Original Research Article

Title: Histopathological Patterns of Larynx Biopsies In Usmanu Danfodiyo University Teaching Hospital (UDUTH) Sokoto, North- Western Nigeria From 2002-2012.

ABSTRACT

BACKGROUND: Laryngeal cancer is the most common of the aerodigestive tract affecting both sexes and all age groups with high morbidity and mortality when left untreated.

OBJECTIVES: The study is carried out to review the histology of all larynx biopsies sent to Histopathology laboratory in UDUTH. Sokoto.

METHOD: A total number of forty three (43) paraffin embedded tissue block were used for the study. The blocks were retrieved from the archive and the patients' bio data and the histopathological pattern from the biopsies record book. The sections were cut from the tissue blocks using rotary microtome. They were stained with heamatoxylin and eosin staining technique and the photomicrographs, bio data and histopathological pattern were analyzed and the results were presented in tables as percentages.

RESULT: A total of forty three larynx biopsies were received during the period under review, 17 samples (39.5%) were benign lesions while 26 samples (60.5%) were malignant lesions. The age group with the highest occurrences is 0-9 years which are mostly benign with the malignant having the highest age range of 40-49 years. The male to female ratio 5.5 : 1 and Squamous cell carcinoma has the highest frequency of 92.3% while non Hodgkins lymphoma and Hybrid carcinoma have the lowest frequency of 3.8% respectively.

CONCLUSION: The study showed that there were more benign larynx lesions occurring at the first decade of life while those older age range (40-49 years) are mostly malignant. We recommend awareness for the early detection of these lesions.

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1. INTRODUCTION

Larynx is commonly called the voice box, is an organ in the neck of amphibians, reptiles, and mammals involved in breathing, sound production, and protecting the trachea against food aspiration and manipulates pitch and volume [1]. The larynx houses the vocal folds (vocal cords), which are essential for phonation. The vocal folds are situated just below where the tract of the pharynx splits into the trachea and the esophagus [1]. Laryngeal cancer is the most common cancer of the aero digestive track and it accounts for 20% of all head and neck cancers [2]. The incidence of laryngeal cancer world-wide varies and a number of areas of relative high incidence(>10/100,000) can be identified in Brazil(Sao Paulo),the black populations in parts of the USA, Hong Kong, India (Bombay, Poona), France (Bas Rhins, Doubs), Italy (Varesa), Poland (Katowice), Spain and Switzerland (Geneva) while low incidence areas (<2/100,000) include Japan, Norway, Sweden, New Guinea and Senegal (Dakar) [3]. About 11,300 new cases of laryngeal cancer were to be diagnosed in the year 2007 in the United States which account for about 1% of new cancer diagnosed and approximately one third (3,660) of these patients would die of the disease [2,3]. In the United Kingdom the incidence of laryngeal cancer is approximately four per 100,000 (Intermediate to low incidence) with 70% occurring in men (3-4:1) and the peak incidence between 55 and 65 years [4,5]. Globally the male to female sex ratio for laryngeal cancer is accepted to be 10:1 despite regional variations [2]. One characteristic of laryngeal cancer is its greater predominance in men compared with women. In the USA, the male to female ratio is 4:1, in Canada (Mannitoba), 6:1, and in Italy (Varesa) 32:1where the maximum male to female ratio has been recorded [3]. The etiological factors of laryngeal tumours are cigarette smoking, alcohol, human papiloma virus (strain 16 and18), gastroesophageal reflux, exposure to toxics inhalation such as asbestos, wood dust, formaldehydes and mustard gas among others [6,7]. There are several disorders of larynx that

Comment [7]:
why specific mention of the year 2007 data when the manuscript is being published in 2016. It's better to use generalised data such as "each year ….. number of cases are diagnosed"

can prevent it from functioning optimally. These Acute laryngitis, Presbylarynx, Ulcers, Polyps and nodules, squamous cell carcinoma, verrucous carcinoma, Vocal cord paresis, Idiopathic laryngeal spasm, Laryngopharyngeal reflux. and Laryngomalacia, Laryngeal perichondritis [8,9, 10].

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The diagnosis of larynx disorders includes computerized tomography scan (CT-Scan) which include contrast enhanced helical CT scanning, Magnetic resonance imaging (MRI), Positron emission tomography (PET), physical examination, tissue biopsy and Neck x-ray and fluoroscopy [11,12].

