

Cases Requiring Maxillary Obturator Prostheses Rehabilitation among Patient that Attended Maxillofacial Prosthetic Laboratory, Dental Clinic, LUTH from 2013-2023.

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ABSTRACT

Background: In the course of research work it was observed that after maxillectomy, prosthetic restoration of the resulting defect is the fundamental step because it signals the beginning of patient's rehabilitation.

Aim: The General objectives of this study is to identify the cases requiring maxillary obturator prosthesis, the types of obturator used in the management of the defects and finally to know the causes of maxillary defect among patients that have attended maxillofacial prosthetic Laboratory, Dental Unit at LUTH from 2013-2023.

Methods: In this study, a total number of 75 cases of maxillary defects were seen and the patients' attendance register was accessed with the help of record officers and all data collected were recorded in a datasheet.

Results: The analysis of demographic data pertaining to maxillary cases reveals intriguing patterns regarding gender distribution and religious affiliation. In examining, it becomes evident that within the study period (2013-2023), a total number of 75 maxillary cases were recorded, 35 cases in Females, while Males accounted for 40 cases. This indicates a higher prevalence of maxillary defects among males, Moreover, when considering the yearly prevalence of maxillary cases, it is notable that females consistently exhibited a higher number of maxillary cases compared to males in most years, with the exception of 2019 and 2020. This suggests a potential gender-specific susceptibility to maxillary defects, necessitating subsequent examination into underlying physiological and environmental factors contributing to this disparity. Furthermore, an examination of the types of maxillary defects sheds light on the etiology of these conditions. Congenital defects account for the majority of cases. comprising 54.7% of all cases, followed by traumatic defects at 25.3%, and surgical defects at 20%. Interestingly, while the prevalence of congenital and traumatic

defects appears relatively balanced between Males and Females, with slight variations in percentages, surgical defects exhibit a notable difference, with males comprising a higher percentage compared to Females (20% vs. 11%). This suggests potential gender-specific differences in the nature of maxillary defects, particularly those arising from surgical interventions. Moreover, religious affiliation appears to influence the distribution of maxillary cases, as evidenced by the breakdown of cases among Christians and Muslims. It is observed that Christians accounted for a higher number of maxillary cases (42) compared to Muslims (33) over the study period while the rationale for this inconsistency are not explicitly stated in the data, it may reflect to Prachy variations in healthcare-seeking behavior, genetic predispositions, or socio-economic factors between the two religious groups. Regarding the types of maxillary obturators, the data reveals variations in treatment modalities utilized for maxillary defects. Feeding plates dental emerged as the predominant type of obturator, representing 56% of cases, followed by definitive obturators at 40%, and immediate surgical obturators at 4%. This distribution underscores the importance of tailored treatment approaches based on the nature and severity of the maxillary defect, with feeding plates likely employed for infants or individuals requiring early intervention for feeding difficulties. The result of test of hypothesis using Chi-Square statistical tool shows that there is a relationship between maxillary defects and the use of obturator.

Conclusion: Timely management of these defects with common type of obturator is useful in the practice. It was recommended that dental training and continuous education should be done to practicing dental Technologists.

Keywords: Cases, Maxillary, Obturator, Protheses, Rehabilitation, Patients, Maxillofacial, Prosthetic laboratory and Dental Clinic.

INTRODUCTION

The maxilla is one of the most important structures in the midface, as it separates the oral, antral, and orbital cavities while providing support to the eyes, lower eyelids, cheeks, lips, and nose (Roberto & Joe 2022). Additionally, the maxilla is crucial for speech, swallowing, and chewing, but its defects significantly impact the quality of life (QoL) of patients following surgical resection (Ali, Khalifa & Alhaji, 2018). These defects can lead to difficulties with speech, chewing, and swallowing, while the resulting structural changes may cause facial deformities and psychological effects, ultimately diminishing the patient's QoL. Although, surgical removal of the tumor is the most common treatment for patients with maxillary malignancies (Kolokythas, 2010). This procedure often results in oronasal and/or oroantral defects, leading to significant functional issues with chewing, swallowing, and speech (Jeyaraj, 2018).

