

Characteristics of Maxillary and Mandibular Defects:

Experience of Surgery Departments in Oujda Hospital Centres in Morocco

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Abstract

Introduction: Maxillary and mandibular defects are pathological entities with different etiologies that may be tumoral, traumatic or infectious. They lead to a dysfunction of the maxillofacial system and other functions like phonation, deglutition and mastication without a considerable impact on the aesthetic and the socio-psychological life of patients. **Material and methods:** This is a retrospective study that concerns patients who consulted El Farabi Regional Hospital and Mohammed VI University Hospital of Oujda during the period between 2010 and 2015. The aim of this study is to determine the frequency of maxillary and mandibular defects and to establish their epidemiological and clinical profiles in this region. The collected data were gathered from the clinical files of these patients. **Results:** The study of maxillary defects in Oujda indicate a prevalence of 68.75% with a male predominance (62%) and a mean age of 42 years old. 64.29% of had class II infrastructure maxillary defect according to the Bentahar classification. In the mandible, the prevalence was 31.30%; 53.52% of these mandibular defects were non-interrupted. The defects were mainly caused by tumors. **Conclusion:** The prevalence of maxillo-mandibular defects is highly variable worldwide. The epidemiological, clinical and pathological features in our population of patients are similar to those reported in the literature.

Keywords: Etiology, Maxillary defects, Mandibular defects, Morocco, Prevalence.

1. Introduction

The maxillo-mandibular defects are a result of several etiologies with different physiological and therapeutic consequences. If their frequency has changed during the past three decades, the tumoral cause remains prominent. Considering the polymorphism of the defects, some authors suggested different classifications gathering physiology, surgical treatment and prosthodontic

therapy. The defects are associated to important functional disorders such as: phonatory disorders (related to the communication established between the oral and nasal cavity making speech very difficult), facial asymmetry (with the defects of occlusion in mandibular resections), functional and aesthetic consequences in addition to their psychological impact [1-4]. Our study aimed to determine the prevalence of maxillary and mandibular defects in Oujda hospital centres, as well as establishing their epidemiological and clinical profiles.

2. Material and Methods

This is a retrospective study of patients with maxillary or mandibular defects in the otolaryngology and maxillofacial surgery departments at the Regional and University Hospital Centres of Oujda (El Farabi Regional Hospital Centre , Oujda – Morocco and Mohamed VI University Hospital, Oujda- Morocco), during the period from 2010 to 2015. Data were collected from patient files' records.

Our study was reviewed by our institutional scientific committee and approved by a professional jury members who validated it without finding it necessary to go through an ethics committee since it is a retrospective study. The statistical analysis was performed using SPSS® version 21.0 for Windows. All patients with confirmed diagnosis of mandibular or maxillary defect admitted for surgery were included. We excluded all patients admitted for minor trauma with no associated defect and patients with incomplete files. Thus, 49 files were considered with 45 patients from the Regional Hospital Centre and 4 patients from the University Hospital Centre of Oujda.

RESULTS

In our study, the results showed that **the prevalence of the defects** was respectively 68.75% and 31.30% in the mandible and in the maxilla. Male gender was prominent (62.5%; n= 30). The mean age of patients was 41.2 years old [11- 101]; 41.7% of patients were over 50 years old and 29.2% were under 25 years old. Seventy eight percent lived in urban areas while 21.9%

were from rural areas. Seventy two percent of patients were unemployed, 9.4% were in the public service, 15.6% held liberal positions and 3.1% were retired. In our study, 64.6% consulted within 0 to 6 months. The main complaint was tumefaction and pain, which accounted respectively for 33.3% and 31.3%. Other reasons of consultation were noted: fractures (22.9%), functional disorders (8.3%) and ulcerations (4.2%). The most common cause of defect was tumoral (79.2%) while 20.8% had traumatic origin. Road accidents represented 60% of traumatic aetiology, 30% were victim of aggression and 10% a consequence of ballistic accident. Fifty six percent of patients had parasymphysial mandibular defect and 44.4% had symphysial mandibular defect.

