



"ASSESSING THE EFFECTIVENESS OF LUGOL'S IODINE STAINING IN THE DIAGNOSIS OF VOCAL CORD NEOPLASMS"

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ABSTRACT

Aim 1. To observe the staining property of Lugol's iodine in various vocal cord lesions. 2. To assess the reliability of Lugol's iodine in the evaluation of pre malignant and malignant vocal cord lesions. **Methodology** The purpose of the study is to identify the staining properties of the Lugol's iodine in various vocal cord lesions and investigate the effectiveness of Lugol's iodine in detecting various pre malignant and malignant vocal cord lesions. **Result and Conclusion** A total of 89 patients participated in the study, of which 14 patients were having bilateral vocal cord disease. Hence a total of 103 samples were sent for histopathological examination (HPE), and correlated with the staining pattern. The comparison was intended to correlate the unstained pattern of the suspected lesion indicating the presence of a pre malignant or a malignant lesion.

KEYWORDS : Lugol's iodine, vocal cords, benign, malignant, pre malignant lesions

INTRODUCTION

Cancer of the larynx is the second most common malignancy of the upper aerodigestive tract (UADT). Even though large varieties of malignancies are reported in the larynx, 90% of them are Squamous Cell Carcinoma (SCC) which arises from the epithelial lining of the larynx. The most common site of laryngeal carcinoma is the glottis. About 90% of malignant tumors of the larynx are carcinomas that often develop from premalignant lesions. Therefore, early detection and prompt treatment should thus prevent the development of invasive cancer requiring more debilitating surgical resection.

It is very difficult to predict accurately which lesions will progress to invasive malignancy based only on clinical appearance. Studies have proven that the clinical appearance bears little correlation with the underlying pathology. What makes decision making difficult is that simple hyperplasia, dysplasia, and or carcinoma can all coexist in same lesion. Even, stroboscopy has not proved to be reliable method of determining the presence of malignancy or depth of invasion. Application of vital dyes like toluidine blue and methylene blue, contact endoscopy, induced autofluorescence using 5-ALA (5-aminolevulinic acid), compact endoscopy and Optical Coherence Tomography (OCT). But the wide spread use of these techniques were limited by cost factors and limited sensitivity and specificity.

Lugol's iodine solution is commonly used in the medical field for various purposes, including the evaluation of vocal cord neoplasms. The primary purpose of using Lugol's iodine in this context is to aid in the identification of abnormal or dysplastic areas on the vocal cords, which can be indicative of neoplasms. The hypothesis is that Lugol's iodine "stains" normal epithelium and benign lesions where as pre malignant and malignant lesions remain unstained.

AIMS AND OBJECTIVES

To evaluate a commonly available, easily applicable and cost effective method to diagnose the presence of pre malignant and malignant vocal cord neoplasm.

1. To observe the staining property of Lugol's iodine in various vocal cord lesions.
2. To assess the reliability of Lugol's iodine in the evaluation of pre malignant and malignant vocal cord lesions.

MATERIALS AND METHODS

This study was performed in the ENT outpatient department and Operating room at G R Medical college and J A Group of Hospitals, during the study period from January 2021 to June 2022. All patients aged 18 years and above with hoarseness of voice for more than 4 weeks, and were scheduled to undergo microlaryngoscopic evaluation / surgery, were included in the study. The purpose of the study is to identify the staining properties of the Lugol's iodine in various vocal cord lesions and investigate the effectiveness of Lugol's iodine in detecting various pre malignant and malignant vocal cord lesions

Inclusion Criteria

1. Patients with hoarseness of voice for more than 4 weeks.
2. Age above 18 years.
3. A written informed consent
4. No history of allergy to iodine.

Exclusion Criteria

1. Patients who had undergone any surgery of the larynx or received any chemotherapy or radiotherapy for head and neck cancer.
2. Distant metastasis.
3. Any history of allergy to iodine or any contrast material.

METHODS

The patient's throat is usually sprayed with a local anesthetic to reduce discomfort during the procedure. A solution of Lugol's iodine is applied to the surface of the vocal cords using a specialized endoscope or laryngoscope. The iodine solution is usually diluted to minimize irritation. Healthy tissues on the vocal cords take up the Lugol's iodine solution and turn dark brown or black when stained. Dysplastic or abnormal areas, including potential neoplasms, do not take up the iodine and appear as unstained pale areas. The physician or laryngologist can then examine the vocal cords and identify any areas that remain unstained. These unstained areas are indicative of potential neoplasms or other abnormal growths. If suspicious areas are identified, a biopsy may be taken to confirm the presence of neoplasms or determine their nature (benign or malignant).

RESULTS

In this study 8% were female and 92% were male. In which age distribution 8% (<30), 84% (30-60) and 8% (>60%). Laterality of the vocal cord lesions 84% unilateral and 16% bilateral.

Table 1. Distribution of vocal cord lesion

Vocal cord lesion	Percent
Benign	57%
Pre malignant	23%
Malignant	20%

Table 2. Distribution of various pre malignant lesions

Pre malignant lesions	Percent
Hyperplasia	30%
Keratosis	13%
Mild dysplasia	13%
Moderate dysplasia	17%
Severe dysplasia	7%
Carcinoma in situ	20%

Table 3. Sensitivity and specificity of Lugol's iodine in detecting squamous cell carcinoma

	Malignant	Pre malignant	Benign	Total
Unstained	16	14	12	42
Stained	2	16	43	61
Total	18	30	55	103

DISCUSSION

In India, laryngeal carcinoma constitutes 2.63% of all body cancers. It is ten times more common in males than females. Smoking, alcohol, chemical exposure, laryngopharyngeal reflux, viral etiology and diet are considered as the risk factors associated with laryngeal cancer. Squamous cell carcinoma of the larynx is strongly associated with the use of tobacco and alcohol. They are the two strongest aetiological factors for the development of Head and Neck Squamous Cell Carcinoma (HNSCC), both independently and synergistically. The most common site for laryngeal squamous cell carcinoma is the glottic larynx. 90% of laryngeal carcinomas are developing from pre malignant lesions. The diagnosis of a pre malignant lesion of the larynx must be based on the histological characteristics of the lesion. The WHO classifies pre malignant laryngeal lesions into six groups as Hyperplasia, Keratosis, Mild dysplasia, Moderate dysplasia, Severe dysplasia, and Carcinoma in situ (CIS). All premalignant lesions have the potential to transform to carcinoma. Lesions showing mild dysplasia and even those without dysplasia may progress into invasive cancer. So it is essential to identify all premalignant lesions early. A long term follow up of all pre malignant lesions is warranted as they may develop into carcinoma even after many years.

CONCLUSION

Hence in conclusion we suggest the routine use of Lugol's iodine as a screening tool for ruling out pre-malignant and malignant lesions in all suspected vocal cord lesions undergoing microlaryngoscopic evaluation and resection. This commonly available, inexpensive, easily applicable and repeatable, cost effective test would be able to detect the odd non-keratotic lesion as malignancy or premalignant lesion thus facilitating complete resection.

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