Consequently, reconstructing maxillectomy defects presents a significant challenge for head and neck reconstructive surgeons (Mohammad, 2015). Among intraoral defects, maxillary defects are perhaps the most common and can arise from congenital malformations or be acquired following surgical removal of oral tumors. Maxillofacial defects tend to be complex, involving skin, bone, muscle, cartilage, and multiple mucosal layers, making reconstruction challenging and often requiring a multidisciplinary approach for effective patient rehabilitation (James, Jonathan, Simon, 2019).

To address these challenges, a suitable replacement for the lost tissue is essential to restore function and improve QoL (Lethaus et al., 2010). Although in the comprehensive rehabilitation of maxillectomy patients, the maxillofacial prosthodontist has two primary objectives: to restore the functions of chewing, swallowing, and speech, and to achieve a normal orofacial appearance. Prosthodontic rehabilitation of maxillectomy has an advantage over autogenous tissue reconstruction, as it facilitates oncological monitoring (Salinas, 2010). By removing the obturator prosthesis, the surgical site can be easily inspected, allowing for early detection of tumor recurrence (Neelima et al., 2024). An obturator, derived from the Latin term *obturare*, meaning "to close up," is a prosthesis designed to close a palatal defect in either dentate or edentulous patients (Ali et., 2018). It can be a disc or plate, either natural or artificial, used to seal an opening or defect in the maxilla resulting from a cleft palate or partial or total maxillary resection due to tumor removal. According to the

Glossary of Prosthodontics Terms, an obturator is intended to close a congenital or acquired tissue opening, particularly of the hard palate and/or adjacent alveolar structures (Glossary of Prosthodontics, 2017).

The size and location of the maxillary defect also influence the function of the obturator and overall QoL (Neelima et al., 2024). Patients with larger defects often experience greater difficulties when swallowing solid foods and may have issues with fluid regurgitation. This may stem from insufficient retention and stability of the obturator, leading to lower patient satisfaction. Additionally, Reports indicate that many obturator users tend to avoid public appearances and dining out due to challenges with speech clarity, fluid leakage, and food particles adhering to the obturator (Depprich et al., 2011).

METHODS

Research Design/Techniques

Retrospective design was used in which a survey approach was adopted to determine the cases of maxillary obturator prosthesis rehabilitation among patient that attended LUTH Dental clinic in maxillofacial unit from 2013-2022. 75 Cases of maxillary obturator prosthesis rehabilitation among patient that attended LUTH Dental clinic in maxillofacial unit from 2013-2022 form the target population of the study. Sample of 75 patients were used and no sampling technique was employed as the sample size is very small.

Instrument for data collection

Patient’s registration booklet between the period of December 2013 and December 2013. from 2013-2023 were used for data collection and all information gotten was recorded in a specialized data sheet designed for the study. To ensure the validity and reliability of the research instrument, the researcher submitted the data sheet for patients who visited the dental clinic from 2013 to 2023 to her supervisor for review. The patients' register for obturators was accessed with the assistance of record officers, and all relevant information was documented in a data sheet. The data collected were analyzed using Statistical Package for Social Sciences (SPSS) version 23.0 and result were presented in table of frequencies and Percentage.

Ethical Consideration/informed consent

Ethical approval was obtained from the Ethics Committee of the College of Medicine, University of Lagos, as well as from the Head of the Oral and Maxillofacial Prosthetic Laboratory at Lagos University Teaching Hospital (LUTH).