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2.0 MATERIALS AND METHODS

Study Area: This study was carried out in Sokoto State, Nigeria. It is located in the extreme north-western part of Nigeria and it has an estimated population of more than 4.2 million according to 2006 national head count, with an annual average temperature of 38.3°C.

Type of Study: This is a retrospective analysis of all larynx biopsies carried out between January 2002 to December 2012 in a tertiary health facility of Usmanu Danfodiyo University Teaching Hospital Sokoto, Nigeria.

Study Population: The study population included 43 tissue blocks of patients with larynx biopsy from January 2002 to December 2012.

Inclusion and Exclusion Criteria: The inclusion criteria were for patients to have larynx biopsy during the study period. All other patients were excluded in the study..

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excluded from the study

Samples collection and preparation: Demographic data such as age, sex and site of the biopsy were obtained from the patients' histology request cards and histology registers. The paraffinized embedded blocks were traced, recut and stained using haematoxylin and eosin staining method and reviewed for confirmation.

3.0 DATA ANALYSIS

Data obtained was analyzed using EPI INFO VERSION 3.5.4.

40. RESULTS

A total of forty three larynx biopsies were received from January 2002 to December 2012, which amounts to 0.5% of all the biopsies received over that period. Twenty six 26 (60.5%) cases of the larynx biopsies were malignant while benign cases were 17 (39.5%) as shown in table 1 and 2. the mean and median ages of 13.4 years and 10 years respectively.

Table 2 and fig. 8 Show that the sex distribution of the larynx biopsies patients, were 35 (81%) male and 8(19%) female with ratio of 4.4:1

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Table 3 show that among the various histological types observed in benign lesions, granular cell myoblastoma, inflammatory and laryngeal nodule have the lowest occurrence with 5.9% while juvenile papilloma has the highest occurrence with 58.8%. Whereas in malignant lesions, hybrid carcinoma and non hodgkins lymphoma have the lowest occurrence with 3.8% while squamous cell carcinoma has the highest occurrence

Comment [11]: Hodgkin's

TABLE 1: Showing age range, frequency of occurrence of larynx biopsies and their corresponding lesions.

AGE GROUP	BENIGN (%)	MALIGNANT (%)	TOTAL (%)
0-9	8 (47.1)	1(3.8)	9(20.9)
10-19	6(35.3)	0(0.0)	6(13.9)
20-29	0(0.0)	0(0.0)	0(0.0)
30-39	2(11.8)	5(19.2)	7(16.3)
40-49	0(0.0)	6(23.1)	6(13.9)
50-59	0(0.0)	5(19.2)	5(11.6)
60-69	1(5.9)	4(15.4)	5(11.6)
70-79	0(0.0)	3(11.5)	3(6.9)
ε 80	0(0.0)	2(7.7)	2(4.7)
TOTAL	17 (39.5)	26 (60.5)	43 (100.0)