At **the maxillary level**, according to Bentahar classification [2], 64.29% of patients had class II infrastructure maxillary defect, 21.43% had class I infrastructure maxillary defect and 14.29% has class II mesostructure maxillary defect. At **the mandibular level**, according to Benoist classification, 53.5% of patients in our survey had non-interrupted defect while 46.4% had interrupted defect.

Regarding the histological type of the tumour, 55.2% were benign and 44.8% were malignant tumours. Squamous cell carcinoma was the most common histologic type with 66.7% of malignant tumours. For benign tumours, ameloblastoma accounted 64.7% of cases followed by cystic tumours with 17.6%. Other histological types were present namely: fibrous dysplasia (11.8%) and cementoblastoma (5.9%).

The surgical resection was the most chosen approach in the therapeutic strategy with a percentage of 79.4% followed by the combination of radiotherapy and surgery in 11.8%.

The results demonstrated that the age group between 27 and 50 years was predominantly characterized by non-interrupting mandibular defects (46.7%) and conversely, the age group over 50 years was predominantly characterized by interrupting mandibular defects (76.9%).

In the statistical analysis, there was a statistically significant relationship between gender and type of mandibular defect ($p=0.02$) and between age and type of mandibular defect ($p=0.001$).

DISCUSSION

The general overview of the results of our study showed big similarities with data reported in the literature. Mandibular defects were prominent which was similar to the study of Dujonquoy et al. (1995-2010) [5] on primary intra-osseous carcinoma of the maxillary where they found that 8 patients presented mandibular defects while a single patient had a maxillary defect [5]. Our results were compared to those of the Sarakuwa team, who used their classification [6], and the Kreeft and Chigurupati teams [7], who used Brown's classification [8]. These two classifications are in concordance with the Bentahar classification used in our study. Sarakuwa et al. (1992- 2003) in Japan found that 61.79% of cases had maxillary defect class II infrastructure while 11.23% had defect class I infrastructure. In the study of Chigurupati et al. (2002- 2010), 52.17% of patients presented a class II infrastructure maxillary defect [9]. Kreeft et al. (1973- 2009) found that 41% of patients had class II infrastructure maxillary defect and 31% had class II mesostructure maxillary defect [7]. Unlike in other studies, class III infrastructure and mesostructure maxillary defects were not reported in our survey; this may be due to the belated management of patients.

According to Jewer and Boyd classification [10], 46.2% had Class H defects (hemimandibulectomy) followed by 38.5% of cases with class L defect (lateral mandibulectomy), while class C defect (central mandibulectomy) accounted for only 15.4%. In a study on hemi-mandibulectomies in the Czech Republic (1994- 2004), Hoffmannova et al. found that 70.1% of cases had non-interrupted mandibular resections while 29.9% of cases had mandibular interrupting defect [11]. Similarly, in their study on mandible reconstructions in Tanzania in 2006, Simon et al. reported that 64% of patients had non-interrupted mandibular

defect while only 36% had mandibular interrupted defect [12]. According to the **most** of studies, it appears that the non-interruptive mandibular defect is the most frequent encountered type, which can be related to the topography and the localization of the tumour lesions as well as to the fast management of the tumour.

In their work related to the quality of life after maxillectomy and rehabilitation with a prosthetic obturator, Chigurupati et al. (2013) noted a male prevalence with a percentage of 61% [9]. In France, the study conducted by Dujoncquoy and al. at the department of stomatology and maxillofacial surgery of Lille also found a male predominance of 77.8%, while the female gender accounted for only 22.2% [8]. In the Czech Republic, a study by Hoffmannova et al. on hemimandibulectomy between 1994 and 2004 showed that the majority of patients were males with a percentage of 78% [11]. On the contrary, Kreeft and al. showed female predominance with a percentage of 60% against 40% for males [10]. This later result could be explained by the fact that women are much more concerned with their aesthetic appearance than men, which pushes them to consult much more for a prosthetic rehabilitation.

