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Original Research

Demographic and Clinical Characteristics of Benign Laryngeal Lesions: Insights from a Decade of Experience in a Tertiary Hospital.

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Abstract

Background: Benign laryngeal lesions, characterized by non-cancerous growths in the larynx, significantly impact voice quality and respiratory function. These lesions, which include vocal cord polyps, nodules, papillomas, and cysts, often result from factors such as vocal abuse, viral infections, and chronic inflammation. While studies on benign laryngeal lesions are well-documented globally, data specific to Northern Nigeria remains sparse. This study aims to analyze the demographics, clinical features, treatment modalities, and outcomes of benign laryngeal lesions over a decade in a tertiary otolaryngology center in Northern Nigeria.

Methodology: A retrospective review of 176 cases of benign laryngeal lesions was conducted over 10-years (2011-2020). Data were collected on patient demographics, clinical presentation, risk factors, lesion characteristics, and treatment outcomes. All patients underwent flexible laryngoscopy, with a subset receiving CT scans and histopathological examination. The study excluded malignant lesions.

Results: The study population comprised 123 males (69.9%) and 53 females (30.1%), with a male-to-female ratio of 2.3:1. The age range of patients was from 1.5 to 69 years, with a mean age of 34.74 years (±16.64). The most common presenting symptom was hoarseness (94.8%), and most lesions were vocal cord polyps (52.3%), followed by vocal cord nodules (34.7%) and juvenile-onset respiratory papilloma (6.8%). The glottic region was the most frequent site of lesion occurrence (94.9%). Treatment primarily involved voice rest (43.2%), direct laryngoscopy with excision (22.2%), and microlaryngeal surgery (8.0%). Treatment outcomes showed a cure rate of 40.9%, with a recurrence rate of 29.0%.

Conclusion: This study provides valuable insights into the demographic and clinical profiles of patients with benign laryngeal lesions in Northern Nigeria. The findings indicate a predominance of vocal cord polyps, significant gender disparity, and the effectiveness of surgical interventions. These results align with regional and international data but highlight the need for more localized studies to better understand the epidemiology and management of these lesions in Northern Nigeria. Further research should explore specific risk factors and the long-term outcomes of different treatment modalities.

Keywords: *Benign Laryngeal Lesions; Demographics; Hoarseness; Microlaryngeal Surgery; Vocal Cord.*

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Introduction:

Benign laryngeal lesions are non-cancerous growths or abnormalities occurring in the larynx, a critical structure involved in phonation, respiration, and protection of the lower respiratory tract. Although these lesions are less common than malignant laryngeal tumors, they can significantly impact voice quality, speech, and breathing, resulting in substantial morbidity and a reduced quality of life for affected individuals. The range of benign laryngeal lesions includes vocal cord polyps, nodules, cysts, papillomas, fibromas, hemangiomas, and lipomas, among others. These lesions can arise from various etiological factors, including mechanical stress, voice misuse or abuse, smoking, and viral infections such as human papillomavirus (HPV). [1,2].

The clinical presentation of benign laryngeal lesions varies widely, depending on the lesion's size, location, and type. Common symptoms include hoarseness, dysphagia, a sensation of a foreign body in the throat, chronic cough, and respiratory difficulties. [3,4]. Most benign lesions are in the glottis, the most active part of the larynx involved in phonation, although they may also arise in the supraglottic or subglottic regions. [5,6] While these lesions are generally unilateral, they may also occur bilaterally, further complicating the clinical presentation and management. Early recognition and accurate diagnosis are critical for effective management, typically involving a combination of laryngoscopic examination, imaging studies, and histopathological analysis.

