patients (32%) had a dentate fracture associated with a fracture of another facial region. Craniofacial CT scan was performed in 108 patients (86.40%).

Patient management required, in all cases, medical treatment, then, depending on the type of fracture and patient means, orthopedic treatment, surgical treatment, or exclusive functional rehabilitation. Ninety-three point sixty percent of patients (n = 117) received general anesthesia and 6.40% (n = 8) received local anesthesia. All patients received medical treatment consisting of analgesics, steroidal anti-inflammatory drugs, antibiotics (amoxicillin + clavulanic acid), and an antiseptic mouthwash. The duration before specific treatment was less than 7 days in 47 patients (37.60%) and more than 14 days in 52 patients (41.60%).

Maxillomandibular block (MMB) with an Ivy ligature was used in 4 patients, MMB with a Dautrey wire in 3 patients (2.4%), and MMB with a quick-release screw in 1 patient (0.8%). Eighty-two patients underwent osteosynthesis with screw-retained miniplates, or 65.50%. The combination of osteosynthesis using screwed mini-plates and interdental steel wire retention was the most commonly used in 10 patients (8%); the combination of screwed mini-plates and MMB on a Dautrey arch in 9 cases (7.2%); and the combination of screwed mini-plates and MMB on an Ivy ligature in 7 cases (5.6%). Osteosynthesis was performed in

93.60% of patients. This treatment concerned both surgical treatment alone (66.40%) (Figure 6) and surgical treatment combined with orthopedic treatment (27.20%) (Figure 7).

The postoperative course was marked by complications in 21 patients (16.80%), including hypoesthesia of the V3 territory (7.20%), surgical site infection (4.8%), and hematoma (4%). Eleven patients experienced sequelae such as tooth loss (6.4%), dental articulation disorder (1.6%), and temporo-mandibular joint disorders (0.8%).

Figure 6. Fracture fixed by plates.

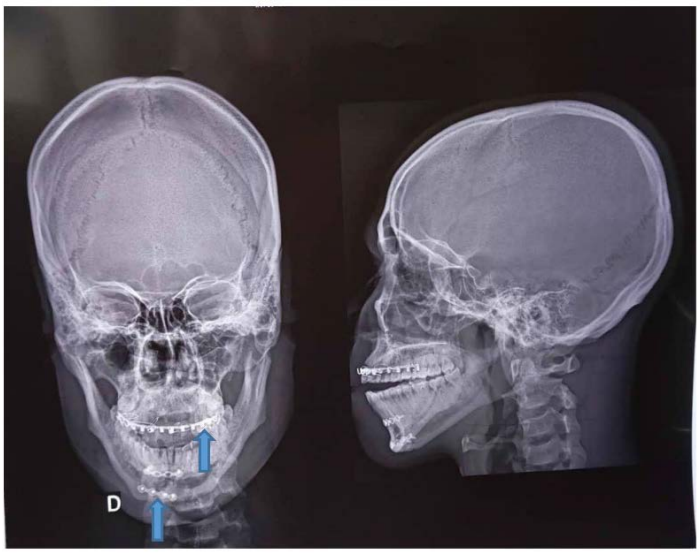

Figure 7. Fracture fixed by plates and Dautrey Arch.

4. Discussion

Our study had limitations due to the retrospective nature of any study, including

the incompleteness of medical records, missing tracking data, which reduced the sample size.