In their study about mandibular vascularized bone flap reconstruction after osteoradionecrosis, Girod et al. (USA; 2004) found that the mean age was 58.7 years old [44- 70] [13]. In Chigurupati et al. study, the mean age was 61 years old [9]. In the study of See and al. on the radial osteo-fascio-cutaneous flap, the mean age of the 10 patients was 60.2 years old [47-84] [14]. The study by Ellis and al. in Texas on the treatment of comminuted mandibular fractures found that the mean age was 30.1 years [12- 60] [13]. In our study, we found that all age groups were seen in the outpatient department with a preferential tendency towards the elderly. This can be explained by the fact that the incidence of the tumours increases with the physiological aging of the tissue structures and the immunosenescence exhibiting elder patients to a great fragility.

According to Bernard et al. (USA; 2008), low incomes and extreme poverty are associated with cancers of the oral cavity and thus with defects [15]. This is in agreement with our results which showed that the socioeconomic level of the treated population was low.

Tagba et al. (Senegal, 2013) noted a mean consultation delay of 5.8 months [3 to 8 months] [16]. In France, in Dujoncquoy et al. study, the mean consultation delay was 6.5 months [8]. In concordance with our results, Tagba et al. in Senegal noted that the most common reason of consultation was tumefaction with a rate of 78.3% [3]. Chigurupati and al. found that 68% of patients reported pain during their consultation [9]. To sum up, it appears that such tumefaction is the most frequent reason for consultation.

The inferiority of the defects in the rural environment compared to the urban environment could be explained by the reduction of risk factors of upper aero-digestive tract cancers in our context in the rural environment because they still have organic and healthy food with a healthy lifestyle. Contrary to our results, Kumar et al. (India, 2013) noted that 56.7% patients were of rural origin [17]. These results may be due to the lack of awareness and access to health services by rural people who only consult at an advanced stage.

Concerning the causes of defects, Kumar and al. also found that tumors were the major etiology (50%) [17]; it was also confirmed in the study of See et al. [14]. In Senegal, Tagda et al. reported five malignancies (21.7%) and 18 benign tumours (78.3%) with a predominance of squamous cell carcinoma and ameloblastoma [16]. In the study by Hoffmannova et al., 82.70% of patients with hemimandibulectomy had malignant tumours [11]. Kayembe and Kalengayi found that squamous cell carcinoma was the most (57.6%) common histological type in the Republic of Kongo (1999) [18]. We infer that squamous cell carcinoma and ameloblastoma remain the most common histological types.

Regarding traumatic causes, Takahiro Kanno et al. study (2010- 2011) showed that 50% of the causes of fractures were accidents in the public roads and the site of predilection was

symphyseal by 41.7% [10]. In our study, 60% of traumatic defects were caused by road traffic injuries.

In Kreeft et al. survey, 31% of patients underwent surgery in association with radiotherapy [12] while it was indicated in only 11% of our patients with most of patients treated with surgical resection. .

Difficulties and limitations of the study:

The study was prospective, we faced some difficulties, namely: the loss of certain clinical data were missed. Also, the defect classifications, since they were based on the description of the intervention as well as the radiological examination, remain not very precise. The non-concordance of the imaging with the clinical situation was an additional difficulty parameter to be taken into consideration.

Conclusion

In conclusion, the epidemiological, clinical and histological characteristics of maxillary and mandibular defects in our population are similar to the data reported in the literature with a predominance of males and tumours and traffic accidents as the main causes of defects.

We also propose some suggestions to better understand maxillary and mandibular defects in Morocco, such as to initiate more studies on a larger sample and in different regions of Morocco, to motivate clinicians to keep detailed and complete records of their patients, to create specialised services in regions more close to the population, and to organise awareness and information campaigns for patients on cancers of the oral cavity.

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Conflict of Interest:

The authors state that there is no conflict of interest with respect to the publication of this article.

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