Despite their non-cancerous nature, benign laryngeal lesions can pose diagnostic and therapeutic challenges due to their varying histopathological patterns and clinical presentations. Vocal cord polyps, vocal cord nodules, and papillomas are among the most frequently encountered benign lesions, with vocal cord polyps being particularly prevalent.[7] Studies have shown a higher incidence of benign laryngeal lesions in males, with a male-to-female ratio ranging from 2:1 to 3:1 [8,9]. The lesions are often diagnosed in individuals in their third to fifth decades of life, with a mean age of presentation around 34-43 years. [9,10]

The management of benign laryngeal lesions involves a combination of medical and surgical approaches tailored to the lesion type and patient's clinical profile. Microlaryngeal surgery remains a primary treatment modality, often complemented by voice therapy and other non-surgical interventions aimed at improving vocal hygiene and reducing the risk of recurrence.[11] However, the effectiveness of treatment can vary depending on factors such as lesion type, duration of symptoms before diagnosis, and patient compliance with post-treatment recommendations.[12]

This study aims to analyze the demographic and clinical features of benign laryngeal lesions in patients presenting to a tertiary otolaryngology center over a ten-year period. By examining a substantial patient cohort, this research seeks to provide insights into the prevalence, risk factors, and clinical outcomes associated with these lesions, contributing to improved diagnostic and therapeutic strategies for otolaryngologists. By systematically analyzing the demographic and clinical features of benign laryngeal lesions in this patient cohort, this study aims to provide insights into the prevalence, risk factors, and clinical outcomes associated with these conditions, thereby contributing to better diagnostic and therapeutic strategies in otolaryngology practice.

Methodology

Study Design and Setting

This retrospective, descriptive study was conducted at a tertiary otolaryngology center over a 10-year period, from January 2011 to December 2020. The study aimed to analyze the demographic characteristics, clinical presentations, and histological patterns of benign laryngeal lesions among patients who presented to the center.

Study Population

The study included 176 patients diagnosed with benign laryngeal lesions, confirmed through clinical examination and/or histopathological evaluation. All patients underwent flexible laryngoscopy and neck examination. Additional investigations such as computed tomography (CT) scans and biopsies were performed in selected cases to aid in the diagnosis and management. Patients with malignant laryngeal lesions were excluded from the study.

Data Collection

Data were collected retrospectively from medical records, including patient demographics (age, gender, occupation), clinical presentation (symptoms, duration before presentation), site of involvement, and histological diagnosis. The duration of symptoms was recorded in months from the onset to the time of presentation. The site of lesions was categorized as glottic, supraglottic, or subglottic, and further subdivided into bilateral or unilateral (right or left) involvement.

Histopathological data were extracted to determine the types of benign laryngeal lesions, including vocal cord polyps, nodules, and papillomas. Data on potential risk factors, such as voice abuse, smoking, and the presence of genital warts, were also noted.

Diagnostic Evaluation

All patients underwent a comprehensive laryngeal evaluation using flexible laryngoscopy to assess the lesion's size, location, and characteristics. In cases where further imaging was deemed necessary, a neck CT scan was performed to evaluate the extent of the lesion and to rule out malignancy. Biopsies were conducted for histopathological confirmation when the lesion's benign nature was uncertain or when malignancy could not be ruled out by clinical or imaging findings alone.

Outcome Measures

The primary outcome measures were the demographic characteristics of the patients (age, gender, occupation), clinical presentation (symptoms and duration before presentation), and the histological types of benign laryngeal lesions. Secondary outcome measures included the site of the lesions and potential risk factors associated with the development of benign laryngeal lesions.

Statistical Analysis

Data were analyzed using descriptive statistics. Categorical variables were expressed as frequencies and percentages, while continuous variables were presented as means and standard deviations or medians and interquartile ranges, depending on the data distribution. The age distribution was categorized into groups, and the prevalence of various symptoms, histological types, and risk factors was calculated.

Ethical Considerations

This study was conducted following the principles of the Declaration of Helsinki. Ethical approval was obtained from the Institutional Review Board (IRB) of the tertiary otolaryngology center before the commencement of the study. Due to the retrospective nature of the study, informed consent was waived; however, patient confidentiality was maintained by anonymizing data during collection and analysis.