Maxillofacial surgery is a newly established specialty in Togo and a growing field in sub-Saharan Africa. The specialty is little known among hospital practitioners. Previous studies have been conducted on mandibular fractures as a whole, but none specifically on the toothed portion [2]. The most common age group was 20 - 30 years (36%). This age group represents the most active, mobile population, users of motorized vehicles, and exposed to road traffic accidents (RTAs). The main etiology was thus represented by RTAs (75.2%). Data from the African literature agree that RTAs are the leading cause of fractures of the dentate portion of the mandible [7] [8]. Road traffic accidents are caused by precarious transport conditions: motorcycles or cars in poor condition, overloaded passengers, lack of traffic regulations or often lax enforcement of laws, poorly maintained or poor roads, missing road signs. Motorcyclists were involved in 86.17% of RTAs. Bissa *et al.* [9] and Gérard *et al.* [10] noted this involvement in 80.4% and 78% respectively. In France, assaults/fights are the most frequent causes (57%) despite a very developed vehicle fleet [11]. Sixty-three point twenty percent of patients consulted within 24 hours, with an average time before consultation of 48 hours. Tine *et al.* [12] and Gérard *et al.* [10] reported 60.2% and 83.5% of consultations within 24 hours, respectively. Mandibular pain and facial edema were found in 84% and 80.8% respectively. We found dental articulation disorder (64.8%) secondary to displacement, soft tissue injuries (37.1%), limited mouth opening secondary to inflammation or muscle spasm, dental avulsion (12.8%), dental mobility (20.8%) due to damage to the periodontal ligaments, and labiomental hypoesthesia (0.8%) reflecting contusion or inferior alveolar nerve injury. Patients had bifocal fractures in 57.6%. The symphyseal region was the most affected (76%). Our results are similar to those of Pognon *et al.* [7]. On the other hand, Amady *et al.* in Mali [8] reported predominant involvement of the corpus in 19.3%. Sakr *et al.* [13] reported a predominant angle injury in 32.4%. This topographic variability in the literature seems to be linked to the etiology: fights would cause a fracture of the angle and the symphysis, falls a fracture of the corpus and for RTAs a symphyseal injury secondary to high kinetic anteroposterior shocks [14]. The association symphyseal region + condyle (18.4%) was the most represented, followed by that symphyseal region + angle (11.2%). The association symphyseal region + angle was the most represented in the studies of Rocton *et al.* [11] who reported a proportion of 14.2%. These different distributions would be a function of the different mechanisms, knowing that the symphysis, the angle and the condyle constitute the natural weak zones of the mandible. Regarding the association with other facial fractures, 40 patients (32%) were concerned; and that with a zygomatic fracture was the most represented (27 patients), or 21.6%. Our results are superimposable with those of Taiwo *et al.* and Amady *et al.* who reported respectively 40% and 35.1% of associated facial bone lesions [8] [14]. Ebogo *et al.* [3] had found that 64.28% of patients who presented with mandibular trauma had an associated fracture on another region of the face [5]. The diagnosis of a fracture of the dentate portion

of the mandible is based on a careful clinical examination, supplemented by an orthopantomogram, which is the key radiological examination. Computed tomography is an advantageous examination in cases of facial fractures or in a context of multiple trauma. The treatment of maxillofacial fractures remains, for the maxillofacial surgeon, a challenge that requires both dexterity and a high level of skill. Forty-two percent (42%) of patients received specialized treatment within more than 14 days, and 37.6% within 7 days. The average treatment time was 12 days. Orthopedic treatment was performed in 6.4% of cases, surgical treatment in 66.4%, and a combination of the two methods in 27.2%. Osteosynthesis was performed under general anesthesia and orthopedic treatment under local anesthesia. The high rate of osteosynthesis, which offers greater comfort to the patient by avoiding blockages and reducing the duration of disability, could be explained by the availability of implants and the support of universal health insurance, making the cost of patient care affordable. Similar results were reported by Pognon and Rocton [7] [11]. The inadequacy of the technical platform, qualified health personnel and a low socio-economic level could explain the use of orthopedic procedures. The outcome was favorable in 71.4% of cases. Twenty-one patients presented complications: 4.8% surgical site infection and 7.2% hypoesthesia in the territory of the mandibular nerve (V3). Eleven patients presented sequelae. Amady *et al.* found 15.8% sequelae and 7% dysesthesia [8]. Rocton reported 4.8% complications [11].

5. Conclusion

Fractures of the toothed portion are the prerogative of young adult males. Their management is surgical and must be early to avoid complications and sequelae. Their etiologies are dominated, in Africa, by road traffic accidents. Emphasis must be placed on specific prevention, in particular the promotion of the wearing of full-face helmets by all motorcyclists, the wearing of seat belts by motorists, as well as compliance with the road safety code.