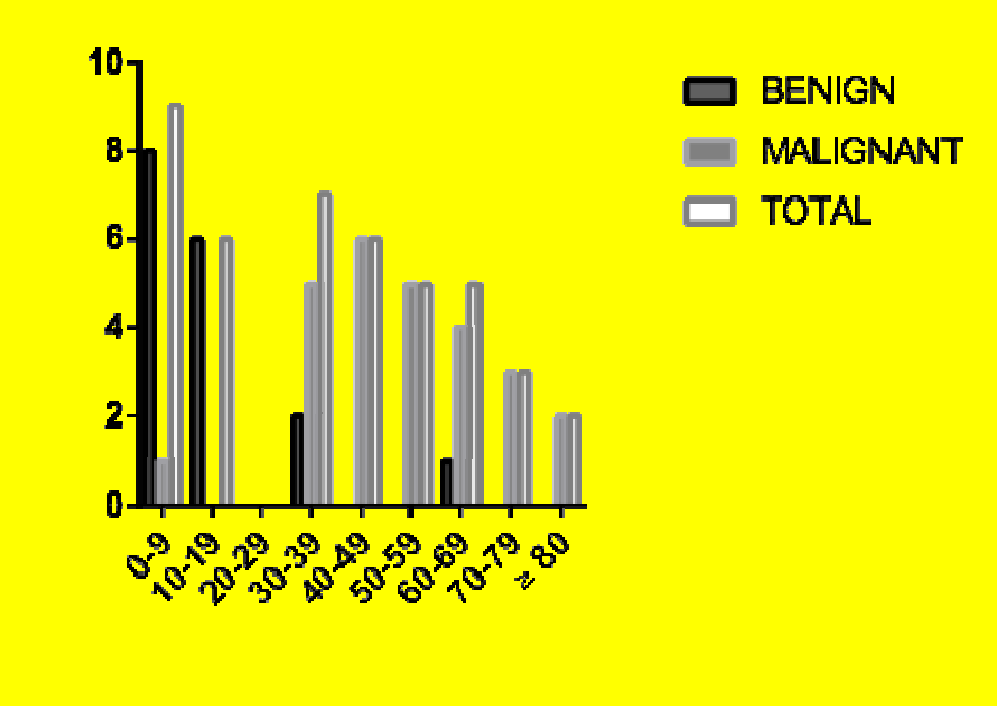

FIG. 7: Showing age range and frequency of their occurrence with their corresponding lesions.

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TABLE 2: Showing genders, benign and malignant cases with their corresponding frequency of occurrence.

	BENIGN (%)	MALIGNANT(%)	TOTAL(%)
MALE	12(75.0)	22(84.6)	35(81.4)
FEMALE	4(25.0)	4(15.4)	8(15.6)
TOTAL	16(39.5)	26(60.5)	43(100.0)

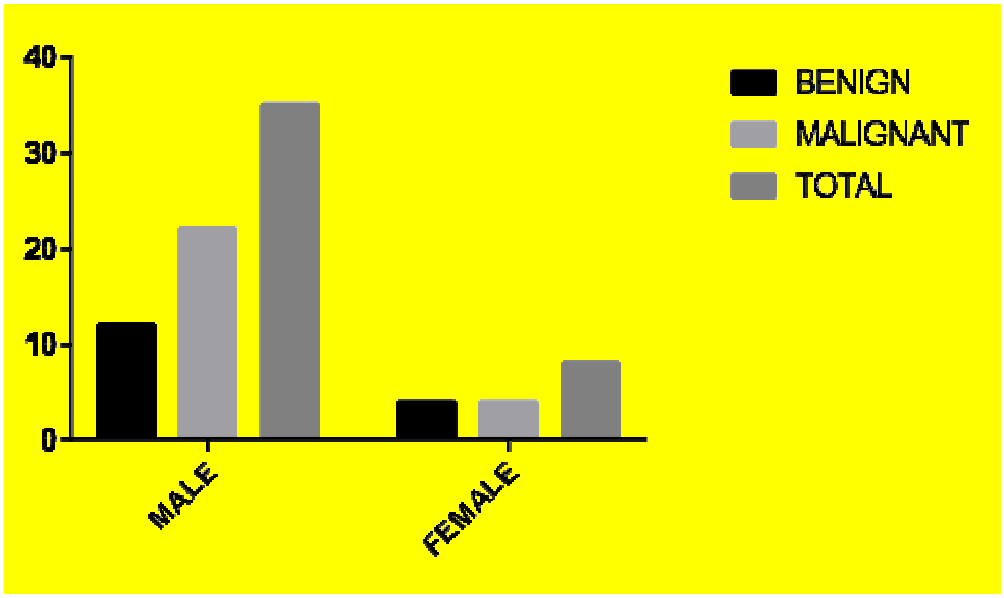

FIG. 8: Showing genders, benign and malignant cases with their corresponding frequency of occurrence.

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TABLE 3: Showing 43 cases and their type of lesions with frequency of occurrence.

Type	Frequency	Percentage	Cummulative Percentage
Benign			
Granular cell myoblastoma	1	5.9%	5.9%
Inflammatory	1	5.9%	11.8%

Juvenile papilloma	10	58.8%	70.6%
laryngeal nodule	1	5.9%	76.5%
Squamous papilloma	4	23.5%	100.0%
Total	17	100.0%	100.0%

Malignant			
Hybrid carcinoma	1	3.8%	3.8%
Non Hodgkins Lymphoma	1	3.8%	7.7%
Squamous cell carcinoma	24	92.3%	100.0%
Total	26	100.0%	100.0%