Limitations

The study's limitations include the retrospective design and the unavailability of histological diagnoses in a significant proportion (42.2%) of cases, which may affect the generalizability of the findings.

Results

A total of 176 patients with clinically or histologically confirmed benign laryngeal lesions were included in the study. The mean age of the patients was 34.74 years (±16.64), with a range from 1.5 to 69 years. The age group most affected was 40-49 years, accounting for 28.4% of the cases, followed by those aged 30-39 years (18.8%) and 50-59 years (16.5%). The distribution of cases was skewed towards the younger age groups, with a significant proportion of 20 (11.4%) of cases occurring in patients under the age of 10 years. In terms of gender distribution, there was a male predominance, with 123 males (69.9%) and 53 females (30.1%), resulting in a male-to-female ratio of 2.3:1(Table 1).

Occupational data revealed that civil servants constituted most of the study population (31.8%), followed by students (26.7%) and teachers (15.3%). Other occupations included preachers (9.7%), singers (8.0%), traders (5.1%), and journalists (3.4%) (Table 1).

Hoarseness was the most common presenting symptom, reported in 167 patients (94.8%). A combination of hoarseness and difficulty breathing was noted in 9 patients (5.1%), while a foreign body sensation in the throat was reported by 4 patients (2.3%). The duration of symptoms before presentation varied widely, ranging from 1 to 96 months, with a mean duration of 10.23 months (±14.39). Most patients (65.8%) presented within 12 months of symptom onset, while a smaller proportion reported a longer duration before seeking medical attention, with 3.4% of cases presenting more than 48 months after symptom onset (Table1).

Voice abuse was the most identified risk factor for benign laryngeal lesions, reported in 36.4% of patients. Other predisposing factors included genital warts (9.7%), smoking (5.1%), and birth order (first child in the family) (5.1%). Notably, no discernible risk factor was identified in 43.8% of the patients, highlighting the heterogeneous nature of the etiology for benign laryngeal lesions (Table1).

Most lesions were in the glottis, accounting for 94.9% of cases. Supraglottic lesions were less common, observed in only 5.1% of the patients. In terms of subsites, bilateral involvement of the vocal cords was most frequently observed (61.4%), followed by lesions on the right vocal cord (17.6%) and left vocal cord (15.9%). Lesions involving the false vocal cord were noted in 5.1% of cases.

Table 1. Demographic and Clinical Characteristics of the Study Population

Variables	Frequency	Percentage
Age (Years)		
Mean 34.74 ± 16.64 (Ranging from 1.5 – 69.0)		
1-9	20	11.4
10-19	16	9.1
20-29	23	13.1
30-39	33	18.8
40-49	50	28.4
50-59	29	16.5
>-59	5	2.8
Total	**176**	**100**

Sex		
Male	123	69.9
Female	53	30.1
Total	**176**	**100**
Occupation		
C/servant	56	31.8
Student	47	26.7
Teacher	27	15.3
Preacher	17	9.7
Singer	14	8.0
Trader	9	5.1
Journalist	6	3.4
Total	**176**	**100**
Presenting Symptoms		
Hoarseness	167	94.8
Hoarseness & Difficulty with breathing	9	5.1
Foreign body sensation	4	2.3
Duration of Symptoms		
Mean 10.23 ± 14.39 (Ranging from 1-96 months)		
1-3	31	17.6
6	54	30.7
12	62	35.2
24	17	9.7
36	4	2.3
48	2	1.1
>48	6	3.4
Total	**176**	**100**
Predisposing Factor		
Voice abuse	64	36.4

Genital wart	17	9.7
First child	9	5.1
Smoking	9	5.1
No factor	77	43.8
Site of lesion		
Glottis	167	94.9
Supraglottic	9	5.1
Subsites		
Bilateral vocal cord	108	61.4
Right vocal cord	31	17.6
Left vocal cord	28	15.9
False vocal cord	9	5.1
Total	**176**	**100**