RESULTS

Table 1: Data sheet for Cases of maxillary rehabilitation

S/N	Age	Year	Gender	Types of Obturators	Left/Right	Causes
1	< 15	2013 - 2023	F/M	Feeding plate, Immediate surgical plate and Definitive/Max obturator	Left, Right and both quadrants	Squamous cell carcinoma
2	16- 30	2013 - 2023	F/M	Immediate surgical plate, feeding plate and Definitive/Max obturator	Right, left and both quadrants	Adenocystic carcinoma
3	31- 50	2013 - 2023	F/M	Definitive/Max obturator, surgical plate and feeding plate, immediate	Left, Right and both quadrants	Ameloblastoma
4	51- 60	2013 - 2023	F/M	Feeding plate, immediate and Definitive/Max obturator	Left, Right and both quadrants	Osteoblastoma
5	61- 70	2013 - 2023	F/M	Feeding, definitive obturator plate, Immediate surgical plate	Right, left and both quadrants	Fibrous dysplasia
6	71- 80	2013 - 2023	F/M	Definitive/Max obturator, feeding plate and surgical plate	Left, Right and both quadrants	Juvenile Ossifying Fibroma

Table 1: Distribution by Socio-demographic characteristics of patients, n=75(100%)

Age group (yrs) 2013 - 2023	Frequency(n)	Percentage%
< 15	4	5.3
16- 30	13	17.3
31- 50	37	49.3
51- 60	11	14.7
61- 70	7	9.3
71- 80	3	4
Total	75	100

Table 1a: Demographic Data of the maxillary cases, n=75(100%)

Year	Female	Male	Christian	Muslim	Traditionalist
2013	4	4	6	2	0
2014	1	3	3	1	0
2015	-	4	2	2	0
2016	4	4	4	4	0
2017	6	7	1	12	0
2018	3	-	2	1	0
2019	7	7	13	1	0
2020	4	1	3	2	0
2021	1	3	3	1	0
2022	4	-	2	2	0
2023	1	7	3	5	0
Total	35	40	42	33	0

From Table 1a, it was observed that the Female patients had total number of 35 while male had 40 showing that female counterpart was mostly affected during the course of review and mostly Christians were affected than Muslim religion.

Table 1b: Distribution of Yearly prevalence of maxillary Cases, n=75(100%)

Year	Number of Cases	Male	Female	Percentage
2013	8	4	4	
2014	4	1	3	
2015	4	-	4	
2016	8	4	4	
2017	13	6	7	
2018	3	3	-	
2019	14	7	7	
2020	5	4	1	
2021	4	1	3	
2022	4	4	-	
2023	8	1	7	
Total	75	35	40	100

From table 1b, it was observed that the Female patients had total number of 40 cases while Male had 35 cases indicating that the Female counterpart were mostly affected during the course of review.

Table 2: Distribution by Types of maxillary defects, n=75(100%)

Types of maxillary defects	Frequency	Male	Female	Percentage
Congenital	19	8	11	25.3
Traumatic	41	19	22	54.7
Surgical	15	7	8	20
Total	75	34	41	100

From Table 2, shows the description of the maxillary cases, 41(54.7%) of the cases are traumatic, 19(25.3%) are congenital defect while 15(20%) are surgical defects.

Table 3: Distribution by Types of Maxillary Obturators used in managing the defects, n=75 (100%)

Cases of Obturator	Frequency	Male	Female	Percentage
Feeding plate	42	25	17	56
Immediate surgical plate	3	3	-	4
Definitive/Max obturator	30	7	23	40
Total	75	35	40	100

From the Table 3, it shows that the highest number of maxillary cases treated so far from the year 2013 - 2023 was feeding recording at 42 (56%), followed by definitive obturator with 30(40%) while 4% was for immediate surgical obturator,

Table 4: Distribution by Cases requiring maxillary Obturators, n=75(100%)

Types of cases/lesion	Frequency	Male	Female	Percentage%
Malignant lesion				
Squamous cell carcinoma	43	26	17	57.3
Adenocystic carcinoma	14	6	8	18.7
Benign lesion				
Ameloblastoma	9	6	3	12
Osteoblastoma	5	2	3	6.7
Fibrous dysplasia/juvenile ossifying fibroma	4	3	1	5.3
Total	75	43	32	100

From the Table 4, It was recorded that squamous cell carcinoma having the highest number of the cases with 43(57.3%) and this shows that it is the commonest indication for surgery, followed by Adenocystic carcinoma having 14(18.7%), Ameloblastoma, 9(12%), Osteoblastoma 5(6.7%) and Fibrous dysplasia/juvenile ossifying fibroma 4(5.3%).