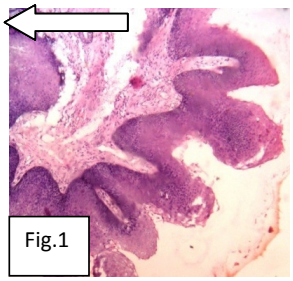

Fig.1

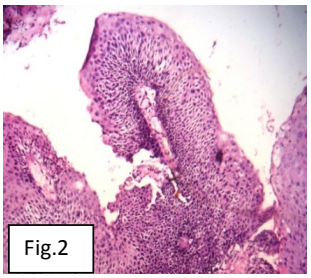

Fig.2

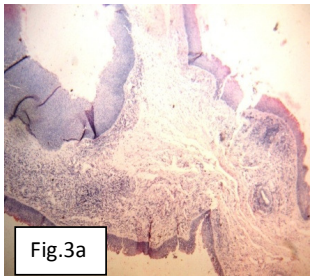

Fig.3a

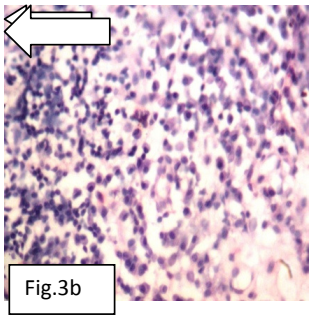

Fig.3b

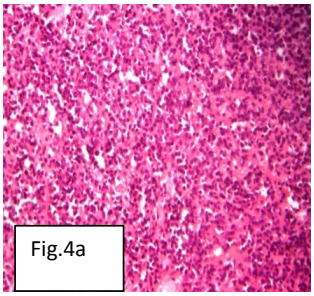

Fig.4a

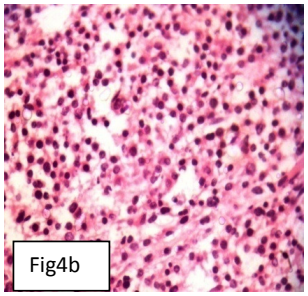

Fig4b

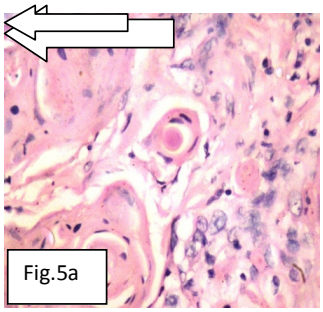

Fig.5a

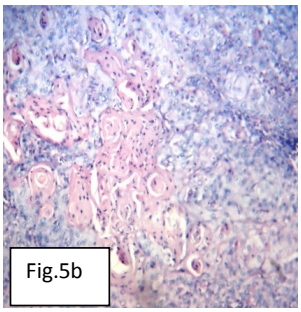

Fig.5b

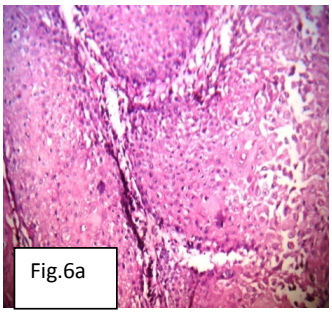

Fig.6a

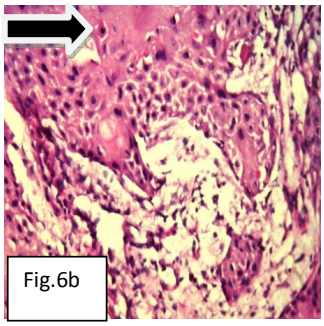

Fig.6b

Figure 1- Photomicrograph of Juvenile papilloma showing papillary acanthotic squamous epithelium. White arrow shows papillary acanthotic squamous epithelium. H & E X100.

Figure 2- Photomicrograph of squamous papilloma showing papillary acanthotic squamous epithelium. White arrow shows papillary acanthotic squamous epithelium. H & E X100

Figure 3a- Photoicrograph of Inflammatory polyp showing numerous inflammatory cells inflitrate in an edematous background. H & E X100.

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Figure 3b- Photomicrograph of inflammatory cells inflitrate , thin arrow shows lymphocyte and thick arrow shows plasma cell , in an edematous background. H & E X 400

Comment [16]: infiltrate

Figure 4a- Photomicrograph of Non Hodgkin's lymphoma showing sheets of tumour cells. H & E X 100.

Figure 4b- Photomicrograph of Non Hodgkin's lymphoma showing sheets of monomorphic tumour cells. H & E X 400.

Figure 5a- Photomicrograph of keratinizing squamous cell carcinoma composed of polygonal and spindle tumour cells with keratin perls (arrow). H & E X 100.