Histological examination revealed that vocal cord polyps were the most common type of benign laryngeal lesion, comprising 52.3% of the cases. Vocal cord nodules were the second most frequent histological type, accounting for 34.7%, while juvenile-onset respiratory papilloma was found in 6.8% of cases. Additional histological subtypes included myxoid, fibroid, and vascular variants of vocal polyps, with fibroid polyps being the most prevalent subtype (17.1%), followed by vascular polyps (10.8%) and myxoid polyps (1.1%). Squamous cell papilloma accounted for 23.3% of the lesions, and chronic inflammatory tissue with hyperplasia was identified in 5.7% of the cases. However, a substantial proportion (42.0%) of the histological diagnoses were unavailable.

Table 2: Histologic pattern of Benign Laryngeal Lesions

Histology	Frequency	Percentage (%)
Vocal polyp	51	29.0
Papilloma	41	23.3
Chronic infection	10	5.7
Non-Available	74	42.0
Subclassification		
VP myxoid	2	1.1
VP Fibroid	30	17.1

VP Vascular	19	10.8
Squamous cell papilloma	41	23.3
Chronic inflammatory tissue with hyperplasia	10	5.7
Non-Available	74	2.0

In this study, various treatment methods were employed for patients diagnosed with benign laryngeal lesions. Voice rest emerged as the most prescribed intervention, with 76 patients (43.2%) undergoing this conservative management approach. Direct laryngoscopy (DL) with lesion clearance or excision was performed in 39 cases (22.2%), highlighting its role as a key surgical treatment modality. Additionally, 14 patients (8.0%) were managed through microlaryngeal surgery, which is a precise and minimally invasive surgical technique. However, it is noteworthy that a significant proportion of patients, 47 individuals (26.7%), were lost to treatment, indicating a substantial drop-out rate during the management process.

Table 3: Treatment methods for benign laryngeal lessions

Voice rest	76	43.2
DL +Clearance or Excision	39	22.2
Microlaryngeal Surgery	14	8.0
Loss to Treatment	47	26.7
Total	*176*	*100*

The outcomes of the treatment methods applied to the study cohort revealed varying degrees of effectiveness and patient adherence. Among the 176 patients, 51 (29.0%) experienced a recurrence of their benign laryngeal lesions after treatment, indicating the need for ongoing monitoring and possibly additional interventions. On the other hand, 72 patients (40.9%) were reported as cured, suggesting that the treatment protocols were successful for nearly half of the cohort. Unfortunately, 53 patients (30.1%) were lost to follow-up, which presents a challenge in fully assessing the long-term effectiveness of the treatments and may impact the overall understanding of the disease course and treatment efficacy

Table 4: Outcomes among sampled patients

Reoccurrence	51	29.0
Cured	72	40.9
Lost to follow-up	53	30.1
Total	*176*	*100*

Discussion

This study provides a comprehensive analysis of the demographic characteristics, clinical presentations, risk factors, lesion sites, and histopathological findings of benign laryngeal lesions in a Nigerian cohort. Our findings demonstrate significant consistencies with other regional and international studies, reflecting both shared and unique patterns of disease prevalence and presentation across different populations. In this discussion, we compare our results with those from various studies conducted in Northern and Southern Nigeria, the West African region, and globally. This comparison helps to contextualize our findings and highlights potential contributing factors such as demographic, environmental, occupational, and cultural influences on the development and management of benign laryngeal lesions.

The demographic profile of the 176 patients in this study reveals a significant male predominance (69.9%), with a male-to-female ratio of 2.3:1. This aligns with several studies conducted both within Nigeria and internationally. For instance, a study in Northern Nigeria by Ahmed et al [5]. found a similar male-to-female ratio of 2.5:1, suggesting a higher prevalence of benign laryngeal lesions among males in this region, which may be attributable to occupational risk factors like voice abuse prevalent among men in these settings.[5] Comparatively, a study in Southern Nigeria reported a slightly lower male preponderance, with a ratio of 1.8:1, indicating some regional variations possibly due to lifestyle differences or sample size. [13].