Conflicts of Interest

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

References

[1] Frison, L., Larbi, A., Abida, S., Goudot, P. and Yachouh, J. (2013) Mandibular Fractures in 2013. https://www.semanticscholar.org/paper/Fractures-de-la-mandibule-Frison-Larbi/9fccc60e11180dfbf41f8849acf9b8d9f5a12b6b

[2] Mala, A., Ebogo, S.M., Mindja, E., Bombah, F. and Bengondo, C. (2020) Clinical Profile and Treatment of Mandibular Fractures in Yaoundé. *Health Sciences and Disease*, **21**, 52-55. https://www.hsd-fmsb.org/index.php/hsd/article/view/1939

[3] Ebogo, W.M., Okala, P., Ngaba, O., Edouma, J., Bombah, F. and Zogo, P.O. (2020) Clinical and CT Aspects of Mandibular Trauma at Yaoundé Central Hospital. *Health Sciences and Disease*, **21**, 88-90. https://www.hsd-fmsb.org/index.php/hsd/article/view/2364

[4] Delbet-Dupas, C., Pham Dang, N., Mondié, J.-M. and Barthélémy, I. (2013) Blocage maxillo-mandibulaire peropératoire des fractures de mandibule: Arcs ou vis de blocage? *Revue de Stomatologie, de Chirurgie Maxillo-Faciale et de Chirurgie Orale*, **114**, 315-321. https://doi.org/10.1016/j.revsto.2013.07.009

[5] Oral National Council of Teachers of Maxillofacial Surgery and Surgery (2021) Maxillofacial Surgery and Stomatology: Successfully Passing the DFASM—Key Knowledge. 5th Edition, Elsevier Masson, 432 p.

[6] Gupte, S.H., Chaddva, S., Jethwani, Y., Mohandas, A., Kumavat, D.P. and Jhaveri, N. (2016) Evaluation of Efficacy of Three-Dimensional Stainless Steel Mini-Plates in the Treatment of Fractures of the Mandible: A Prospective Study. *Journal of Orthopaedic Case Reports*, **6**, 35-40.

[7] Bancolé Pognon, S.A., Biotchane, I. and Dossou Akpovi, G. (2013) Management of Mandibular Fractures at Saint Luc Hospital in Cotonou (Benin). About 83 Cases. *Oral Medicine Oral Surgery*, **19**, 85-89. https://doi.org/10.1051/mbcb/2013058

[8] Amady, C., Ba, B., Keita, K., Théra, T.D., Tiémoko, C.D. and Diombana, M.L. (2013) Epidemiology of Mandibular Trauma Treated at the Bamako CHU-CNOS: 57 Cases. *African Journal of Dentistry & Implantology*, No. 11, 30-36. https://revues.imist.ma/index.php/AJDI/article/view/15771

[9] Bissa, H., Pegbessou, E.P., Adam, S., Foma, W., Essolam, T., Amana, E., *et al.* (2017) Maxillofacial Trauma at LOMÉ (TOGO): About 501 Cases. *Open Journal of Stomatology*, **7**, 511-518. https://doi.org/10.4236/ojst.2017.712048

[10] Gérard, E.J., Nicole, N.M.O., Adèle-Rose, N.N., Alain, S., and Charles, B. (2021) Epidemiological, Clinical, and Therapeutic Aspects of Mandible Fractures at Yaoun-de Central Hospital. *Health Sciences and Disease*, **22**, 85-89. https://hsd-fmsb.org/index.php/hsd/article/view/2747

[11] Rocton, S., Chaine, A., Ernenwein, D., Bertolus, C., Rigolet, A., Bertrand, J.-C., *et al.* (2007) Mandible Fractures: Epidemiology, Therapeutic Management, and Complications in a Series of 563 Cases. *Revue de Stomatologie et de Chirurgie Maxillo-Faciale*, **108**, 3-10. https://doi.org/10.1016/j.stomax.2006.11.001

[12] Tine, S., Tamba, B., Niang, P., Barry, C., Kébé, N., Guèye, N. (2009) Mandibular Fractures in Dental Practice: A Report of 103 Cases. *MBCB Journal*.

[13] Sakr, K., Farag, I.A. and Zeitoun, I.M. (2006) Review of 509 Mandibular Fractures Treated at the University Hospital, Alexandria, Egypt. *British Journal of Oral and Maxillofacial Surgery*, **44**, 107-111. https://doi.org/10.1016/j.bjoms.2005.03.014

[14] Taiwo, A., Godwin, N., Ibikunle, A. and Soyele, O. (2013) Facial Fracture Management in Northwest Nigeria. *Journal of Surgical Technique and Case Report*, **5**, 65-71. https://doi.org/10.4103/2006-8808.128723