Comment [17]: pearls

Figure 5b- keratinizing squamous cell carcinoma composed of polygonal and spindle tumour cells with keratin perls (arrow). H & E X 400.

Comment [18]: pearls

Figure 6a-Photomicrograph of Verrucous carcinoma with polypoid pattern of growth. H & E X100

Figure 6b- Photomicrograph of Verrucous carcinoma with areas of well differentiated tongues of conventional squamous cell impinge on the underline stroma (arrow). H & E X 400

5.0 DISCUSSION

In this 10 years retrospective study, a total of 43 larynx biopsies samples were received during the period under review. There were 17 cases (39%) of benign lesions and 26 cases (60.5%) of malignant lesions. This study clearly showed that malignant lesions are most occurrences in our environment. Juvenile papilloma is the most commonly occurring benign tumour, out of 17 cases , 10 cases (58%) are juvenile papilloma. There were 26 cases of malignant lesions and the most common histological type is the Squamous cell carcinoma which constitutes 24 cases (92.3%) out of 26 malignant cases. From the age range distribution of patients on the table 1, it was observed that the age groups with the highest frequency was between age range of 0-9 years which account for 20.9% of larynx disorders. Each of this trend is in disagreement with the work of [10] who reported that the peak age range is 50-59years and 30-75years [11]. This study has showed the involvement of lower age groups from third decade of life and one from first decade of life. The reason for this higher affectation of the younger age group in this area and in Nigeria as a whole are not clear but may be attributed to race, genetics, unknown viral infection and nutritional deficiencies in diet and poverty in addition to cigarette smoking and alcohol consumption which are already known strong etiological factors.

It was also observed from table 2 that male account for the 35 cases (81.4%) out of 43 cases of larynx lesions under review.. The general pattern of the distribution of malignant tumours among

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the various age groups is haphazard, as the distribution cut across the entire age groups, from young, middle age and old age.

As indicated from the Table 2, larynx disorders are more common among male gender. It was observed that male account for 81.4% of total larynx disorders among the patients presenting with the condition in Usmanu Danfodiyo University teaching hospital Sokoto. The male to female ratio was 5.5:1. This observation was in agreement with the work [2] who stated that, in the USA, the male to female ratio is 4:1, in Canada (Mannitoba), 6:1, and in Italy (Varesa) 32:1where the maximum male to female ratio has been recorded. [3] in their 15 year study of cases of juvenile papilloma in University College Hospital Ibadan, reported a male to female ratio of 1.9 : 1and a mean age of 8.7years.

Comment [32]: revise

Out of the 26 patients with laryngeal carcinoma, 4(15.4%) were females while 22(84.6%) were found to be males. Generally, laryngeal carcinoma was observed to be more common among the males than females. Globally the male to female sex ratio for laryngeal cancer is accepted to be 10:1 despite regional variations [2].

6.0 CONCLUSION

There were more malignant (60.5%) laryngeal tumours in Sokoto than benign (39.5%) lesions with male preponderance. The prevalent age for malignant lesions was from 35years to 70years which signifies a younger population. The study showed that the most common histological types were squamous cell carcinoma and juvenile papilloma.

The findings in this study raise concern on the burden and management challenges of this cancer in our environment. Therefore it is desirable to educate the public about the disease so that early diagnosis and treatment can make a lot of difference in the morbidity and mortality.

Comment [33]: how does this study raise concern about management challenges.

7.0 RECOMMENDATIONS

1. There is need to improve the socio-economic status of the populace, create awareness for subtle signs and symptoms and have high index of suspicion for early diagnosis and appropriate referral.
2. There is need for public enlightenment on the possibility of high cure rates and voice preservation in early laryngeal cancer.
3. Cost of oncology care should be subsidized by government while an oncology centre should be established in each of the six geopolitical zones in Nigeria.
4. Continuous medical education on early detection and investigation of causes of hoarseness will discourage late presentation.
5. Setting up of more radiotherapy centres

Comment [34]: already made this point in recommendation number 3

6. There is need to educate people, especially those at higher risk, about the nature of the disease and its presenting symptoms.

Comment [35]: similar to first point

7. Recommend Health policy makers in gap analysis and development of strategic interventions for the control of larynx disorders in the region.

8.0 REFERENCES

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Comment [36]: to be corrected

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