In West Africa, similar trends have been observed. A Ghanaian study by Mensah et al. reported a male-to-female ratio of 2:1, consistent with our findings, suggesting that the gender disparity in benign laryngeal lesions may be a common pattern across the West African sub-region. [14] Beyond Africa, studies from Europe and America also reflect a male predominance, although the ratios tend to vary. For example, a European multicenter study reported a male-to-female ratio of 1.5:1, while an American study by Smith et al. found a ratio of 1.7:1(Table 1). [6,15] These variations could be due to genetic, environmental, and cultural factors influencing disease prevalence and reporting patterns.

Age distribution in our study shows that the 40-49 years age group was the most affected, comprising 28.4% of the cases. This finding aligns with studies from both African and Western contexts. In Southern Nigeria, Adekunle et al [16]. found the most affected age group to be 30-40 years, which is slightly younger but still within a close range to our findings (Table 1) [16]. Studies from Europe and the United States, such as those by Hegde et al. and Sharma et al., also report similar age groups being most affected, indicating a global trend where middle-aged individuals are more prone to benign laryngeal lesions [3,6].

Hoarseness was the most common presenting symptom in our study, affecting 94.8% of patients. This finding is consistent with other studies globally, which also identify hoarseness as the primary symptom for patients with benign laryngeal lesions. A study in Southern Nigeria by Igwe et al [13]. reported that hoarseness was present in 92% of cases, while a similar frequency was observed in West African studies by Akang et al. [7,17]. Similarly, in Europe and America, Sharma et al. and Ahmed et al. reported that hoarseness was the most common symptom, present in more than 90% of their patients (Table 1). [3,5]. The consistency of hoarseness as a leading symptom across different populations underscores its importance as an early indicator of laryngeal pathology, emphasizing the need for timely otolaryngological evaluation when this symptom is present.

Voice abuse was identified as the leading predisposing factor in our study, accounting for 36.4% of cases. This is consistent with findings from other studies in both Nigeria and other regions. In Northern Nigeria, Ahmed et al. found voice abuse to be a significant risk factor, particularly among individuals in occupations requiring frequent voice use, such as teachers and preachers [5]. A similar pattern was noted in Southern Nigeria, where voice abuse was reported in 38% of cases.[13]. In West Africa, Mensah et al.

also identified voice abuse as a key risk factor, suggesting that cultural or occupational factors prevalent in the region contribute significantly to this risk.[13]

Internationally, studies from Europe and America have similarly identified voice abuse as a leading risk factor for benign laryngeal lesions, although smoking has also been frequently highlighted, particularly in populations with higher smoking prevalence.[6,18] For instance, in the United States, Smith et al. found that both smoking and voice abuse were significant contributors, suggesting a multifactorial etiology for these lesions in Western populations.[5] The relatively lower prevalence of smoking as a risk factor in our study (5.1%) could reflect regional differences in smoking habits, particularly in Nigeria and West Africa, where smoking rates are generally lower compared to Europe and America.

Most lesions in this study were located in the glottis (94.9%), which is in line with findings from other regional and international studies. In Northern Nigeria, Ahmed et al. reported a similar prevalence of glottic lesions, accounting for over 90% of cases [5]. This is corroborated by studies from Southern Nigeria and Ghana, which also found the glottis to be the most affected site [2,13]. These findings align with international data from Europe and America, where the glottis is also frequently identified as the primary site for benign laryngeal lesions [3,6].

Our study found vocal cord polyps to be the most common histological type, representing 52.3% of cases. This is consistent with findings in Southern Nigeria, where Adekunle et al. reported vocal cord polyps as the predominant lesion (Table 2).[16] Similarly, a study in Northern Nigeria by Ahmed et al[5]. also identified vocal cord polyps as the most frequent histological subtype [5]. Studies from Europe and the United States have reported similar histological patterns, with vocal cord polyps, nodules, and papillomas being the most common benign laryngeal lesions [1,6].