Table 5: Association between defects and types maxillary obturators, n=75(100%)

Maxillary defect	Types of maxillary obturators			
	Feeding plate	Immediate surgical plate	Definitive	Total
Congenital	0	0	19	19
Traumatic	31	0	10	41
Surgical	11	3	1	15
Total	42	3	30	75

From the Table 5 above, the association between types of maxillary defects (congenital, traumatic, and surgical) and the types of maxillary obturators used (feeding plate, immediate surgical plate, and definitive obturator) among a sample of 75 patients. The feeding plates are the most frequently used obturators, particularly for traumatic and surgical defects, while definitive obturators are predominantly used for congenital defects. Immediate surgical plates are the least commonly used across all types of defects. Hence, congenital defects are most closely associated with definitive obturators, traumatic defects with feeding plates, while immediate surgical plates have limited association across all defect types.

DISCUSSION

The analysis of demographic data pertaining to maxillary cases reveals intriguing patterns regarding gender distribution and religious affiliation. In examining Table 1b, it becomes evident that within the study period (2013-2023), a total number of 75 maxillary cases were recorded, 35 cases were Female, while 40 cases were Male. This indicates a higher prevalence of maxillary defects among Male. Moreover, when considering the yearly prevalence of maxillary cases, it is notable that Female patients consistently exhibited a higher number of maxillary cases compared to Male patients in most years, with the exception of 2019 and 2020. This suggests a potential gender-specific susceptibility to maxillary defects, necessitating further inquiry into the underlying physiological and environmental factors contributing to this disparity.

Furthermore, an examination of the types of maxillary defects sheds light on the etiology of these conditions. Congenital defects account for the majority of cases, comprising 54.7% of all cases, followed by traumatic defects at 25.3%, and surgical defects at 20%. Interestingly, while the prevalence of congenital and traumatic defects appears relatively balanced between Males and Females, with slight variations in percentages, surgical defects exhibit a notable difference, with Males comprising a higher percentage compared to Females (20% vs. 11%). This suggests potential gender-specific differences in the nature of maxillary defects, particularly those arising from surgical interventions.

Moreover, religious affiliation appears to influence the distribution of maxillary cases, as evidenced by the breakdown of cases among Christians and Muslims. It is observed that Christians accounted for a higher number of maxillary cases (42) compared to Muslims (33) over the study period. While the reasons for this inconsistency are not explicitly stated in the data, it may reflect variations in healthcare-seeking behavior, genetic predispositions, or socio-economic factors between the two religious groups.

Regarding the types of maxillary obturators, the data reveals variations in treatment modalities utilized for maxillary defects. Feeding plates emerged as the common type of obturator, representing 56% of cases, followed by definitive obturators at 40%, and immediate surgical obturators at 4%. This distribution underscores the importance of tailored treatment approaches based on the nature and severity of the maxillary defect, with feeding plates likely employed for infants or individuals requiring early intervention for feeding difficulties.

CONCLUSION

The outcome of this study showed disparities in maxillary defects and treatment outcomes across gender and religious affiliations. Male Patients exhibited a higher prevalence of defects, while Female patients presented a higher number of cases in certain years. Christians accounted for a significantly greater number of cases compared to Muslims, indicating potential socio-cultural influences. Treatment modalities varied, with feeding plates being the most common obturator type. Tailored interventions based on demographic factors and defect type are important for optimizing patient's care and promoting equitable access to treatment services.

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