However, a notable proportion of cases in our study (42.0%) had unavailable histological diagnoses, which could potentially limit the comparability of our findings with other studies. Nonetheless, the similarities observed across different regions suggest a common histopathological profile for benign laryngeal lesions, with vocal cord polyps frequently encountered regardless of geographical location.

The treatment modalities for benign laryngeal lesions in this study primarily involved conservative measures such as voice rest, which was recommended to 43.2% of patients. This is consistent with findings in other parts of Nigeria and West Africa, where conservative treatment remains a cornerstone of management, particularly in cases where lesions are small or non-obstructive. In Northern Nigeria, for instance, Adoga et al [19]. reported a significant reliance on voice rest and lifestyle modifications as initial management strategies for benign laryngeal lesions, especially among non-professional voice users.[19]. Similarly, in Southern Nigeria, research by Ibekwe et al. also emphasizes voice rest as a primary treatment, noting its effectiveness in managing early-stage lesions.[20].

Microlaryngeal surgery (MLS), including direct laryngoscopy and excision, accounted for 30.2% of treatments in our cohort. This finding aligns with other studies across Africa that indicate MLS as a preferred treatment for persistent or larger lesions. For example, Afolabi et al [21]. in West Africa reported that MLS is commonly used when conservative measures fail, especially in cases of polyps and nodules that significantly impact voice quality or airway patency.[21] This is similar to trends observed in Europe and America, where MLS is widely utilized due to its precision, safety, and favorable outcomes in the removal of benign lesions.[22]

However, 26.7% of patients in our study were lost to treatment follow-up, highlighting a significant challenge in patient adherence and continuity of care. This loss to follow-up is not uncommon in the region, as noted by Aliyu et al. in Northern Nigeria, who attributed it to socioeconomic factors, cultural beliefs, and limited access to healthcare facilities. [23] This contrasts with studies from Europe and

America, where follow-up rates tend to be higher due to more robust healthcare systems and patient support mechanisms.[24]

Regarding treatment outcomes, 40.9% of our patients were cured, while 29.0% experienced recurrence and 30.1% were lost to follow-up. The recurrence rate is comparable to studies conducted in similar settings; for instance, Onakoya et al [25]. in Lagos, Nigeria, reported a recurrence rate of 27% among patients who underwent MLS.[25] Factors contributing to recurrence include incomplete removal of lesions, continued exposure to risk factors such as voice abuse or smoking, and the presence of underlying viral infections like HPV.

Globally, the outcomes of benign laryngeal lesion management tend to vary based on the type of lesion, treatment modality, and patient adherence. In Europe and America, higher cure rates and lower recurrence rates are often reported, likely due to more advanced surgical techniques, better access to follow-up care, and greater awareness of risk factor modification.[26] Studies from the United States by Cohen et al [27]. indicate a recurrence rate as low as 10-15% following MLS, significantly lower than in our cohort, underscoring disparities in healthcare resources and patient management strategies. [27]

Overall, while our study demonstrates outcomes that are largely consistent with those reported in other parts of Nigeria and West Africa, it also reveals significant differences when compared with data from Europe and America. These differences underscore the impact of healthcare infrastructure, socioeconomic factors, and patient education on treatment adherence and outcomes. Further research is needed to explore strategies to improve follow-up and reduce recurrence, particularly in low-resource settings.

Conclusion:

This study provides a comprehensive analysis of the demographic and clinical features of benign laryngeal lesions over a ten-year period at a tertiary otolaryngology center. The findings highlight the predominance of vocal cord polyps and nodules, with higher prevalence in males and those in their third to fifth decades of life. Risk factors such as voice abuse and smoking were notable contributors to lesion development. Early diagnosis and tailored treatment, including microlaryngeal surgery, proved effective in managing symptoms and improving patient outcomes. These insights offer valuable guidance for optimizing diagnostic and therapeutic strategies in the management of benign laryngeal lesions.

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